

REPUBULIKA Y'U RWANDA



**MINISITERI Y'UBUHINZI
N'UBWOROZI**

AJENDA Y'UBUHINZI N'UBWOROZI

2021

Iyi Ajenda yateguwe na Minisiteri y'Ubuhinzi n'Ubworozi

Kalindari y'Umwaka wa 2021

Mutarama - January

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

Gashyantare - February

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |

Werurwe - March

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |

Mata - April

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | | |

Gicurasi - May

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-------|------|-----|------|-----|-----|-----|
| | | | | | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24/31 | 25 | 26 | 27 | 28 | 29 | 30 |

Kamena - June

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | | | |

Nyakanga - July

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | |

Kanama - August

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-------|-------|-----|------|-----|-----|-----|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23/30 | 24/31 | 25 | 26 | 27 | 28 | 29 |

Nzeri - September

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | | | |

Ukwakira - October

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

Ugushyingo - November

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | | | | | |

Ukuboza - December

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|-----|------|-----|------|-----|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 31 | | |

Umwirondoro wa nyirayo

Amazina:

Umudugudu:

Akagari

Umurenge:

Akarere:

Intara:

Serivisi:

Aderesi:

Telefoni (mu biro):

Telefoni (Igendanwa):

E-mail:

Inomero y'Indangamuntu:

Ubwoko bw'amaraso:

Inomero y'ubwiteganyirize bw'abakozi:

Inomero y'uruhushya rwo gutwara ibinyabiziga:

Ajenda y'Ubuhinzi n'Ubworozi 2021

1. Iriburiro
2. Igice cya mbere: **Gahunda na porogaramu za MINAGRI**
3. Igice cya Kabiri: **Calendari**
4. Igice cya Gatatu:
 - i. Kubungabunga ubutaka
 - ii. Kurumbura ubutaka
 - iii. Kuhira Imyaka
 - iv. Gahunda yo gukoresha imashini mu mirimo itandukanye y'ubuhinzi n'ubworozi
 - v. Ubuhinzi bw'ibihingwa ngandura rugo
 - vi. Ubuhinzi bw'imboga
 - vii. Ubuhinzi bw' Ibihingwa ngengabukungu
 - viii. Ubworozi bw'amatungo maremare
 - ix. Ubworozi bw'amatungo magufi
 - x. Paji yo kwandikaho aderesi.

I. Iriburiro

Minisiteri y'Ubuhanzi n'Ubworozi (MINAGRI) ifite mu nshingano kongera umusaruro w'ubuhinzi, ubworozi n'ibikomoka ku matungo hagamijwe kubonera abaturarwanda ibiribwa bihagije, imirire myiza, kugira uruhare mu kuzamura ubukungu no kongera imirimo.

Kugira ngo MINAGRI igere kuri izi nshingano igendera kungamba zinyuranye harimo Politiki y'Ubuhanzi n'Ubworozi; (National Agriculture Policy), Gahunda yo kuvugurura ubuhinzi n'ubworozi (PSTA IV); hifashishwa uburyo buhamye bwo gutanga amakuru, ikoranabuhanga mu kongera umusaruro, no kwegera abahinzi n'aborozi kugira ngo bahinduke abanyamwaga kandi babungabunga ibidukikije.

Izi ngamba zishyirwa mu bikorwa binyuze mu bigo bishamikiye kuri MINAGRI ari byo:

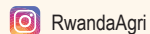
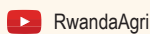
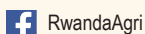
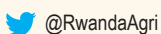
- » Ikigo gishinzwe iterambere ry'Ubuhanzi n'Ubworozi mu Rwanda (RAB)
- » Ikigo gishinzwe iterambere ry'ibyoherezwa mu mahanga bikomoka ku buhanzi n'ubworozi (NAEB).

Muri uyu mwaka wa 2021 MINAGRI inejejeje no kugeza Ajenda y'ubuhinzi n'ubworozi y'umwaka wa 2021 ku bakozi bakora iyamamazabuhinzi, abahinzi, aborozi, abafatanyabikorwa, ba rwiyezamazirimo mu buhanzi n'ubworozi no ku bandi bakozi bitangira guteza imbere ubuhinzi n'ubworozi.

Iyi ajenda y'umwaka wa 2021 ikubiyemo ingingo zikurikira:

- Gahunda y'iyamamazabuhinzi n'izindi gahunda ziyafasha mu iterambere ry'Ubuhanzi n'Ubworozi.
- Aho, nyiri Ajenda azandikamo buri muni ibyo yakoze cyangwa se ateganya gukora ahereye muri Mutarama kugeza mu Ukuboza 2021.
- Amakuru anyuranye y'ubuhinzi n'ubworozi.

Ukeneye ibindi bisobanuro wahamagara kuri 4127



IGICE CYA MBERE:

GAHUNDA NA POROGARAMU ZA MINAGRI

I. GAHUNDA Y'IYAMAMAZABUHINZI: “Twigire Muhinzi”



TWIGIRE MUHINZI ni gahunda y'iyamamazabuhinzi igamije kwegereza abahinzi serivisi z'iyamamazabuhinzi umuhinzi abigizemo uruhare. TWIGIRE MUHINZI ishingiyeye kuburyo bubiri bwuzuzanya bw'iyamamazabuhinzi bukorwa n'abahinzi:

- Uburyo **bw'Abajyanama b'ubuhinzi**” Kora ndebe iruta vuga numve”
- Uburyo bw' Ishuri ry'abahinzi mu mirima (IAMU)” igihingwa ni mwarimu” naho “Umurima ni ishuri”

Ariko hashobora no kwifashishwa n'ubundi buryo bwose bwatuma umuhinzi agera ku musaruro mwiza.

1 Uburyo bw'Ishuru ryo mu murima (IAMU)

"Igihingwa ni mwarimu" naho umurima ni ishuri"

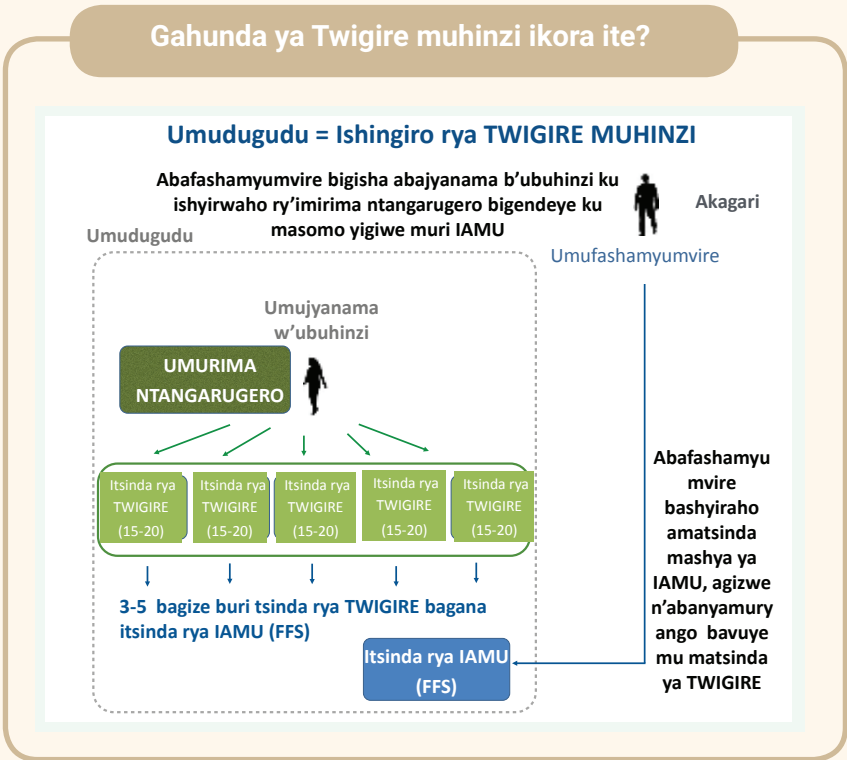


2 Uburyo bw'abajyanama b'ubuhinzi

"Kora ndebe iruta vuga numve"



Gahunda ya Twigire muhinzi ikora ite?



II. GAHUNDA YA LETA Y'UBWISHINGIZI BW'IBIHINGWA

“Tekana Urishingiwe” MUHINZI-MWOROZI

IBIRANGA GAHUNDA Y'UBWISHINGIZI BW'IBIHINGWA

Ishyirwa mu bikorwa na MINAGRI ifatanyije n'ibigo by'ubwishingizi. Yishingira ibihingwa by'umuceri, ibigori, ibirayi, urusenda n'imiteja. Yishingira igishoro umuhinzi ashora mu buhinzi bwe, kuva mu gutegura umurima kugeza imyaka isaruwe. Yishyura ibihombo bituma umuhinzi atabona umusaruro yarategereje biturutse ku ngaruka z'imihindagurikire y'ikirere, indwara n'udukoko birwanywa ntibikire. Ifite nkunganire ya Leta ingana na 40 % by'ikiguzi cy'ubwishingizi, kuri burigihingwa.

AKAMARO KA GAHUNDA Y'UBWISHINGIZI BW'IBIHINGWA

- Bugoboka abahinzi hashyurwa ibihombo bahura nabyo bitateganyijwe.
- ufasha abahinzi kubona inguzanyo mu bigo by'imari zibafasha gushora mu buhinzi bwabo no guhinga kinyamwuga.
- Butanga umutekano w'ishoramari rikorwa mu buhinzi.

NI NDE UHABWA UBU BWISHINGIZI

Ubu bwishingizi buhabwa abahinzi ku giti cyabo, amatsinda n'amakoperative bahinga kinyamwuga mu turere twose tw'igihugu.

NI GUTE UMUHINZI ABONA UBWISHINGIZI BW'IBIHINGWA BYE?

Umuhinzi ukeneye ubwishingizi, agana ibigo bitanga ubwishingizi bifitanye amasezerano na MINAGRI cyangwa akegera agaronome w'umurenge ahingamo akamufasha.

NI GUTE UMUHINZI YISHYURA UBWISHINGIZI

Nyuma yo kumvikana hagati y'umuhinzi n'ikigo cy'ubwishingizi ku buryo bw'imikoranire umuhinzi yishyura 60 % y'ikiguzi cy'ubwishingizi, agahabwa amasezerano agaragaza ko yafashe ubwishingizi, 40 % yishyurwa na Leta.

IBARWA RY'AGACIRO K'IBYISHINGIRWA

Umubare w'amafaranga yishingirwa kuri buri gihingwa ubarwa uherye ku gaciro k'ibikoreshwa byose kugirango umusaruro ugerweho (amafaranga yose y'igishoro). igishoro kiba kigizwe n'amafaranga yose asohoka (Abakozi, imbutu, imiti, ifumbire,...) n'ibindi bitwara amafaranga bifite ibiciro bimenyerewe bidahinduka bijyanye no gukodesha ibikoresho by'ubuhinzi/imashini zikoreshwa mu kurima, guca imirongo, gutabira, gutera, n'indi mirimo isa niyo.

NI GUTE UMUHINZI AMENYEKANISHA IGIHOMBO N'UBURYO BWO KWISHYURA

Iyo umuhinzi agize igihombo yihutira kubimenyesha ikigo cy'ubwishingizi bafitanye amasezerano ndetse n'ubuyobozi bw'umurenge ahingamo. Nyuma yo gupima igihombo cyabayeho, ikigo cy'ubwishingizi cyishyura umuhinzi igishoro yashyanganishije mu gihe kitarenze iminsi 15.

IBYISHINGIRWA NIBITISHINGIRWA

| # | IGIHINGWA | BYISHINGIRIRWA | IBITISHINGIRIRWA |
|---|----------------|---|--|
| 1 | IBIGORI | <ul style="list-style-type: none"> - Imvura nyinshi - Izuba ry'igihe kirekire - Indwara n'ibyonnyi byarwanyijwe ntibikire - Imyuzure - Urubura, Imirabyo, n'umuyaga - Inkongi y'umuriro | <ul style="list-style-type: none"> - imirimo yo mu buhinzi itakozwe n' itakozwe neza, - Umusaruro wangijwe n'inyoni cyangwa inyamaswa - Guuhinga imbuto mbi, - Igihombo gikomoka ku gutinda gusarura, - Igihombo gikomoka k'ubujura, - Igihombo gikomoka ku ntambara - Ibitari mu masezerano, |
| 2 | UMUCERI | <ul style="list-style-type: none"> - Imvura nyinshi - Izuba ry'igihe kirekire - Indwara n'ibyonnyi byarwanyijwe ntibikire - Imyuzure - Urubura, Imirabyo, n'umuyaga - Inkongi y'umuriro | <ul style="list-style-type: none"> - imirimo yo mu buhinzi itakozwe n' itakozwe neza, - Umusaruro wangijwe n'inyoni cyangwa inyamaswa - Guuhinga imbuto mbi, - Igihombo gikomoka ku gutinda gusarura, - Igihombo gikomoka k'ubujura, - Igihombo gikomoka ku ntambara - Ibitari mu masezerano, |

| | | | |
|---|-----------------|--|---|
| 3 | IBIRAYI | <ul style="list-style-type: none"> - Imvura nyinshi - Izuba ry'igihe kirekire - Indwara n'ibyonnyi byarwanyijwe ntibikire - Imyuzure - Urubura,Imirabyo, n'umuyaga - Inkongi y'umuriro | <ul style="list-style-type: none"> - imirimo yo mu buhinzi itakozwe n' itakozwe neza, - Umusaruro wangijwe n'inanyi cyangwa inyamasnwa - Guuhinga imbuto mbi, - Igihombo gikomoka ku gutinda gusarura, - Igihombo gikomoka k'ubujura, - Igihombo gikomoka ku ntambara - Ibitari mu masezerano, |
| 4 | IMITEJA | <ul style="list-style-type: none"> - Imvura nyinshi - Izuba ry'igihe kirekire - Indwara n'ibyonnyi byarwanyijwe ntibikire - Imyuzure - Urubura,Imirabyo, n'umuyaga - Inkongi y'umuriro | <ul style="list-style-type: none"> - imirimo yo mu buhinzi itakozwe n' itakozwe neza, - Umusaruro wangijwe n'inanyi cyangwa inyamasnwa - Guuhinga imbuto mbi, - Igihombo gikomoka ku gutinda gusarura, - Igihombo gikomoka k'ubujura, - Igihombo gikomoka ku ntambara - Ibitari mu masezerano, |
| 5 | URUSENDA | <ul style="list-style-type: none"> - Imvura nyinshi - Izuba ry'igihe kirekire - Indwara n'ibyonnyi byarwanyijwe ntibikire - Imyuzure - Urubura,Imirabyo, n'umuyaga - Inkongi y'umuriro | <ul style="list-style-type: none"> - imirimo yo mu buhinzi itakozwe n' itakozwe neza, - Umusaruro wangijwe n'inanyi cyangwa inyamasnwa - Guuhinga imbuto mbi, - Igihombo gikomoka ku gutinda gusarura, - Igihombo gikomoka k'ubujura, - Igihombo gikomoka ku ntambara - Ibitari mu masezerano, |

Uko ubwishingizi bugura hagendewe ku gishoro

Imbonerahamwe ya mbere (1) iragaraga uko ubwishingizi bugura n'igishoro kuri buri gihingwa.

| # | Ubwoko bw'ubwishingizi | Igihingwa | Igishoro mu mu mafaranga | Ikiguzi cy'ubwishingizi | Ikiguzi cy'ubwishingizi 100% | Uruhare rw'umuhinzi 60% | Nkunganire ya Leta 40% |
|---|---|-----------|--------------------------|-------------------------|------------------------------|-------------------------|------------------------|
| 1 | Ubwishingizi bushingiye ku hantu runaka | Umuceri | 590,320/ha | 7.08 | 41,795 | 25,077 | 16,718 |
| 2 | Ubwishingizi bushingiye ku hantu runaka | Ibigori | 429,250/ha | 8.25 | 35,413 | 21,248 | 14,165 |
| 3 | Iburide | Ibigori | 429,250/ha | 10 | 42,925 | 25,755 | 17,170 |
| 4 | Ubwishingizi bushingiye ku hantu runaka | Urusenda | 2,151,500 | 8 | 172,120 | 103,272 | 68,848 |
| 5 | Ubwishingizi bushingiye ku hantu runaka | Imiteja | 2,018,250 | 8 | 161,460 | 96,876 | 64,584 |
| 6 | Ubwishingizi bushingiye ku hantu runaka | Ibirayi | 2,394,500 | 8 | 191,560 | 114,936 | 76,624 |

III. GAHUNDA YA LETA Y'UBWISHINGIZI BW'AMATUNGO

“Tekana Urishingiwe” MUHINZI-MWOROZI

BIRANGA GAHUNDA YA LETA Y'UBWISHINGIZI KU MATUNGO

- Ishyirwa mu bikorwa na MINAGRI, ifatanyije n'ibigo by'Ubwishingizi.
- Yishingira: Inka, Ingurube n'inkoko.
- Igira nkunganire ya Leta ingana na 40 % ku kiguzi cy'ubwishingizi kuri buri tungo
- Hakoreshwa uburyo bwizewe mu kubarura amatungo yafashe ubwishingizi.
- Uburyo bwo kwishyura no kwishyura itungo ryapfuye buroroshye, kandi hishyurwa agaciro k'itungo ryari rifite igihe ryafataga ubwishingizi.

NI UBUHE BWOKO BW'AMATUNGO BWISHINGIRWA MURI IYI GAHUNDA?

- **INKA:** Inka z'ibyimanyi n'inka z'inzungu
- **INGURUBE:** Ingurube z'ibyimanyi, n'ingurube z'inzungu
- **INKOKO:** Inkoko zitera amagi n'inkoko z'inyama

IKIGUZI CY'UBWISHINGIZI N'INKUNGA YA LETA

- Ikiguzi cy'ubwishingizi kibarwa hashingiwe ku gaciro kari ku isoko ku nka n'ingurube; ku nkoko harebwa agaciro kanini zizagira ariko ntikarenga ibihumbi bitanu (5000Frw).
- Agaciro kagenwa kuburyo bwumvikanyweho n'umworozi, veterineri ubifitiye ububasha n'ikigo cy'ubwishingizi.
- Leta yishyurira umworozi nkunganire ingana na 40% y'ikiguzi cy'Ubwishingizi, umworozi akishyurira 60% by'ikiguzi cy'ubwishingizi.

MINDE UHA UMWOROZI UBWISHINGIZI?

- Ubwishingizi butangwa n'ibigo by'ubwishingizi bibititiye ububasha byatoranyijwe na MINAGRI
- MINAGRI, RAB bikurikirana ishyirwa mu bikorwa ry'iyi gahunda bifatanyije n'inzego z'ibanze

KUMENYEKANISHA ITUNGO RYAPFUYE

- Igihe itungo ripfuye umworozi abimenyesha ikigo cy'ubwishingizi cyamushyize mu bwishingizi akamenyesha na veterineri w'umurenge

- Umworozi ashobora guhamagara kuri numero itishyurwa ya MINAGRI 4127 agahabwa ubufasha.
- Abaveterineri babifitiye ububabasha basuzuma iishe itungo bagakora raporo,
- Abaveterineri bashyikiriza ya raporo ikigo cy'ubwishingizi iherekejwe n'inyandiko yahawe afata ubwishingizi
- Ikigo cy'ubwishingizi gishingira kuri raporo cyahawe niabaveterineri kigakora ubusesenguzi , kigafata umwanzuro ukwiye ukamenyeshwa umworozi mu gihe kitarenze iminsi 15.

IBISABWA UWAFASHE UBWISHINGIZI

- Uwafashe ubwishingizi agomba kugaburira amatungo amatungo ye indyo yuzuye , kuyagiririra isuku, kuyavuzza.
- Mu bumenyi bwe n'ubushobozi agomba gukora ibishoboka akayarinda icyayahungabanya.
- Mu gihe itungo rihuye n'impanuka cyangwa uburwayi umworozi avuzza itungo kuri veterineri ubufitiye ububasha ku mafaranga ye bwite.
- Agomba guhita abimeyesha ikigo cy'ubwishingizi na veterineri w'umurenge iby'iyondwara cyangwa impanuka

IBYISHINGIRWA, IBITISHINGIRWA, IKIGUZI CY'UBWISHINGIZI

| ITUNGO | IBYISHINGIRWA/IBYISHINGIRWA | IBITISHINGIRWA | IKIGUZI CY'UBWISHINGIZI % BY'AGACIRO K'ITUNGO | IKIGEZRO CY'UBUKURE CYO GUFATA UBWISHINGIZI | IGIHE UBWISHINGIZI BUMARA |
|-------------|--|--|---|---|---------------------------|
| INKA | <ol style="list-style-type: none"> 1) Impanuka(inkuba, ibikomere byo ku mubiri no munda, serwakira, kurumwa n'inzoka, imyuzure, inkangu), 2) Ibyorezo 3) Indwara zica ariko zavuwe inka ntikire 4) Itungo ryasabiwe gukurwa mu bworozi bisabwe n'umuganga w'amatungo ubifitanye ububasha. 5) Izapfuye zibyara | <ol style="list-style-type: none"> 1) Uburangare(Kuvuza inka nabi, kuyigaburira ibyateza impanuka, ibyuma, amashashi, uburozi,...) 2) Ubujura 3) Intambara 4) Kwica itungo ubigam-biriye 5) Ikiguzi cy'ubuvuzi igihe inka yarwaye | 4.5 | IMINSI 90(Amazi 3) | Umwaka umwe |

| | | | | | |
|-----------------|---|---|-----|-----------|---|
| INGURUBE | <p>1) Impanuka(inkuba, ibikomere byo ku mubiri no munda, serwakira, kurumwa n'inzoka, imyuzure, inkangu),</p> <p>2) Ibyorezo</p> <p>3) Indwara zica ariko zauwe itungo ntikire</p> <p>4) Itungo ryasabiwe gukurwa mu bworozi bisabwe n'umuganga w'amatungo ubifitiye ububasha.</p> <p>5) Izapfuye zibyara</p> | <p>1) Uburangare(Kuvuza inkabi, kuyigaburira ibyateza impanuka, ibyuma, amashashi, uburozi...)</p> <p>2) Ubujura</p> <p>3) Intambara</p> <p>4) Kwica itungo ubigambiriye</p> <p>5) Ikguzi cy'ubuvuzi igihe inkabyarwaye</p> | 4.5 | IMINSI 30 | Umwaka umwe |
| INKOKO | <p>1) Impanuka(inkuba, ibikomere byo ku mubiri no munda, serwakira, kurumwa n'inzoka, imyuzure, inkangu),</p> <p>2) Ibyorezo</p> <p>3) Indwara zica ariko zavuwe inka ntikire</p> <p>4) Itungo ryasabiwe gukurwa mu bworozi bisabwe n'umuganga w'amatungo ubifitiye ububasha.</p> | <p>1) Uburangare(Kuvuza inkabi, kuyigaburira ibyateza impanuka, ibyuma, amashashi, uburozi...)</p> <p>2) Ubujura</p> <p>3) Intambara</p> <p>4) Kwica itungo ubigambiriye</p> <p>5) Ikguzi cy'ubuvuzi igihe inkabyarwaye</p> | 5.5 | IMINSI 15 | <p>Inkoko z'amagi bumara umwaka umwe</p> <p>Inkoko zinyama bumara iminsi 60</p> |

IV. AMABWIRIZA YA GAHUNDA YA GIRINKA MUNYARWANDA.

Gahunda ya Girinka Munyarwanda yatangiye mu mwaka wa 2006 itangijwe na Nyakubahwa Perezida wa Repubulika y'u Rwanda Paul Kagame.

Muri Gahunda ya Girinka Umuryango worozwa inka itanga umukamo (Calf-Heifer) ukaba ufite **inshingano zo kwitura inyana ya mbere ikomoka ku nka yahawe.**

Gahunda ya Girinka igamije korozwa imiryango ikennye mu rwego rwo kwiteza imbere, kubona amata yo kunywa harwanywa imirire mibi asagutse akaba yagurishwa amafaranga avuyemo agafasha umuryango kwiteza imbere, gutanga ifumbire ikoresha mu buhinzi bityo umusaruro w'ubuhinzi ukiyongera, ndetse ifasha no mu kurwanya isuri haterwa ubwatsi bw'amatungo bufata ubutaka. Iyi gahunda kandi ifasha mu gushimagira imibanire/umubano mwiza mu banyarwanda nk'umuco wo guhana inka mu miryango binyuze mu kugabirana.

Ibisabwa ngo Umuryango worozwe

Imiryango yorozwa muri Gahunda ya Girinka Munyarwanda ingomba kuba yujuje ibi bikurikira:

- 1) Kuba umuryango udafite indi nka n'imwe woroye yaba iyawo cyangwa iyo uragiye;
- 2) Kuba umuryango ufite ubwatsi cyangwa ushobora kububona;
- 3) Kuba umuryango warubatse ikiraro;
- 4) Kuba uyihawe ari inyangamugayo.

Ibimaze kuvugwa muri iyi ngingo, byubahirizwa kandi no mu gihe imiryango igiye korozwa yaba yishyize hamwe mu rwego rw'igikumba rusange.

Guhitamo uhabwa inka bikorwa bite?

Gutoranya abajya ku rutonde rwa Girinka biyoborwa na komite ya Girinka kuri buri rwego, kuva ku rwego rw'umudugudu kugeza ku rwego rw'akarere.

Gutangaza abashyizwe ku rutonde rwa Girinka

Komite ya Girinka kuri buri rwego ikora urutonde rw'abemejwe rukamanikwa ahantu hahurira abantu benshi bitarenze iminsi itatu (3) rumaze kwemezwa.

Kujuririra urutonde

Umuntu wese ujuririra urutonde rwa Girinka abikora mu nyandiko mu gihe kitarenze iminsi itatu (3) urutonde rukimara gutangazwa. Ubujurire bushyikirizwa komite ya Girinka ku rwego rwisumbuye igomba gusubiza uwajuriye mu gihe kitarenze iminsi itanu (5) ibarwa uhereye igihe ubujurire bwakiriwe.

Urutonde rwa Girinka rwemejwe na komite ya Girinka ku rwego rw’akarere ni ndakuka kandi ntirushobora kujuririrwa.

Gutombora

Imiryango yose iri ku rutonde ndakuka rwa Girinka inganya amahirwe yo korozwa inka. Kugena uko imiryango izakurikirana mu korozwa bikorwa mu buryo bwa tombora hakurikijwe urutonde rwa buri mudugudu. Komite ya Girinka ku rwego rw’umurenge iyobora ikanagena aho tombora izabera. Urutonde rw’uko imiryango izorozwa ikurikirana rugomba guhita rutangazwa tombora ikirangira, bigakorerwa inyangikomvugo.

Gushyigikira Gahunda ya Girinka Munyarwanda

Uwifuzza koroza umuryango ukennye wese muri gahunda ya Girinka Munyarwanda yandikira Ubuyobozi Bukuru bwa RAB cyangwa Ubuyobozi bw’Akarere agaragaza ko yifuzza gushyigikira Gahunda ya Girinka Munyarwanda, kugira ngo urwo Rwego rwa Leta rufite iyo Gahunda mu nshingano rugire uruhare muri icyo gikorwa, rushingiye ku bikubiye muri aya mabwiriza.

Ingengabihe

| Igikorwa | Igihe |
|----------------------------|---|
| Kwemeza urutonde | Bitarenze Nyakanga buri mwaka |
| Gutegura aborozi | Nyakanga-Nzeri n’igihe cyose bibaye ngombwa |
| Kurobanura no gutanga inka | Kuva mu kwezi kwa Nzeri –Mata buri mwaka |
| Gukurikirana inka zatanzwe | Kuva muri Nyakanga- Kamena buri mwaka |

IGICE CYA KABIRI:

KALINDARI Y'UMWAKA WA 2021

MUTARAMA 2021

Muri uku kwezi, Imirimo y'ingenzi ikorwa ni iyi ikurikira:

- Gusarura ibihingwa byatewe mu gihembwe cy'ihinga A nk'ibishyimbo, Soya, Ibigori, Ingano, Umuceri, Ibirayi, Imyumbati n'urutoki
- Gutunganya umusaruro w' ibishyimbo, Soya, Ibigori, Ingano, Umuceri, Ibirayi, Imyumbati n'urutoki
- Guhunika ibishyimbo, Soya, Ibigori, Ingano, Umuceri, Ibirayi, Imyumbati n'urutoki

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- Gutegura imirima izahingwamo ibishyimbo, Soya, Ibigori, Ingano, Umuceri n'Ibirayi
- Gutegura amafumbire azakoreshwa batera ibishyimbo, Soya, Ibigori, Ingano, Umuceri n'Ibirayi
- Gutera imbuto y'ibishyimbo, Soya, Ibigori, Ingano, Umuceri n'Ibirayi

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WERURWE 2021

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- Gutabira no gutera Ibigori, ibishyimbo, Soya, Ingano, Umuceri n'ibirayi.
- Kubagara bwa mbere Ibigori, ibishyimbo, Soya, Ingano, Umuceri n'ibirayi.

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- Kubagara bwa kabiri Ibigori, Ibishyimbo, Soya, Ingano, Umuceri, Ibirayi
- Gusukira no gushyiraho ifumbire mvaruganga ku Ibigori, Ibishyimbo, Soya, Ingano, Umuceri, Ibirayi
- Kurwanya indwara n'ibyonnyi by' Ibigori, Ibishyimbo, Soya, Ingano, Umuceri, Ibirayi

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GICURASI 2021

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- Gutegura imirima yo mu bishanga no gutera imboga
- Kufira imboga
- Kurwanya indwara n'ibyonnyi byo mu mboga
- Gutegura aho gusarura no guhunika umusaruro w' Ibigori, ibishyimbo, Soya, Ingano, Umuceri n'ibirayi

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3 KU WA MBERE

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4 KU WA KABIRI

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5 KU WA GATATU

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6 KU WA KANE

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7 KU WA GATANU

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Handwriting practice lines consisting of 20 horizontal dotted lines.

5
2021

| Mon | Tue | Wed | Thu | Fri | Sat | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | | | | |

8 KU WA GATANDATU

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9 KU CYUMWERU

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10 KU WA MBERE

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11 KU WA KABIRI

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12 KU WA GATATU

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13 KU WA KANE

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14 KU WA GATANU

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15 KU WA GATANDATU

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16 KU CYUMWERU

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17 KU WA MBERE

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18 KU WA KABIRI

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19 KU WA GATATU

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20 KU WA KANE

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21 KU WA GATANU

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Series of horizontal dashed lines for writing.

5
2021

| Mon | Tue | Wed | Thu | Fri | Sat | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | | | | |

22 KU WA GATANDATU

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23 KU CYUMWERU

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24 KU WA MBERE

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25 KU WA KABIRI

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26 KU WA GATATU

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27 KU WA KANE

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28 KU WA GATANU

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KAMENA 2021

Muri uku kwezi, Imirimo y'ingenzi ikorwa ni iyi ikurikira:

- Gusarura Ibigori, ibishyimbo, Soya, Ingano, Umuceri n'ibirayi
- Gutunganya umusaruro w' Ibigori, ibishyimbo, Soya, Ingano, Umuceri n'ibirayi
- Guhunika umusaruro w' Ibigori, ibishyimbo, Soya, Ingano, Umuceri n'ibirayi

1 KU WA KABIRI

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2 KU WA GATATU

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3 KU WA KANE

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4 KU WA GATANU

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5 KU WA GATANDATU

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6 KU CYUMWERU

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7 KU WA MBERE

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8 KU WA KABIRI

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11 KU WA GATANU

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9 KU WA GATATU

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12 KU WA GATANDATU

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10 KU WA KANE

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13 KU CYUMWERU

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14 KU WA MBERE

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Lined writing area with horizontal dashed lines.

6
2021

| Mon | Tue | Wed | Thu | Fri | Sat | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | | | | | | | | | | | |

15 KU WA KABIRI

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16 KU WA GATATU

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17 KU WA KANE

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18 KU WA GATANU

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19 KU WA GATANDATU

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20 KU CYUMWERU

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21 KU WA MBERE

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22 KU WA KABIRI

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23 KU WA GATATU

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24 KU WA KANE

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25 KU WA GATANU

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26 KU WA GATANDATU

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27 KU CYUMWERU

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28 KU WA MBERE

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NYAKANGA 2021

Muri uku kwezi, Imirimo y'ingenzi ikorwa ni iyi ikurikira:

- Kurwanya indwara n'ibyonnyi mu mboga

1 KU WA KANE

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2 KU WA GATANU

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3 KU WA GATANDATU

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4 KU CYUMWERU

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5 KU WA MBERE

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6 KU WA KABIRI

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7 KU WA GATATU

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8 KU WA KANE

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11 KU CYUMWERU

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9 KU WA GATANU

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12 KU WA MBERE

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10 KU WA GATANDATU

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13 KU WA KABIRI

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14 KU WA GATATU

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Handwriting practice area with 20 sets of horizontal dotted lines.

7
2021

| Mon | Tue | Wed | Thu | Fri | Sat | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | | | | | | | | |

15 KU WA KANE

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16 KU WA GATANU

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17 KU WA GATANDATU

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18 KU CYUMWERU

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19 KU WA MBERE

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20 KU WA KABIRI

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21 KU WA GATATU

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Series of horizontal dotted lines for writing.

7
2021

| Mon | Tue | Wed | Thu | Fri | Sat | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | | | | | | | | |

22 KU WA KANE

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23 KU WA GATANU

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24 KU WA GATANDATU

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25 KU CYUMWERU

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26 KU WA MBERE

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27 KU WA KABIRI

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28 KU WA GATATU

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KANAMA 2021

Muri uku kwezi, imirimo y'ingenzi ikorwa ni iyi ikurikira:

- Gusarura imboga

1 KU CYUMWERU

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2 KU WA MBERE

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3 KU WA KABIRI

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4 KU WA GATATU

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5 KU WA KANE

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6 KU WA GATANU

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7 KU WA GATANDATU

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8 KU CYUMWERU

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11 KU WA GATATU

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9 KU WA MBERE

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12 KU WA KANE

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10 KU WA KABIRI

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13 KU WA GATANU

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14 KU WA GATANDATU

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15 KU CYUMWERU

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16 KU WA MBERE

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17 KU WA KABIRI

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18 KU WA GATATU

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19 KU WA KANE

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20 KU WA GATANU

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21 KU WA GATANDATU

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22 KU CYUMWERU

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23 KU WA MBERE

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24 KU WA KABIRI

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25 KU WA GATATU

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26 KU WA KANE

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27 KU WA GATANU

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28 KU WA GATANDATU

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NZERI 2021

Muri uku kwezi, Imirimo y'ingenzi ikorwa ni iyi ikurikira:

- Gutegura imirima (kurima) izahingwamo ibigori, ibishyimbo, soya, ingano, umuceri, ibirayi, imyumba n'urutoki
- Gutegura amafumbire azakoreshwa batera ibigori, ibishyimbo, soya, ingano, umuceri, ibirayi, imyumba n'urutoki
- Gutegura imbuto y' ibigori, ibishyimbo, soya, ingano, umuceri, ibirayi, imyumba n'urutoki

1 KU WA GATATU

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2 KU WA KANE

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3 KU WA GATANU

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4 KU WA GATANDATU

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5 KU CYUMWERU

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6 KU WA MBERE

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7 KU WA KABIRI

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8 KU WA GATATU

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11 KU WA GATANDATU

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9 KU WA KANE

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12 KU CYUMWERU

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10 KU WA GATANU

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13 KU WA MBERE

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14 KU WA KABIRI

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Multiple horizontal dashed lines for writing.

9
2021

| Mon | Tue | Wed | Thu | Fri | Sat | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | | | | | | | | | | |

15 KU WA GATATU

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16 KU WA KANE

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17 KU WA GATANU

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18 KU WA GATANDATU

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19 KU CYUMWERU

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20 KU WA MBERE

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21 KU WA KABIRI

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22 KU WA GATATU

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23 KU WA KANE

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24 KU WA GATANU

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25 KU WA GATANDATU

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26 KU CYUMWERU

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27 KU WA MBERE

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28 KU WA KABIRI

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UKWAKIRA 2021

Muri uku kwezi, Imirimo y'ingenzi ikorwa ni iyi ikurikira:

- Gutabira no gutera ibigori, ibishyimbo, soya, ingano, umuceri, ibirayi, imyumba n'urutoki
- Kubagara bwa mbere ibigori, ibishyimbo, soya, ingano, umuceri, ibirayi, imyumba n'urutoki

1 KU WA GATANU

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2 KU WA GATANDATU

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3 KU CYUMWERU

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4 KU WA MBERE

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5 KU WA KABIRI

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6 KU WA GATATU

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7 KU WA KANE

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8 KU WA GATANU

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11 KU WA MBERE

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9 KU WA GATANDATU

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12 KU WA KABIRI

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10 KU CYUMWERU

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13 KU WA GATATU

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14 KU WA KANE

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Series of horizontal dotted lines for writing.

10
2021

| Mon | Tue | Wed | Thu | Fri | Sat | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | | | | | |

15 KU WA GATANU

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16 KU WA GATANDATU

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17 KU CYUMWERU

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18 KU WA MBERE

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19 KU WA KABIRI

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20 KU WA GATATU

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21 KU WA KANE

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22 KU WA GATANU

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23 KU WA GATANDATU

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24 KU CYUMWERU

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25 KU WA MBERE

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26 KU WA KABIRI

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27 KU WA GATATU

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28 KU WA KANE

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UGUSHYINGO 2021

Muri uku kwezi, Imirimo y'ingenzi ikorwa ni iyi ikurikira:

- Kubagara bwa kabiri ibigori, ibishyimbo, soya, ingano, umuceri, ibirayi, imyumba n'urutoki
- Gusukira no gushyiraho ifumbire mvaruganda ku ibigori, ingano, umuceri, ibirayi, imyumba n'urutoki
- Kurwanya indwara n'ibyonnyi by' ibigori, ibishyimbo, soya, ingano, umuceri, ibirayi, imyumba n'urutoki

1 KU WA MBERE

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2 KU WA KABIRI

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3 KU WA GATATU

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4 KU WA KANE

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5 KU WA GATANU

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6 KU WA GATANDATU

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7 KU CYUMWERU

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8 KU WA MBERE

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11 KU WA KANE

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9 KU WA KABIRI

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12 KU WA GATANU

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10 KU WA GATATU

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13 KU WA GATANDATU

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14 KU CYUMWERU

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15 KU WA MBERE

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16 KU WA KABIRI

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17 KU WA GATATU

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18 KU WA KANE

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19 KU WA GATANU

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20 KU WA GATANDATU

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21 KU CYUMWERU

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22 KU WA MBERE

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23 KU WA KABIRI

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24 KU WA GATATU

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25 KU WA KANE

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26 KU WA GATANU

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27 KU WA GATANDATU

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28 KU CYUMWERU

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29 KU WA MBERE

Handwriting practice lines for the first column, corresponding to page 29.

Handwriting practice lines for the second column, corresponding to page 29.

30 KU WA KABIRI

Handwriting practice lines for the first column, corresponding to page 30.

Handwriting practice lines for the second column, corresponding to page 30.

UKUBOZA 2021

Muri uku kwezi, Imirimo y'ingenzi ikorwa ni iyi ikurikira:

- Gutegura imirima yo mu bishanga no gutera imboga
- Kufira imboga
- Kurwanya indwara n'ibyonnyi mu mboga
- Gutegura aho gusarurira no guhunika umusaruro

1 KU WA GATATU

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2 KU WA KANE

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3 KU WA GATANU

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4 KU WA GATANDATU

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5 KU CYUMWERU

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15 KU WA GATATU

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27 KU WA MBERE

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28 KU WA KABIRI

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IGICE CYA GATATU:

AMAFISHI Y'UBUHINZI N'UBWOROZI

1.

UBUHINZI KUBUNGABUNGA UBUTAKA

1. Kubungabunga ubutaka ni iki?

Ni ukurinda ubutaka gutwarwa n'isuri yaba ari iterwa n'imvura cyange n'umuyaga no kubuha ibikenewe bibufasha kugunduka no kugaburira igihingwa.

2. Kurinda ubutaka gutwarwa n'isuri

Isuri ni ugutwarwa kw'ubutaka n'imyunyungugu iburimo bitewe n'imvura cyange umuyaga. Isuri ikunda kugaragara cyane ku butaka buri ku misozi ihanamyeye, butariho ibikorwa byo kuyirwanya, budafite imborera ihagije, cyange se bwambaye ubusa. Bijyanye n'imiterere y'igihugu n'ikirere, isuri itewe n'imvura niyo ikunze kugaragara mu Rwanda.

2.1. Amoko y'isuri iterwa n'imvura

- *Isuri y'ibitonyanga by'imvura:* Iyungura ubutaka bugataruka bukava aho bwari buri bukimukira ahandi (photo).
- *Isuri kayunguruzo:* Iyungurura ubutaka bwo hejuru ikabutwara kurugerero rungana rw'aho yabereye (photo).
- *Isuri y'uturongo/utuyira:* Amazi atangira gutosa ubutaka agacamo utuyira duto duto, dushobora gusibwa barimo bahinga (photo).
- *Isuri y'imivu:* Ni isuri iterwa n'imvura nyinshi, igatangira kukukura imyobo miremire ku kigero cya santimetero 15 na 30 z'ubujyakuzimu (photo).
- *Isuri y'imikokwe:* Ni isuri iterwa n'imvura nyinshi, imivu ikagenda yaguka uganu mu mizi y'umusozi (photo).
- *Isuri y'Inkangu:* Ni mu gihe igice cy'umusozi cyagiye bitewe n'amazi aba yacengeye mu butaka akaba menshi umusozi ukariduka (photo).
- *Isuri y'imigezi:* Ni isuri iterwa n'imigezi yuzura, ikarengerwa, ingufu z'amazi zigacukura no gukukumba ubutaka bwo mu nzira isanzwe y'amazi y'imigezi.



2.2. Uburyo bwo kurwanya isuri iterwa n'imvura

Kurwanya isuri hakoreshwa uburyo butandukanye bukomatanijwe aribwo bw'ubu bukurikira:

- Gusasira ibihingwa nk'imbuto, ibigori, ikawa, ukoresheje ibisigazwa by'umugaru cyange kubitabika mu butaka urimo gutegura umurima (photo).
- Gucukura imiringoti haruguru y'umurima ifite uburere buri hagati ya metero 4 na 6, ubugari bufite sentimetero 40, n'ubujyakuzimu bufite sentimetero 50. Imiringoti igomba gutandukanywa n'agace gato kadacukuwe kazwi ku **n-tebe ya agaronome** gafite sentimetero 50 z'uburebure. Imiringoti icukurwa ku butaka bufite ubuhaname buri hagati ya 5-12%. Umwanya hagati y'umiringoti n'undi utandukana bitewe n'ubuhaname n'ubwoko bw'ubutaka nkuko bigaragazwa muri iyi mbonerhamwe.

| Ubuhaname | Umwanya hagati y'imiringoti (metero) |
|-----------|--------------------------------------|
| 2 | 20* – 40** |
| 5 | 15 – 22 |
| 10 | 10 – 16 |
| 15 | 9 – 14 |
| 20 | 8 – 13 |
| 25 | 6 – 10 |
| 30 | 5 – 9 |
| 35 | 4 – 8 |
| 40 - 100 | 3 – 7 |

(*) Umubare utegetswe mu butaka butwarwa cyane n'isuri

(**) Umubare utegetswe mu butaka budatwarwa cyane n'isuri

- Gutera ibiti bivangwa n'imyaka nka *kaliyandara* (*Calliandra C.*), *Lesena* (*Leuceana D.*), *Arimusi* (*Alnus A.*) *Gerevireya* (*Grevillea R.*), *Gilirisidiya* (*Gliciridia S.*), ku miringoti no kunkengeri z'umurima, ndetse n'ibyatsi nka *setaria*, *vetiveri*, *tiripusakumu n'urubingo*, bigakora uruzitiro (photo)
- Guca amaterasi y'indinganire ku butaka buhanamye no kuyateraho ibiti n'ibyatsi birumubura ubutaka mukingo wayo. Amaterasi acibwa ahari ubuhaname buri hagati ya 12 na 55%, ariko si ngombwa cyane hagati ya 12 na 30% mu gihe imiringoti, uduzi n'ibyatsi bifata ubutaka biyiteyeho bihagije (photo). Ubugari bw'iterasi bugenwa hakurikijwe ubuhaname bw'ubutaka nkuko bigaragazwa n'iyi mbonerhamwe (table slope categories):

Uko baca amaterasi:

- ✓ Ubanza gukuraho itaka ryo hejuru muri **sentimetero 10** ukarishyira kuruhande;
- ✓ Ukuraho na none iriri kuri sentimetero 10 kugera kuri 20 no kuri sentimetero 20 kugera kuri 30 naryo ukarirunda ukwaryo;
- ✓ Kakurikiraho gusiza uganisha guhinduriza ubuhaname bw'umusozi, umanura itaka ryo haruguru ukaritinda hepfo kuburyo rikora umukingo
- ✓ Urangije guca iterasi, usubisazaho rya taka washize kuruhande, uhereye kuryo muni, irukurikiraho, n'iryari hejuru.

Icyitonderwa:

- ❖ Mu guca amaterasi hagomba kurebwa ubuhaname bw'ubutaka, imiterere y'ubutaka, n'ibipimo by'imvura.
- ❖ Amaterasi y'indinganire ntacibwa ku butaka buseseka, bw'urusenyi cyane, bw'ibumba rimatira, bw'urubuye, butanywa amazi, bufite amaninda. Ntakorwa kandi mu itumba cyangwe mu gihe cy'impeshyi.

3. Kurumbura ubutaka

Kurumbura ubutaka bivuga kubuha ibyangombwa byose bituma igihingwa kibuhinzweho gikura neza kigatanga umusaruro uhagije. Ibyo byangombwa bizwe ahanini n'ishwagara ikoresha ku butaka busharira, ifumbire mborera, ibyatsi bifumbira, n'ifumbire mva ruganda.

3.1. Gukosora ubusharire bw'ubutaka

Ubutaka busharira bushyirwamo ishwagara iseye, iyunguruye ku kigero cya milimetero 5. Ubutaka bushyirwamo ishwagara bugomba kuba bufite ubusharire buri minsi ya 5.2. Ingano y'ishwagara ikoresha bikurikije urugero rw'ubusharire bw'ubutaka kuburyo bukurikira.

| Urugero rw'ubusharire | Ingano y'ishwagara (toni kuri hegitare) |
|-----------------------|---|
| 4.6-4.9 | 2.5 |
| 5.1-5.4 | 1.0 |
| 5.5-6.7 | 0.3 |

Icyitonderwa: Iyi ngano y'ishwagara ishyirwa mu murima bwa mbere ikongera gushyirwamo nyuma y'ibihemwe bitatu by'ihingwa, ariko buri gihembwe hagomba gushyirwamo imborera ihagije. Byaba byiza, mbere yo gushyiramo indi shwagara, kubanza gupima ubutaka kugira ngo umenye urugero rw'ubusharire. Ikarita ikurikira igaragaza imiterere y'ubutaka kubijyanye n'ubusharire (Ikarita y'ubusharire).

3.2. Gukoresha ifumbire y'imborera mu kurumbura ubutaka

Ifumbire y'imborera ni ifumbire ituruka ku binyabuzima byose biboze (ifumbire y'ibishanguka, y'amatungo, y'iminyorogoto, y'ibyatsi bitabikwa mu butaka cyange bivangwa n'imyaka bigakurura umunyu wa azote mu butaka uva mu kirere. Akamaro k'ifumbire y'imborera kagizwe n'ibi bikurikira:

- Yongera udukoko tw'ubunyabuzima mu butaka, bikongera ubuzima ku butaka
- Ituma ubutaka bworoha bityo ntibugore guhinga;
- Ifasha kubika amazi mu butaka, ikaburinda isuri kandi bugahora buhehereye,
- Ituma umwuka utembera neza mu butaka;
- Itanga imyunyungugu mu butaka ikenerwa n'igihingwa,
- Ivugurura imiterere y'ubutaka kuko ituma utunonkononko dukoze ubutaka twegerana;
- Ni intungamubiri z'udukoko tumwe na tumwe twangombwa mu kugaburira ubutaka n'ibihingwa;
- Igabanya ubusharire bw'ubutaka;

3.3. Amoko y'ifumbire y'imborera

Ifumbire y'imborera irimo amoko atandukanye, ayo ingenzi n'aya akurikira:

Ifumbire y'amatungo: Ni ifumbire iva ku matungo nk'inka, ihene, ingurube, inkwavu, inkoko.

Ifumbire y'ikimoteri/ingarane: Ni ifumbire iva kubisigazwa by'ibihingwa, byo murugo, n'ibindi byose bibora.

Ifumbire y'iminyorogoto: Ni ifumbire iva ku dukoko nyabuzima tw'iminyorogoto, turya ibibora tugashora ifumbire cyange twapfa tukabora tugakora ifumbire.

Ifumbire y'ibyatsi: Ni ifumbire y'ibyatsi bimera ku butaka ariko bifite ubushobozi bwo kubora mu gihe gito iyo babitabitse mu butaka.

Ifumbire y'uduti n'ibyatsi bivangwa n'imyaka: Ni ifumbire iva ku ku duti cyange ibyatsi bivangwa n'imyaka bifite ubushobozi bwo gukurura umwuka wa azote mu kirere bikawushyira mu butaka.

3.4. Ni gute wategura ifumbire y'imborera

Gukora ifumbire y'imborera ni ukurundira hamwe ibyatsi, ibibabi, uduti, ibisigazwa by'ibiribwa, iby'imbuto cyangwa se imboga kugirango bibora.

Hari uburyo bwinshi bwo gukora ifumbire. Twavuga nko gucukura ingarane n'ubwo gukora kirundo cy'ifumbire ku butaka.

Gukoresha ingarane

Ubu buryo bwa mbere bwo gukoresha ingarane ni bwiza ariko bufite ingaruka y'uko ifumbire itabora vuba, rimwe na rimwe imyunyu yo mu ifumbire ikaba yacengera mu ingarane bityo

iyu ukuyemo uguye kuyifumbiza ikaba ikennye.

Gukora ikirundo

Iyo ugiye gukora ifumbire y'ikirundo ugomba kuba ufite ibyatsi bibora, ibisigazwa by'imyaka n'ibishingwe bihagije. Ikirundo kiba gifite nibura metero 1 mu bugari na metero 1 na sentimetero 20 z'ubuhagarike kandi gifite ishusho y'umutemeri.

Ibizavamo ifumbire bigomba kubonerwa rimwe, bikarundwa ahantu hari igicucu mu nsi y'ibiti cg mu rutoke.

Nyuma yo gusiza ahazakorerwa ifumbire, hakurikiraho gusasa ibisigazwa by'umusaruro, ibyatsi bibi, utwatsi, amababi y'ibiti n'ibihuru kugeza kuri sentimetero 15-20 z'ubuhagarike. Ibyo byose bibanza gucagagurwamo uduce duto duto kugirango bizabore vuba, kandi si byiza kubanza kubyanika. Hejuru hagerekwaho nibura sentimetero 5 z'ibibora neza nk'ifumbire y'amatungo, ibishishwa bya kawa cyangwa agataka karimo ifumire keza gatose. Bituma n'ibindi byose bibora. Hejuru hongerwaho sentimetero 20 z'ibindi byatsi, amababi y'ibiti... bicagaguye. Harenzwaho na none ibibora sentimetero 5. Bigenda bigerekeranywa gutyo gutyo kugeza kirundo cyuzuye. Nyuma ikirundo kiratwikirwa kugirango kitumagara, bityo mikorobe ziboza ntizibone amazi yo kuzitunga ngo zikore akazi kazo. Si byiza kandi kurenzaho igitaka cyinshi cyangwa gutsindagira cyane kugirango izo mikorobe zitabura umwuka zihumeka.

Ni ngombwa kugenzura ubushyuye kuko ari bwo bwerekana ko mikorobe ziri gukora akazi kazo ko guhinduramo ibyatsi ifumbire. Ni ngombwa na none guhindura no kuvomera ikirundo ku rugero rukwiye kugirango kibone umwuka n'amazi udukoko dukeneye mu gucagagura ibyatsi o kuba cyaborera rimwe.

Ifumbire y'imborera ikorwa neza ku buryo bworoshye mu gihe cy'imvura, kurushaho mu gihe cy'umuhindo. Ifumbire irushaho kuba nziza iyo yongewemo ivu ryo mu gikoni cyangwa ishwaraga cg agafumbire mvaruganda gake. Gusa ibi si ngombwa cyane. Ifumbire nziza y'imbonerara iba yumutse, iseseka, kandi yirabura iri ku gipimo cya 1/5 cy'uburemere bw'ibyahereweho kuyikora (photo).

Gukoresha neza ifumbire y'imborera

Ifumbire y'imborera ishyingira mu murima igihe cy'ihinga. Ntigomba kwanikwa kugirango idatakaza imyunyu imwe n'imwe nka azote. Nyuma yo gutabira inyanyagizwa mu murima igaherako itabwa ikavangwa n'igitaka igihe cy'isanza. Hakenerwa toni kuva kuri 10 kugera kuri 20 kuri hegitari.

Kuraza umurima

Kuraza umurima bituma ubutaka buruhuka. Ibyatsi birimeza, ibiti n'amababi yabyo byumye bigwa ku butaka bikabora. Mu gihe cyo guhinga byose biratabwa, ubutaka bukahabonera ifumbire y'imborera ihagije n'imyunyu myinshi bityo bukiyubiza.

Gusasira umurima

Uretse kurwanya isuri no kubika amazi mu butaka, gusasira ubutaka ni kimwe mu biburumbura. Iyo iboze ibyara ifumbire ituma ubutaka bubasha kwiyubaka. Mu gusasira, hagati y'ibihingwa batwikiriza ubutaka ibigorigori, ibikenyeri, ibishwangara, ishinge cyangwa ibindi byatsi byumye bidashibuka. Bigera kuri cm 10 kugera kuri 20 mu buhagarike. Isaso ntigomba gukora ku gihingwa gisasirwa kugirango kirindwe umuswa, mikorobi cyangwa uduhumyo twacyangiza.

Gutaba ibyatsi cyangwa ibisigazwa by'imyaka

Gutaba ibyatsi cyangwa ibisigazwa by'imyaka bitarwaye na byo birumbura ubutaka kuko iyo biboze bisubizamo igice kinini cy'imyunyu yari ibirimo. Ibyatsi bitabwa ni ibiba byatewe ku materasi, ku miringoti, ibiba byarajwe mu murima cyangwa se ibisigazwa by'imyaka bimaze gutemagurwamo uduce duto duto.

Guhinga ibihingwa-fumbire

Ibihingwa-fumbire ni ibihingwa bihingirwa kuzatabwa. Ibyo ni ibihingwa biri mu muryango w'ibinyamisogwe nka *Mucuna(Mukuna)*, *desmodium*, *luzerne* n'ibindi. Bifata azote iri mu mwuka ari na yo ituma ibihingwa bikura, bikayishyira mu butaka bikoreshaje uduheri two ku mizi yabyo. Iyo batabye igihingwa-fumbire bari barateye kirabora kigatanga imborera.

Uburyo bwo gukoresha iminyorogoto (Vermicomposting)(photo)

Ubu ni ubundi buryo bukoreshwa mu kubona ifumbire y'imborera. Iyi fumbire ikorwa n'iminyorogoto ishangura imyanda yaba iyo mu gikoni mu mirima mu bimpoteri mu nganda n'ahandi mu buryo bwihuse. Iyi minyorogoto ikurira neza ahantu hatumagaye /hadakakaye ariko nanone hatajandamye, hatari ibiryo bihiye n'inyama, hatari n'urumuri rwinsi. Iminyorogoto yororerwa mu gisanduku ushyiramo imborera iboze iyifasha kororoka mbere yo kuyikoresha.

3.5. Ifumbire mvaruganda

Ifumbire mvaruganda n'ifumbire igizwe n'imyunyu itandukanye igihingwa gikenera kugira ngo gishobore gukura neza kandi gitange umusaruro uhagije. Amoko y'ifumbire mvaruganda aratandukanye bitewe n'igihingwa ndetse n'imiterere y'ubutaka. Bitewe n'ubwoko bw'ayo, hari igenewe guterana n'igihingwa, hari n'iyongerwamo nyuma cyange se ibagazwa. Iyi mbonerahamwe igaragaza uburyo bwo gukoresha ifumbire mvaruganda ku bihingwa bitandukanye.

| | | Ingano (Ibiro kuri are) | |
|------------|----------------------------|-------------------------|---|
| Igihingwa | Ubwoko bw'ifumbire | Iteranwa | Ibagazwa |
| Ibigori | DAP/CEREAL | 1/1.25 | |
| | Urea/Amidas | 0.5 | 0.5 |
| Umuceri | NPK17-17-17/CEREAL/DAP/KCL | 2/2/0.8/0.6 | |
| | AMIDAS/UREA | | 1/1 |
| Ingano | DAP/CEREAL | 1 | |
| | UREA/AMIDAS | | 0.5/1 |
| Ibirayi | NPK 17-17-17/WINNER | 3/3 | |
| | NITRABOR/TRACER BZ | | 1.25/0.02 |
| Ibishyimbo | DAP/WINNER | 1/1.25 | |
| Soya | DAP/WINNER | 1/1.25 | |
| Imyumbati | NPK 17-17-17/WINNER | 3/3 | |
| | UREA | | 1 |
| Urutoki | NPK17-17-17/WINNER | | 100g ku nsina ku muhindo, n'100kg ku itumba. |
| | UREA/AMIDAS/NITRABOR | | 3/1.5/1.5 |

2.

KURUMBURA UBUTAKA

Kurumbura ubutaka bivuga kubuha ibyangombwa byose bituma bushobora gutunga igihingwa, hari ibikorwa by'ingenzi bikorwa mu kurumbura ubutaka aribyo:

- Kurwanya isuri,
- Kuvugurura ubutaka, ugabanya ubusharire utera ishwagara n'ifumbire y'imborera
- Kongeraho kubuha myunyu ari byo bita gufumbira.

1. Kurumbura ubutaka n' ifumbire y' imborera

Ifumbire y'imborera ni ifumbire ituruka ku binyabuzima byose biboze (ifumbire y'ibishanguka n'ifumbire y'amatungo)

- Ituma ubutaka bworoha bityo ntibugore guhinga;
- Irinda isuri ubutaka kuko ituma bubika amazi aho gutwarwa nayo kandi bugahora buhehereye;
- Ituma umwuka utembera neza mu butaka;
- Igaburira ubutaka itanga imyunyu igihingwa kiba gikeneye
- Ivugurura imiterere y'ubutaka kuko ituma utunonkononko dukoze ubutaka twegerana;
- Ni intungamubiri z'udukoko tumwe na tumwe twangombwa mu kugaburira ubutaka n'ibihingwa;
- Igabanya ubusharire bw'ubutaka;
- Igabanya uburozi bumwe na bumwe mu butaka kandi ikaba yifitemo ubushobozi bwo gufasha igihingwa guhangana n'indwara.

1.1. Ni gute wategura ifumbire y'imborera

Gukora ifumbire y'imborera ni ukurundira hamwe ibyatsi, ibibabi, uduzi, ibisigazwa by'ibiribwa, iby'imbuta cyangwa se imboga kugirango bibore. Hari uburyo bwinshi bwo gukora ifumbire harimo gucukura ingarane cyangwa gukora kirundo cy'ifumbire ku butaka.

Gukoresha ingarane:

Ubu buryo bwa mbere bwo gukoresha ingarane ni bwiza ariko bufite ingaruka y'uko ifumbire itabora vuba, rimwe na rimwe imyunyu yo mu ifumbire ikaba yacengera mu ngarane bityo iyo ukuyemo ugiye kuyifumbiza ikaba ikennye.

Gukora ikirundo

Iyo ugiye gukora ifumbire y'ikirundo ugomba kuba ufite ibyatsi bibora, ibisigazwa by'imyaka n'ibishingwe bihagije.

Ikirundo kiba gifite nibura metero 1(m1) mu bugari na metero 1 na sentimetero 20 z'ubuhagarike. Ibyatsi bizavamo ifumbire bigomba kubonera rimwe, bikarundwa ahantu hari igicucu.

- Nyuma yo gusiza ahazakorerwa ifumbire, hakurikiraho gusasa ibisigazwa by'umusaruro, ibyatsi bibi, utwatsi, amababi y'ibiti n'ibihuru kugeza kuri sentimetero 15-20 z'ubuhagarike. Ibyo byose bibanza gucagagurwamo uduce duto duto kugirango bizabore vuba, kandi si byiza kubanza kubyanika.
- Hejuru hagerekwaho nibura sentimetero 5 z'ibibora neza nk'ifumbire y'amatungo, ibishishwa bya kawa cyangwa agataka karimo ifumbire keza gatose. Bituma n'ibindi byose bibora.
- Hejuru hongerekwaho sentimetero 20 z'ibindi byatsi, amababi y'ibiti... bicagaguye. Harenzwaho na none ibibora bikagenda bigerekeranywa gutyo gutyo kugeza ikirundo cyuzuye.
- Nyuma ikirundo kiratwikirwa kugirango kitumagara, bityo mikorobe zibaza zikabona amazi yo kuzitunga ngo zikore akazi kazo.
- Si byiza kandi kurenzaho igitaka cyinshi cyangwa gutsindagira cyane kugirango izo mikorobe zitabura umwuka zihumeka.

Ni ngombwa kugenzura ubushyuhe kuko ari bwo bwerekana ko mikorobe ziri gukora akazi kazo ko guhinduramo ibyatsi ifumbire.

- *Iyo ubushyuhe bugabanutse haba hari ikibazo cy'amazi make cyangwa menshi cyangwa umwuka. Ni cyo gituma ari ngombwa guhindura ikirundo ibyari hasi bikajya hejuru kugirango bibore rimwe.*
- Guhindura ikirundo ni igikorwa cyo gukwirakwiza umwuka kikagendana no kuvomerera kugirango mikorobe zitabura amazi. Kuvomerera kandi ningombwa iyo hakoreshejwe ibyatsi byumye. *Twibutse ko amazi atagomba kuba menshi nayo ni ukuyagenzura.*
- Ifumbire y'imborera ikorwa neza ku buryo bworoshye mu gihe cy'imvura, kurushaho mu gihe cy'umuhindo. Ifumbire irushaho kuba nziza iyo yongewemo ivu ryo mu gikoni cyangwa ishwagara. Gusa ibi si ngombwa cyane. Ifumbire nziza yumutse ivamo iba ipima hafi 1/5 cy'uburemere bw'ibyahereweho kugirango iboneke.

2. Kuraza umurima

Kuraza umurima bituma ubutaka buruhuka. Ibyatsi birimeza. Ibiti n'amababi yabyo byumye bigwa ku butaka bikabora. Mu gihe cyo guhinga byose biratabwa, ubutaka bukahabonera ifumbire y'imborera ihagije n'imyunyu myinshi bityo bukisubiza.

3. Gusasira umurima

Uretse kurwanya isuri, gusasira ubutaka ni kimwe mu biburumbura Isaso ituma ubutaka buhora buhehereye bityo nko mu gihe cy'impeshyi ibihingwa bimwe na bimwe bikabasha kwihanganira izuba.

Iyo iboze ibyara ifumbire ituma ubutaka bubasha kwiyubaka. Ibuza kandi ibyatsi bibi kwiyongera. Mu gusasira, hagati y'ibihingwa batwikiriza ubutaka ibigorigori, ibikenyeri, ibishangara, ishingwe cyangwa ibindi byatsi byumye bidashibuka. Bigera kuri cm 10 kugera kuri 20 mu buhagarike. Isaso ntigomba gukora ku gihingwa gisasirwa kugirango kirindwe umuswa, mikorobi cyangwa uduhumyo twacyangiza.

4. Gutaba ibyatsi cyangwa ibisigazwa by'imyaka

Gutaba ibyatsi cyangwa ibisigazwa by'imyaka na byo birumbura ubutaka kuko iyo biboze bisubizamo igice kinini cy'imyunyu yari ibirimo. Ibyatsi bitabwa ni ibiba byatewe ku materasi, ku miringoti, ibiba byarajwe mu murima cyangwa se ibisigazwa by'imyaka. Aho byaturuka hose bibanza gutemwa hanyuma bigahingirwaho. Ni ngombwa kwitondera gutaba ibigorigori n'ibikenyeri byinshi kuko mu gihe cyabyo cyo kubora bitwara azote nyinshi y'ubutaka. Ibyiza ni ugutaba bikebishoboka, ibindi bigakorwamo ifumbire y'imborera hejuru y'ubutaka.

5. Guhinga ibihingwa-fumbire

Ibihingwa-fumbire ni ibihingwa bihingirwa kuzatabwa. Ibyo ni ibihingwa biri mu muryango w'ibinyamisogwe nka Mucuna, desmodium, luzerne n'ibindi. Bifata azote iri mu mwuka ari na yo ituma ibihingwa bikura, bikayishyira mu butaka bikoresheje uduheri two ku mizi yabyo. Iyo batabye igihingwa-fumbire bari barateye kirabora kigatanga imborera.

6. Uburyo bwo gukoresha iminyorogoto (Vermicomposting)



Ubu ni ubundi buryo bukoreshwa mu kubona ifumbire y'imborera. Iyi fumbire ikorwa n'iminyorogoto ishangura imyanda yaba iyo mu gikoni mu mirima mu bimpoteri mu nganda n'ahandi mu buryo bwihuse. Iyi minyorogoto ikurira neza ahantu hatumagaye / hadakakaye ariko nanone hatajandamye, hatari ibiryo bihiye n'inyama, hatari n'urumuri rwinshi. Ubu buryo bwo gulora ifumbire nibwiza cyane kuko usanga aho ikorerwa nta munuko changwa amasazi ahari. Ikindi ni uko iyo minyorogoto idashobora kugira ahandi ijya uretse muri icyo gisanduku. Iyi fumbire usanga imeze nk'itaka yarashangutse neza.

Amoko y'ifumbire ikomoka k'uminyorogoto

- Ifumbire ikomeye (worm casting)
- Ifumbire y'amazi worm tea
- Ibikenewe
- Igisanduku gihitisha umwuka
- Ibisasirwa bibika ubuhehere
- Iminyorogoto
- Imyanda ibora uretse ibiryo bitetse
- Ishashi y'mukara yo gutwikira
- Ijerikani yo kureza amazi avamo

Uko bikorwa

- Hakoreshwa igisanduku gihagaze ku maguru ane.
- Indiba yacyo ni ibati (kureza amazi ava mw'ifumbire nayo
- agakoreshwa nk 'ifumbire y'amazi).
- Gushyiraho umureko wo kuyobora umushongi mw'ijerikani.
- Gushyiramo isaso (ibikarito,impapuro,...)
- Kuzana iminyorogoto ikiri mw'ifumbire yayo ukayinyanyagiza kuri ya saso.
- Kongeraho ibigaburirwa (ibikonko,ibishishwa byo mu gikoni,...)
- Bigomba kuba bihehereye.
- Gutwikira na shitingi y'umukara.



Igihe isarurirwa/ikoresherezwa

- Nyuma y'ukwezi umaze gushyira ibikenewe byose mu gisanduku cyabugenewe, ifumbire iba imaze kuboneka ukajya usarura rimwe mu kwezi.
- Ifumbire isarurwa hifashishijwe urumuri kuko rwirukana iminyorogoto. Iyo upfunduye/ukuyeho ishashi iminyorogoto yose yibira mw'ifumbire ukayora ifumbire yo hejuru. Ugenda uyigaburirira iruhande rumwe iminyorogoto ikajya yimukira ahari ibiryo ugakura ifumbire aho yavuye.

7. Gukoresha ifumbire y'imborera:

Ifumbire yo mu ngarani cyangwa y'ikirundo ikoreshwa iyo yahoze bivuga igihe udashobora kumenya ishusho y'ibyo uba wayikozemo;

Mu kuyikoresha dore ibipimo mbonera:

- Ku bihingwa **ngandura-rugo (ibishyimbo, soya...)**: nibura **kg 100 kuri ari 1**
- **Ku mboga** ni hagati ya kg 300 na kg 400 kuri ari 1
- **Ku bihingwa biterwa mu myobo** (ibiti byera imbuto ziribwa, insina, ...) hakoreshwa kg 50 buri mwobo.

Icyitonderwa: ifumbire iyo igeze mu mirima iranyanyagizwa kandi igahita itabwa ikavangwa n'ubutaka.

8. Ifumbire mvaruganda

Ifumbire mvaruganda ni ifumbire ikorerwa mu ruganda iba irimo imyunyu y'ubutaka. Iyo myunyu iba mu mafumbire ishongeshwa vuba n'amazi bikivanga. Bityo uko igihingwa kivoma amazi kikayivomamo. Iyo amazi acengera kure mu butaka ajyana n'iyi myunyu. Ibihingwa ntibishobore kuyikoresha. Ni cyo bita "kurigita kw'imyunyu y'ubutaka". Iyo ibumba n'imborera bihagije mu butaka bifata amazi avanze n'iyi myunyu. Bityo iyo myunyu ikaguma hafi y'ubutaka.

- Rero ifumbire mvaruganda igira akamaro iyo ikoreshejwe ku butaka bufite imiterere myiza, bukize ku mborera. Iyo ikoreshejwe yonyine ari nyinshi, cyane cyane ikize mu myunyu nka azote, ituma mikorobi z'ubutaka ziyongera vuba vuba. Bityo zikanyunyuzwa imborera yose kandi ari yo ituma ubutaka bwegerana. Iyo irangiye, za mikorobi zirapfa n'ubutaka bugasigara bumeze nk'ivumbi ku buryo n'imizi ishobora kubura aho ifata. Icyo gihe ubutaka bubura ubuzima bukagunduka. Isuri na yo ishobora kuririraho kuko ubutaka buba butagifatanye. Ni ngombwa rero kwirinda kurenza urugero rw'ifumbire mvaruganda yo gukoresha no kwirinda kuyikoresha yonyine.

- Amafumbire mvaruganda abamo amoko atandukanye hari arimo umunyu 1 w'ubutaka, andi avanze mo imyunyu 2 andi 3. Imenyerewe cyane ni NPK irimo imyunyu itatu: azote, fosifore na potasiyumu.

Ishobora gushongeshwa mu mazi nyuma agasukwa mu ifumbire y'imborera igiye guterwa mu murima. Gusa kubera ko ihenda, ibyiza ni ukuyishyira hafi y'imizi y'igihingwa mu murongo hanyuma hakarenzwaho agataka.

- Ku butaka buhanamye ifumbire ishyirwa haruguru gato y'umwobo ujyamo igihingwa.
- Ku bihingwa bimwe na bimwe nk'imbuto y'ibirayi, ifumbire ishyirirwa rimwe mu mwobo n'imbuto. Ku biti by'imbuto, ikawa, insina ifumbire bayizengurutsaho.

9. Inkosorabutaka

Ni inyongeramusaruro, zikoreshwa mu gukosora imiterere y'ubutaka nk'ubusharire n'imyunyu nka **aluminiumu**. Urugero ni nk'ishwagara y'ubuhinzi ikoreshwa mu kugabanya ubusharire bw'ubutaka.

- Urugero **rw'ishwagara** yo gushyira mu butaka ruterwa n'urugero rw'ubusharire bwabwo ndetse n'igihingwa. Ubutaka burimo ifumbire y'imborera ihagije busaba ishwagara nkeya. Ibiro hagati ya 20 na 30 by'ishwagara kuri ari 1 biba bihagije. Ishwagara ivangwa neza n'ubutaka iterwa ibyumweru 2 mbere yo gutera imyaka. Guterana n'imyaka bishobora gutuma ibabuka.

10. Kuvomerera ubutaka

Amazi ni ingenzi ku butaka no ku bihingwa byose iyo biva bikagera. Ubutaka budafite amazi ntibwabaho. Imyunyu yose ibihingwa bikenera itembera mu mazi y'ubutaka. icyo wakorera cyose ibihingwa bidafite amazi nta cyo byabimarira. Ni ngombwa rero gushakira ubutaka n'ibihingwa amazi akenewe ku rugero, ni ukuvuga kugabanywa mu gihe abaye menshi no kuvomerera mu gihe abaye make.

Mu Rwanda hari uburyo bwo kuhira butatu, ari bwo:

- **Kuhira ku buso bunini mu mabanga y'imisozi,**
- **Gutunganya ibishanga hubakwa ama damu (Ibidendezi by'amazi) no**
- **Kuhira ku buso buto.**

3.

KUHIRA IMYAKA

1. Gutunganya igishanga:

Amazi akurwa mu migezi, ibiyaga cyangwa ibidendezi by'amzi agashyirwa mu miyoboro iyegereza imirima aho umuhinzi abasha kuyafatira ayerekeza mu murima we. Inyubako dusanga mu gishanga harimo izigabanya umuvuduko w'amazi, ibiraro, inyubako zifata amazi ku muyoboro munini ziyashyira mu muyoboro muto, iziyafata ziyashyira mu murima n'imihanda.



Umuhinzi arasabwa iki mu gukomeza gusigasira ibishanga byatunganijwe?

- Umuhinzi asabwa gusibura umiyoboro itwara amazi byibuze kabiri mu gihembwe cy'ihinga
- Ibyondo bivanwa mu nyubako zibika amazi byibuze rimwe mu gihembwe cy'ihinga
- Gusana ibikorwa byandingiritse bikoreshwa mu kuhira no gutwara amazi igihe cyose bibaye ngombwa;
- Gusibura umugende munini uvana amazi mu gishanga;
- Gukurikiza ingengabihe yo kuhira hagendewe ku mazi akenewe kuri buri gihingwa mu cyanya cyuhirwa;
- Gusaranganya amazi ku buryo bunoze mu bahinzi
- Gusana imiyoboro yangiritse kugira ngo amazi akomeze agere aho yajyaga.

2. Kuhira ku mabanga y'imusozi

Kuhira mu mabanga y'imusozi bisaba ingufu zitangwa n'imashini izamura amazi mu matiyo agenda akagera mu mirima iri i musozi, izo mashini zizamura amazi zikoresha umuriro w'amashanyarazi, risansi cyangwa mazutu ari byo bitanga imbaraga ziba zikenewe mu kuzamura amazi imusozi.



Kuhira imusozo tubisangamo uburyo butatu bukoreshwa mu Rwanda ari bwo:

- Kuhira amazi agwa nk'imvura hifashishijwe utumashini tumisha amazi (**sprinkler**),
- kuhira hakoreshejwe imashini zizenguruka nazo zimisha amazi nk'imvura (**center pivot**) no
- Kuhira amazi atonyanga ku muzi w'igihingwa aturuka mu dutiyo duto tuba turambitse mu mirima (**Drip irrigation**).

Hagendewe ku buryo bwo kuhira bukoreshwa mu murima, umuhinzi aba asabwa kumenya imikorere n'imikoreshereze y'ibikoresho bijyana na bwo:

Ku mashini yuhira yizengurukaho (**Center pivot**), umuhinzi asabwa kureba ibi bikurikira:

- ✓ Kugenzura niba aho imashini inyura hameze neza (atari mu isayo).
- ✓ Kugenzura ko amapine arimo umwuka, aringaniye kandi ari ku murongo umwe akumenya kuyagorora;
- ✓ Kugenzura niba iminwa y'amatiyo ikora neza (itazibye)kandi nta yibuzemo;
- ✓ Kureba niba insinga zose z'amashanyarazi n'udutiyo tw'amazi bitarangiritse
- ✓ Kugenzura ko akayunguruzo k'amazi gasukuye
- ✓ Kureba ko akuma gafungura amazi kerekeye mu cyerekezo ushaka ko ukoreramo
- ✓ Kureba niba amashanyarazi ari mu mashini yuhira urebeye ku kuma k'umukara kari munsu gacana itara ry'icyatsi kibisi
- ✓ Kureba uko amashanyarazi ari mu mashini angana
- ✓ Gushyira amashanyarazi mu kigereranyo kiberanye n'imikoreshereze y'imashini yuhira
- ✓ Gushyira ingano y'amazi mu kigereranyo ukurikije ingengabihe yo kuhira;
- ✓ Gucana imashini yuhira ukurikije icyerekezo yari irimo cyangwa kugihindura bitewe n'aho ushaka kuhira
- ✓ Kumenya no gusobanukirwa ikintu cyose gishobora gutuma imashini yuhira idakora
- ✓ Kuzimya imashini yuhira igihe kuhira atari ngombwa.

Utwuma twuhira tumisha amazi nk'imvura

- Kureba ibikoresho byuhira byose niba biri mumwanya wabyo
- Kureba ko ntaho inzira z'amazi ziva bityo bigasaba gusana aho amatiyo yapfumutse
- Kureba ko ingufu zikenewe zihari kugira ngo zibashe kuvomerera neza
- Kubahiriza ingengabihe yo kuhira mbere yo kwimura amatiyo
- Kureba ko ingano y'amazi akenewe abasha kugera mu murima
- Kuzibura iminwa y'utwuma twuhira tumisha amazi mu gihe yazibye
- Kugenzura ko akayunguruzo k'amazi gasukuye.

Uburyo bwo kuhira amazi atonyanga ku mizi y'igihingwa

- ✓ Kugenzura ko inzira z'amazi zimeze neza
- ✓ Kureba ko ntaho amazi ava bityo bigasaba gusana aho amatiyo yapfumutse
- ✓ Kureba ko ingufu zikenewe zihari kugira ngo zibashe kuvomerera neza
- ✓ Kubahiriza ingengabihe yo kuhira mbere mbere yo gufunga no gufungura ahandi
- ✓ Kureba ko ingano y'amazi asabwa abasha kugera mu murima
- ✓ Kuzibura udukoresho dusohora amazi (emitters) mu gihe twazibye
- ✓ Kugenzura ko akayunguruzo k'amazi gasukuye.

3. Kuhira kubuso buto



Leta y'u Rwanda yashyizeho gahunda yo kunganira abahinzi ku bikoresho byo kuhira ku buso buto inyuze mu kigo cy' Igihugu gishinzwe guteza imbere ubuhinzi n'ubworozi (RAB). Iyo nkunganire igizwe no kwishyurira umuhinzi 50% y'ikiguzi cyose gisabwa umuhinzi mu kubona ibikoresho byo kuhira n'ibikoresho byo gufata amazi ku buso butarenze hegitari 10. Iyi porogaramu ishyirwa mu bikorwa n'umuhinzi usaba ibyo bikoresho, abatanga serivisi zo gutanga ibikoresho ku muhinzi ndetse na RAB yishyura 50 %.

- Umuhinzi ubishaka abisaba ku karere cyangwa kuri RAB yuzura ifishi isaba kubona ibyo bikoresho kuri nkunganire
- Abatekinisiye bagenzura umurima niba wujije ibya ngombwa bisabwa bakanemeza niba umuhinzi yabona ibyo bikoresho;
- Umuhinzi agura ibikoresho byemejwe n'umutekenisiye ku muntu utanga serivisi zo gutanga ibyo bikoresho byo kuhira akishyura 50 % y'ikiguzi cyose
- Ibyo bikoresho bisanwa n'umuntu utanga serivisi zo kugeza ibikoresho byo kuhira ku bahinzi mu gihe cyingana n'umwaka atishyurwa.

Abahinzi bashobora gukoresha neza ibyo bikoresho byo kuhira byatanze kuri nkunganire bakora ibi bikurikira

- Kugenzura neza ahantu washyira icyobo cyakwifashishwa hakururwa amazi hakoreshajwe pompe
- Kureba ko amatiyo atwara amazi afatanye neza ntaho ava
- Kureba neza niba ingufu zifashishwa zihari kandi zihagije (mazutu n'amashanyarazi)
- Kureba ko amatiyo arambuye neza, atizinze cyangwa yikubye byose bica intege za moteri
- Gushyira mu mirima neza ibyuma byuhira birimo imashini zuhira ukagenzura amaguru zihagararaho ko ahagaze neza kandi akomeye.
- Kurambura umupira wuhira ukawugeza ku murima mugihe ariwo wifashishwa umisha amazi kubihingwa
- Kubahiriza gahunda yo kuhira himurirwa kugihe ibikoresho bishyirwa mu wundi murima ukurikiraho mu gihe hakoreshwa uburyo bwo kwimura uva hamwe ujya ahandi.

4.

GAHUNDA YO GUKORESHA IMASHINI MU MIRIMO ITANDUKANYE Y'UBUHINZI N'UBWOROZI

(AGRICULTURE MECHANIZATION)

Ni iyihe imirimo y'ubuhinzi n'ubworozi ikorwa n'imashini?

A. MU BUHINZI

- Kurima
- Gusanza
- Gutera imbuto,
- Gutera imiti,
- Kubagara,
- Gusarura,
- Guhungura
- Kumisha,
- Gutoranya,
- Gukonjesha ibyangirika n'izindi.

Hari izindi mashini nyinshi zitandukanye zikoreshwa mu buhinzi kuva mu gutegura umurima kugeza umusaruro ugeze ku isoko.

Mu murimo yo gutegura ubutaka, hari mashini irima ishobora guhinga hagati ya hegitari 2-3 k'umunsi, ahantu hasaba abantu barenga 200 kuharima ku munsu hakoreshejwe imashini z'ubwoko abahinzi bamwe bamaze kumenyera.

Izo mashini ziraboneka haba ari ukuzigura cyangwa kuzikodesha n'abikorera batanga iyo service ku giciro cyiza. Uburyo bwo kuzibona umuhinzi yanyura ku kigo cy'igihugu gishinzwe iterabweme ry'ubuhinzi cyangwa agronome ku karere no mu mirengye bakamuha icyerekezo cyangwa akanyura kuri ba rwiyemezamirimo bamwegereye batanga izo service

Ku muhinzi ufite ubutaka buto ashobora no gukoresha imashini ntoya (powertillers) mu guhinga, kuhira no gutwara umusaruro.

Imashini zikoreshwa mu buhinzi zigiyeye zitandukanye, bitewe n'ingufu za moteri n'amasuka yakoreshejwe, hari n'izishobora guhinga zikanasanza hejuru ya 10ha ku munsu ku muhinzi ufite ubutaka bunini.

Aho imashini nini ihinga neza ni ahantu hadafite ubuhaname bukabije kuburyo imashini yatembagara bikaba byateza impanuka, ahantu hateguwe neza hatarimo indi myaka, ibishyitsi n'amabuye bishobora kwagira imashini.



Imashini iri kurima amasinde

- **Gusanza**



Imashini irimo isanza

- **Gutera imbuto n'ifumbire**



Imashini nini yambaye isuka itera imbuto

- **Gutera imiti yica udukoko**



Imashini yambaye ipompo itera imiti yica udukoko

- **Gutwara umusaruro n'inyongera musaruro**



Imashini yambaye rumoroki itwara umusaruro n'inyongera musaruro

- **Gusarura**



Imashini isarura

- **Gutunganya umusaruro**



Imashini itunganya umusaruro

- **Kuzinga ubwatsi**



Imashini izinga ubwatsi

5. UBUHINZI BWA KIYAMBERE KU BIHINGWA NGANDURARUGO.

A. IBIGORI



1. Aho bihingwa mu Rwanda

Ibigori bihingwa hose mu gihugu kuva ku butumburuka bwa metero 900 (Bugarama) kugeza ku butumburuke bwa metero 3000 (ku nkengeri z'ibirunga)

2. Ubutaka:

Ibigori byera neza iyo bihinze mu murima ufumbiye, utaragundutse, mu butaka bw'isi ndende, bworoshye kandi bubika amazi. Umurima ugomba kuba utasaruwe mo ibigori cyangwe se ibindi binyampeke nk'amaska ni ingano mu gihembwe cy'ihinga gishize.

3. Amoko yamamazwa:

| No | Izina ry'ubwoko | Aho yera | Ubutumburuke (m) | Nyiriimbuta |
|----|-----------------|---------------------------------------|------------------|-------------|
| 1 | RHM104 | Mu misozi migufi n'imisozi iciriritse | 900-1800 | RAB |
| 2 | RHM1402 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | RAB |
| 3 | RHM1407 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | RAB |
| 4 | RHM1409 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | RAB |

| | | | | |
|----|----------|---------------------------------------|-----------|---------|
| 5 | RHHH1520 | Mu misozi miremire | 1700-2600 | RAB |
| 6 | RHHH1601 | Mu misozi miremire | 1700-2700 | RAB |
| 7 | PAN-4m21 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | PANNAR |
| 8 | PAN 53 | Mu misozi migufi n'imisozi iciriritse | 900-1800 | PANNAR |
| 9 | PAN 67 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | PANNAR |
| 10 | SC 403 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | Seed Co |
| 11 | SC 513 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | Seed Co |
| 12 | SC 529 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | Seed Co |
| 13 | WH 505 | Mu misozi migufi n'imisozi iciriritse | 900-1800 | WSC |
| 14 | WH 507 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | WSC |
| 15 | WH 403 | Mu misozi migufi n'imisozi iciriritse | 900-1700 | WSC |
| 16 | H628 | Mu misozi miremire | 1800-3000 | KSC |
| 17 | H629 | Mu misozi miremire | 1800-3000 | KSC |
| 18 | PAN 691 | Mu misozi miremire | 1700-2600 | PANNAR |
| 19 | SC719 | Mu misozi miremire | 1700-2200 | Seed Co |
| 20 | WH 605 | Mu misozi miremire | 1700-2800 | WSC |

Icyitonderwa:

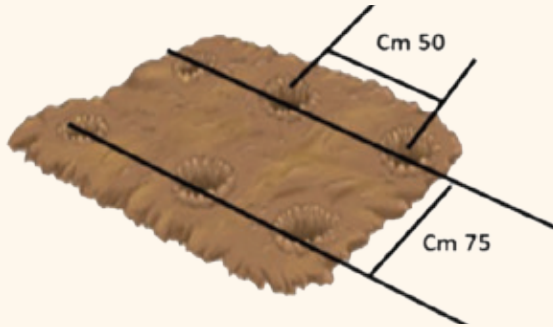
Aya moko yamazwa ni hiburide, ahingwa igihembwe cyimwe, igihembwe gikurikiye ho ukajya gushaka imbuto nshyashya ku bacuruzi b'inongeramusaruro bemewe. Kwitoranyiriza imbuto mu murima birabujijwe.

4. Uko bategura umurima

Kubanza kurima no gukura mu murima ibyatsi, ibishyitsi n'ibisigazwa by'ibihingwa byose. Hanyuma gutabire neza uringaniza intabire.

5. Uko batera

Guca imirongo n'utwobo two gutera, hagati y'umurongo n'undi hakaba cm 75 no hagati y'akobo n'akandi hakaba cm 50. Gushyira impeke ebyiri mu kobo. Bitryo, kuri hegitari haterwa imbuto inga na kg 25 cyangwa kuri ari haterwa kg 0,25. Gukoreshe imbuto ifite ubuziranenge, wavanye ku bafite uruhushya rwo gutubura no gutanga imbuto nk'Abacuruzi b'inyongeramusaruro. Wirinde gukoresha imbuto zidafite icyemezo cy'ubuzirange cyangwa wisaruriye mu mirima wawe mugihembwe cyihinga gishize.



6. Akamaro ku gutera ku mirongo

- Gukoresha imbuto ibazwe kandi ijyanye n'ubuso bwo gutera;
- Bituma ibihingwa bitarwanira imirasire y'izuba n'imyunyu ngugu iri mu butaka;
- Bituma hasigara umwanya wo gukoreramo imirimo itandukanye nko kubagara, kuhira, gutera imiti no kongera mo ire.

7. Gushyiramo ifumbire mborera

Gukoresha ifumbire mborera ingana na toni cumi kuri hegitari. Gucukura utwobo two gutera dufite nka cm 10 z'ubujyakuzimu. Gushyira muri buri kobo ifumbire y'imborera iboze neza ingana n'amashyi abiri kugeza nko kuri cm 5 z'ubujyakuzimu

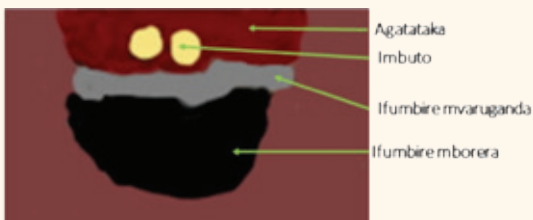


8. Gushyiramo ifumbire mvaruganda

Ifumbire zikunze gukorshwa igihe cyo gutera ibigori ni DAP (18-46-0) ivanze na ire (46-0-0), NPK (17-17-17) na CEREALS (23-10-5+2Mg+3S+0.3Zn). Iyo uhisemo gukoresha DAP ivanze na ire, uvanga kg 100 za DAP na kg 50 za ire, ugatera iyo mvange kuri hegitari imwe cangwe ukavanga kg 1 ya DAP na 0,5 kg ya ire ugatera iyo mvange kuri ari imwe. Bityo ukaba ukoresheje kg 41 by'umunyu ngugu wa azote (nitrogen) na kg 46 by'umunyu ngugu wa fosifore (phosphorus) kuri hegitari . Iyo uhisemo gukoresha NPK (17-17-17), utera kg 250 kuri hegitari imwe cyangwa kg 2,5 kuri ari imwe. Bityo ukaba ukoresheje kg 42,5 by'umunyu ngugu wa azote, kg 42,5 by'umunyu ngugu wa fosifore na kg 42,5 by'umunyu ngugu wa potasiyumu (potasium). Iyo uhisemo gukoresha CEREALS (23-10-5+2Mg+3S+0.3Zn), utera kg 200 kuri hegitari. Bityo,

ukaba ukoresheje kg 46 by'umunyu ngugu wa azote, kg 20 by'umunyu ngugu wa fosifore na kg 10 by'umunyu ngugu wa potasiyumu. Kandi hiyongeraho iyi myunyu ngugu ikoresheya ku rugero ruto n'ibihingwa: kg 4 by'umunyu ngugu wa managanese, kg 6 by'umunyu ngugu wa sirifire na kg 0,6 by'umunyu ngugu wa zenke.

Iyo ukoresheje DAP (18-46-0) ivanze na ire (46-0-0) mu gihe cyo gutera, ushyira mu kobo ko gutera ivange ingana n'agafuniko kamwe n'igice. Iyo ukoresheje NPK (17-17-17), ushyir1 muri kobo ifumbire ingana n'udufuniko dutatu twa fanta. Naho wakoresha CEREALS igihe cyo gutera, ushyira mu kobo ko gutera udufuniko tubiri twa Fanta. Ushyira ifumbire mvaruganda hejuru y'ifumbire, hanyuma ukarenza ho agataka kugirango ifumbire mvaruganda ntize gutwika impeke, ugasigaza ubujyakuzimu bungana na cm3 zo gutera mo imbuto. Warangiza ukarenza ho agatka ukaringaniza umurima.



9. Kubagara

Kubagara ibigori ni ugukura mu murima ibyatsi byose igihe cyose bikuriye, no gukuramo ibindi bihingwa byose byimejeje harimwo n'ibigori byimejeje. Bikorwa igihe cyose ibyatsi cyangwe ibindi bihingwa byimejeje bigariye mu murima kugeza igihe ibigori bimaze kwera hasigaye nk'ibyumweru bibiri ngo bisarurwe. icyatsi cya Striga, abahinzi bita "Bariyentaraza" cyangwe "Kurisuka" ni icyatsi kibi cyane kuko nta mizi gifite, bitryo kigakoresha imizi y'igihingwa. Iyo kigaragaye mu murima, ni ukugukuramo gitangiye kuramya, kitarazana imbuto kuko zishobora kumara imyaka makumyabiri mu butaka ziterege igihingwa ngo zimere.



10. Kongera ire cyangwa AMIDAS

Iyo wakoreshije DAP (18-46-0) + ire (46-0-0) cyangwa NPK (17-17-17) mu gutera, wongeramo ire nyuma y'imyumweru bitandatu mu misozi migufi n'imisozi iciriritse cyangwa birndwi mu misozi miremire umaze gutera. Iyo wakoreshije CEREALS ((23-10-5+2Mg+3S+0.3Zn) mu gutera, wongeramo AMIDAS (40% N + 14% SO₃) nyuma y'imyumweru bitandatu mu misozi migufi n'imisozi iciriritse cyangwa birndwi mu misozi miremire umaze gutera. Mu kongeramo ifumbire mvaruganda, uca akorongo k'uruziga kuri cm 10 kazungurutse buri kigori, gafite nk'ubujyakuzimu bwa cm 2, ushyiramo ire cyangwe AMIDAS wapimishije agafuniko kamwe ka fanta. Ubwo uba wongeyemo kg 50 za iri cyangwa kg 50 za AMIDAS. Bitryo uba wongeyemo kg 23 z'umunyu ngugu wa azote iyo wakoreshije ire, cyangwa kg 20 z'umunyu ngugu wa azote na kg 7 z'umunyu ngugu wa sirifire iyo wakoreshije AMIDAS. Urangije, uhita usukira umurima wose.

11. Gusura umurima

Guhore usura umurima wawe nka kabiri mu cyumweru kugirango umenye neza ibibazo bihari no kubyirinda.

12. Indwara n'ibyonyi by'igihingwa cy'ibigori

A. Cyumya y'ibigori cyangwa Kirabiranya y'ibigori (Maize Lethal Necrosis)

Indwara ya Cyumya y' ibigori iterwa n'uruhurirane rwa virusi ebyiri, ariko iyi ingenzi ni *Maize chlorotic mottle virus (MCMV)*. Iyi virusi iyo ihuye nimwe muri izi zikurikira: *Sugarcane mosaic virus (SCMV)*, *Wheat Streak Mosaic Virus (WSMV)* cyangwa *Maize Dwarf Mosaic Virus (MDM V)* nibyo bitera indwara ya Cyumya y'ibigori. Kirabiranya y'ikigori igira ubukana bwinshi kurusha izindi ndwara zose z'ibigori kandi igabanya umusaruro kugeza ku gipimo cy'100% iyo itarwanyijwe.

Ibimenyetso biranga indwara ya Kirabiranya

- Amababi y'ikigori cyafashwe ahinduka umuhondo, akuma ahereye ku mpande z'ikibabi, kuma bigana imbere cyangwa akuma ahereye ku mwumba.
- Umuheko w'ikigori cyafashwe n'uburwayi ugaragara nk'aho ikigori cyeze, nyamara iyo uwuvanyeho ibishishwa usanga impeke zikiri mbisi, hanyuma aho kwera zikabora.
- Umuheko ugaragara nk'aho harimo impeke, ariko uvanyeho ibishishwa ugasanga nta mpeke zirimo cyangwa ari nke cyane.



Uburyo bwo kuyirinda no kuyirwanya

- Guhinga imbuto ifite icyemezo cy'ubuziranenge;
- Gusimburanya ibigori n'ibindi bihingwa bitari ibinyampeke nk'ibirayi, ibishyimbo, bituma iyo virusi igabanuka mu murima,
- Guhingira igihe no guterera rimwe (synchronized planting) bitryo ntikomeze kubaho ibigori mu murima igihe cyose;
- Kurandura no kuvana mu murima ibigori bigaragaza ibimenyetso maze bigatabwa mu cyobo kirekire gifite byibuze metero imwe y'ubujyakuzimu,
- Kwirinda gutwara ibigori cyangwa ibikomoka ku bigori byasaruwe mu murima wagaragaje uburwayi ubivana mu gace kamwe ubijyana mu kandi haba mu gihugu cyangwa hanze yacyo.

B. Ingenge z'amabara (Maize streak virus)

Indwara y'ingenge z'amabara cyangwa indwara y'imirongo (Maize Streak Virus disease) n'indwara yo mu bwoko bw'amavirusi ikwirakwizwa n'agakoko kitwa **Cicadulina mbila (Naude)**. Ibigori cyafashwe kirangwa n'imirongo y'amabara yegeranye kandi iteganye igenda ikurikira imigongo mito y'ikibabi. Ibyo bimenyetso kandi bitangirirra ku biba byo hejuru bikagenda bimanuka ku bibabi byo hasi.



Uburyo bwo kuyirinda

- Gukoresha amoko y'imbuto y'ibigori azafatwa n'iyi ndwara;
- Kurandura no gukura mu mirima ibigori byafashwe n'ubwo burwayi.

C. Kubabuka kw'amababi (Turcicum Leaf Blight or Northern Leaf Blight)

Indwara yo kubabuka kw'amababi iterwa n'agahumyo kitwa *Exserohilum turcicum* [(Pass.) K.J. Leonard & Suggs]. Iyo igitangira irangwa n'utudomo tuza ku mababi hanyuma tukagenda dukura tugafata igice kinini k'ikibabi. icyo gice cyafashwe kikagaragara gisa nk'aho cyababutse. Amababi yo hasi niyo abanza gufatwa hanyuma ibimenyetso by'uburwayi bikagenda birushaho kugaragara uko ikigori gikura. Kurwanya kubabuka kw'amababi ni ugukoresha imbuto zidafatwa n'iyi ndwara.



D. Kubora k'uruti rw'ikigori (Stalk rot)

Indwara yo kubora k'uruti rw'ikigori iri mu bwoko bubiri: Diplodia stalk rot na Fusarium stalk rot. Diplodia stalk rot iterwa n'agahumyo kitwa *Stenocarpella maydis* (Berk.) B. Sutton, naho Fusarium stalk rot iterwa n'agahumyo kitwa *Fusarium verticillioides* J. Sheld. Indwara yo kubora rw'uruti rw'ikigori itangira amababi ahindura ibara

agahinduka umuhondo werurutse iyo ari fusarium stalk rot cyangwe agasa n'igijuju iyo ari diplodia ear rot. Hanyuma ububore bugatangira ku ngingo z'ikigori, bukagenda bikwira hagati y'ingingo zikurikiranye kuburyo uruti rw'ikigori nta mbaraga riba rufite, akantu gato kagikoze ho ikigori gihita kigwa. Kwirinda iyi ndwara ni ugusimburanya ibigori n'ibindi bihingwa nk'ibinyamisogwe n'ibinyabijuma no gukura ibisigazwa by'ibigori mu murima igihe umaze gusarura.



E. Kubora kw'amahundo y'ibigori (maize ear rot)

Indwara zo kubora kw'amahundo y'ibigori ziri ubwoko bwinshi ariko iz'ingenzi ni "diplodia ear rot" iterwa n'agahumyo kitwa *Stenocarpella maydis* (Berk.) B. Sutton, "fusarium ear rot" iterwa n'agahumyo kitwa *Fusarium verticillioides* J. Sheld naho "gibberella ear rot" iterwa n'agahumyo kitwa *Gibberella zeae*, (Schweinitz) Petch. Ubwoko bwa "diplodia ear rot" bugaragazwa n'uruhumbu rusa n'ikijuju cyangwa igihogo hagati y'impeke no ku mpeke ku gice cy'ihundo cyane cyane igice cyo ku ndiba n'igice cyo hagati. Ubwoko bwa "fusarium ear rot" bugaragazwa n'uruhumbu rusa n'igihogo cyangwe se rwerurutse ruri ku mpeke ziri hirya no hino kw'ihundo, cyangwe ku mpeke ziri hamwe mu gace k'ihundo. Ubwo bwoko kand bushobora no kugarazwa n'uturongo tw'uruhumbu tw'umweru turi ku mpeke. Ubwoko bwa "gibberella ear rot" bugaragazwa n'uruhumbu rusa n'igaju cyangwe n'umutuku werurutse rutangirira ku mutwe w'ihundo rukamanuka rukya kagati. Indwara yo kubora kw'amahundo y'ibigori irwanywa mu gusimburanya ibigori n'ibindi bihingwa nk'ibinyamisogwe n'ibinyabijumba, gukura mu murima amahundo arwaye, gusarura hakiri kare ibigori bimaze kwera no kumisha neza amahundo n'impeke.



F. *Bariyentaraza cyangwe Kurisuka (Striga spp)*

Bireyentaraza cyangwe Kurisuka ni icyatsi gitagira imizi kisungwa imizi y'igihingwa cyane cyane ibinyampeke nk'ibigori n'amaska. Mu Rwanda haboneka ubwoko bubiri bwa Bariyentaraza aribwo *Striga hermonthica* (Del.) Benth na *S. asiatica* (L.) Kuntze. *S. Hermonthica* igaragaraga mu Turere twa Nyagatare, Gatsibo, Kayonza na Ngoma, no mu Mayaga. *S. asiatica* igagara mu Karere ka Bugesera naho zombi zikagagaraga mu Karere ka Kirehe. *S. hermonthica ifite ururabo* rusa n'igaju (pink) naho *S. asiatica ifite ururabo rutukara* (red). Bariyentaraza iboneka ku bigori no ku masaka. Striga, itwara imyunyu ngugu n'imirasire y'izuba yari gukoreshwa n'igihingwa ku buryo usanga ari yakuze yonyine.

Uburyo bwo kuyirwanya:

1. Kurandura Bariyentaraza itarazana ururabo, cyangwe ururabo rutangiye kuza, ariko imbuto zitaraza mu rurabo kuko imbuto zayo zishobora kumara imyaka makumyabiri bigitegereje igihingwa;
2. Gusimburanya ibinyampeke n'ibinyamisogwe cyangwe ibinyabijumba;
3. Gukoreshwe ifumbire mborera ndetse n'ifumbire mvaruganda;
4. Kwirinda kunyuzwa amatungo mu murima wagaragayemo Bariyentaraza kuko ashobora kuyijyana mu yindi mirima.



G. *Nkongwa [African maize stalk borer or Busseola fusca (Fuller)]*

Nkongwa [African maize stalk borer or *Busseola fusca* (Fuller)] ni icyonyi kari mu bwoko bw'ibinyugunyugu, ariko igishorobwa (larvae) cyayo ni cyo cyangiza ibihingwa. Igishorobwa gitobagura amababi nyuma kakinjira mu ruti rw'ikigori, hakagaragara ifu cyacye imyenge. Kinjira mu ruti rw'ikigori, kigagenda kirya iby'imbere mu ruti, kand kigaca mo umuhora. Iyo usatuye uruti rw'ikigori cyafashwe, usangamo igishorobwa kimeze nk'urunyo. Uruti rw'ibigori byafashwe nta mbaraga biba bigifite ku buryo bishobora kuvunika no kugushwa n'umuyaga.



Uburyo bwo kurwanya nkongwa

- Gusimburanya ibigori n'ibinyamisogwe cyangwa n'ibinyabijumba bigabanya ikwirakwira rya nkongwa;
- Gufumbira ubutaka hakoreshejwe ifumbire y'imborera
- Kugenzura umurima bihoro bifasha kurwanya ikibazo hakiri kare.
- Kuvanga ibigori n'urubingo cyangwa desimodiyumu mu rwego rw'ubwoko gukumira nkogwa
- Isuku y'umurima: Gutaba ikigorigori nyuma yo gusarura cyangwa bikagaburirwa amatungo
- Mu gihe ibigori byafashwe birenze 10%, ushobora kurwanya nkongwa ukoresheje imiti nka lambda-cyhalothrin, cypermethrin+profenofos (roket) ku rugero rwa 15ml/ litiro 15 z'amazi.

H. Nkongwa idasanze (*fall armyworm*)

Nkongwa idasanze [Fall Armyworm *Spodoptera frugiperda* (J.E. Smith)] ni icyonnyi kitari gisanze mu Rwanda, cyaje mu mwaka 2017, kiri mu bwoko bw'inyugunyugu. Igishorobwa cyacyo ni cyo cyangiza ibihingwa cyane cyane ibigori.

Nkongwa idasanze irangwa n'ibi bikurikira: ku mutwe hagaragara ishusho y'inyuguti ya "Y", utwoya twirabura tugaragara ku mubiri wayo, umurongo mugari ubengerana uri ku mugongo uvuye ku mutwe ugana inyuma ukikijwe n'uturongo twirabura kumpande zawo n'ibidomo bine bikoze ishusho ya "mpandenye ndinganire" ahagana inyuma.

Nkongwa itangira yangiza amababi akiri mato iharura nyuma ikajya mu mwumba. Iyo ikuze ica imyenge ku mababi igakata n'umwumba, ari nako igenda isiga umwanda wayo ku mababi umeze nk'ifu itose. Iyo umwumba wariwe cyane byangiza imikurire y'igihingwa n'umusaruro ukagabanuka.

Uburyo bwo kurwanya nkongwa idasanzwe

- Guhinga ugeza isuka hasi ugamije kugaragaza, kuvanamo cyangwa gutaba nkongwa
- n'ibikonoshwa byayo;
- Kongerera ibihingwa ubudahangarwa hakoreshwa ifumbire y'imborera iboze neza n'imvaruganda ku bipimo nyabyo hamwe no kuhira;
- Gusimburanya mu murima ibinyampeke n'ibinyamisogwe nk'ibishyimbo na soya cyangwa n'ibinyabijumba nk'ibirayi n'ibijumba;
- Gutoragura ibishorobwa bya nkongwa idasanzwe mumurima no kubyica;
- Gukoresha umuti wica udukoko utera cyane cyane mu mwumba nka:
 - Cypermethrin 4%+profenofos 40% (roket, target, cypro, jacket) ku rugero rwa 1-2 ml z'umuti muri 1l z'amazi,
 - Lambda-Cyhalothrin 50g/l, ku rugero rwa 1-2 ml z'umuti muri 1l z'amazi;
 - Pyrethrum 5% EWC, ku rugero rwa 8ml muri 1l y'amazi.
 - Acetamidrid 20g/l + Lambda-Cyhalothrin 16g/l, 4-6ml muri 1l y'amazi.



Ibishorobwa byigukura



Ibishorobwa kimeze gukura



Igikongoshwa



I. Imungu (maize weevil)

Imungu [maize weevil, *Sitophilus zeamais* (Motschulsky)] ni agasimba kangiriza ibigori mu bigega no mu bubiko. Imungu ikuze ifite uburebure buri hagati ya cm 3 na cm 3,5 kandi isa n'umukara cyangwe se igihogo kijimye. Ku gice cy'igituza (thorax) cyayo hagara utuntu tumeze nk'udutobore. Utwo tuntu tumeze nk'udutobora tugaragara kandi dutonze umurongo ku dusanduka tubika abababa (elytra) kandi dutwikiriye igihimba k'inyuma (adomen). Utwo dusanduka tubika amababa dufite utudomo tw'umutuku wijimye cyangwe oranje yijimye. Imungu kandi ifite umunwa muremure usongoye, n'amahembe atereye ku ntugu. Amhembe afite ingingo umunani. Igishorobwa cy'imungu gisa n'umweru kandi nta maguru gifite. Imungu n'icukura imyobo mu mpeke ikinjiramo, ikarya iby'imbere byose, igisiga gusa agahu k'inyuma rimwe na rimwe kariho ifu yera y'uwanda wayo. Iyo uyize impeke mu maze, impeke zose zireremba ziba zariwe n'imungu.

Uburyo bwo kurwanya imungu

- Gusarura ibigori bamaze kwera, ntibitinde mu murima, koku ishobora kutangira kwangiza umusaruro;
- Kumisha neza ibigori umaze kubisarura, byaba nagomba waramaze ugasubira ukambumisha kuburyo ugera ku buhehere mu mpeke buri hagati ya 12 % na 14 %;
- Guhuunika umusaruro ahantu habugenewe, hafite isuku, nta mpeke z'ibigori zindi cyangwe se impeke z'ibindi bihingwa zihari, nta mukungu, umusenyi n'ibindi byose bishobora gutea umwanda
- Gukoresha imiti yica imungu n'ibishorobwa byayo ukurikiza amabwiriza yose aba ari kumwe n'umuti wahisemo.
- Imwe mu muti wakoresha yemewe mu Rwanda ni iyi:
 - Malathion 2% w/w, Dust
 - Malathion 2.0% w/w + Permethrin 0.3% w/w
 - Profenofos, 40%EC; 50%EC
 - Pyrethrins, 75%w/w EC
 - Pymiphos-Methyl 400g/l + 75g/l Permethrin, EC
 - Pymiphos-methyl, 2 % PP Dust
 - Aluminium phosphide (PH₃), 56%, 57% pills, tablets and plates for fumigation



J. *Kanyugunyugu (Angoumois grain moth)*

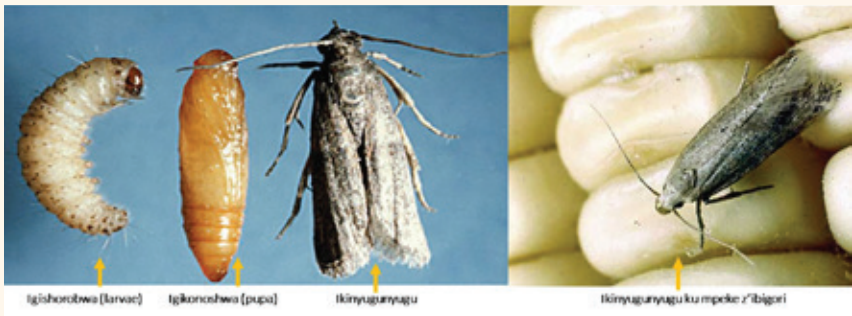
Kanyugunyugu (Angoumois grain moth, *Sitotroga cerealella* Olivier) ni agasimba kari mu bwoko bw'ibinyugunyugu kagiriza ibigori mu bigega no mu mu biko. Akanyugunyugu ka "Angoumois grain moth" ni gato cyane kareshya na mm 5 kugeza kugeza kuri mm 7, ariko gapimwe amababa arambuye kageza kuri mm 20. Umutwe (head) n'igituza (thorax) n'amahembe (antennae) ameze nk'urushinge asa n'igihogo cyijya kweruruka. Amababa y'imbere ni maremare, asa n'igohogo cyijya kweruruka cyangwe n'umuhondo wijimye kandi afite utudomo tujya kwirabura. Igihimba cy'inyuma (abdomen) gisa n'igihogo. Amajyi ariburungushuye, asa n'umweru iyo ikinyugunyugu kikiyatera agahita ahindura ibara agasa n'umutuku. Igishorobwa (larvea) cyayo gikurira mu ruheke rumwe, gisa n'umuhondo werurutse, umutwe wacyo usa n'umutuku werurutse kandi umuze nkaho winjiye mu mubiri.

Igishorobwa cya "Angoumois grain moth" nicyo cyagiza impeke cyane kuko ikinyugunyugu gitera amgi mu twenge duto kiba cyaciye ku buri ruheke. Igi rimwe kuri ruheke rikavamo igishorobwa kimwe. Uko gikura karya iby'imbere byose biri mu ruheke. Imbere y'uko kiva mo igikonoshwa kigaca akobo gato gasohoka hanze hanyuma kigahita kiba igikonoshwa. Igikonoshwa kirakura nko mu minsi 10 hanyuma kikavamo ikinyugunyugu. icyo kinyugunyugu kigahita gisoka giciye mur ka kabo gaciye n'igishorobwa imbere y'uko kiba igikonoshwa. Impeke zariwe n'igishorobwa ziba zifite umwuka unuka.

Uburyo bwo kurwanya Kanyugunyugu

- Kumisha neza ibigori umaze kubisarura kuburyo ugera ku buhehere mu mpeke buri hagati ya 12 % na 14 %;
- Guhunika umusaruro ahantu habugenewe, hafite isuku, nta mpeke z'ibigori zindi cyangwe se impeke z'ibindi bihingwa zihari, nta mukungu, umusenyeri n'ibindi byose bishobora gutea umwanda;
- Gukuraho ibyatsi byaba biri hafi y'ubuhunikiro;

- Buri cyumweru kugeza ku byumweru bibiri, gusura ubuhunikiro, ukareba niba na twenge turi ku mpeke;
- Gukoresha imiti yica udusimba two mu buhunikiro kandi ukurikiza amabwiriza yose aba ari kumwe n'umuti wahisemo.
- Imwe mu muti wakoresha yemewe mu Rwanda ni iyi:
 - Malathion 2% w/w, Dust
 - Malathion 2.0% w/w + Permethrin 0.3% w/w
 - Profenofos, 40%EC; 50%EC
 - Pyrethrins, 75%w/w EC
 - Pyrimiphos-Methyl 400g/l + 75g/l Permethrin, EC
 - Pyrimiphos-methyl, 2 % PP Dust
 - Aluminium phosphide (PH₃), 56%, 57% pills, tablets and plates for fumigation



13. Gusarura

A. Kwera kw'ibigori

Ibigori bigeze igihe cyo gusarurwa birangwa n'ibi bikurikira:

- Biba bimaze hagati y'amezi 4 na 7 bitewe n'ubutumburuke
- Ibishishwa byabyo bihindura ibara bigasa na kaki
- Amahundo y'ibigori atangira gucurama
- Impeke ziba zikomeye zidashobora gupfumurwa n'urwara kandi zuzuye ifu



B. Uburyo bwo gusarura

Mu gusarura, amahundo avanwa ku bigorigori akagumishwaho ibishishwa cyangwa bikavanwaho bitewe n'ubwanikiro buzakoreshwa, kandi bigomba gusarurirwa mubikoresho bifite isuku kandi hirindwa ko byahura n'ubutaka.

C. Uburyo bwo gutwara ibigori biva mu murima

Mu gutwara ibigori biva mu murima, hakoreshwa uburyo butandukanye, ariko ni ngombwa kwitwararika kugira ngo impeke zitangirika, kubitwara mubikoresho bifite isuku kandi bidashaje, ikindi ningombwa kwirinda ko ibigori bitanyagirwa cyangwa ngo bihure n'igitaka.

D. Kwanika

Kubera ko ibigori biva byasaruwe bitumye neza, ni ngombwa kubyanika kugira ngo byume neza ushobora kwifashisha ibikoresho bitandukanye nk'igisharagati, imbuga yabugenewe, kumabaraza y' inzu, kubirago, shitingi.

Icyitonderwa:

1. Kirazira kwanika ibigori kurusenge kuberako byangiza ubwiza bw' umusaruro
2. Ibigori bigomba kwanikwa kubikoresho bifite isuku kandi hakirindwa ko byahura n' ubutaka.



Hari nubundi bwoko bwa shitingi bwanikwaho ibigori bwitwa Collapsible Dryer. Iyi shitingi iba ifite ibara ry'umukara, iryo bara nkuko tubizi rikurura izuba cyane iyo wanitseho rero byuma vuba cyane. Ikindi iyi shitingi iba ifite ibice bibiri bihuzwa n'imashini kuburyo iyo wanitse imvura ikagwa uhita utwikira ugafunga ukaza kubyara nyuma imvura ihise. Ikindi iyi shitingi yanikwaho ibigori byinshi ugereranyije nizingi zisanzwe.



Solar dryer

E. Guhungura

Mugihe cyo guhungura ibigori bigomba gukoranwa ubushishozi hirindwa ko intente zimeneka, ushobora gukoresha intoki cyangwa imashini zabugenewe ningombwa ko mbere yo kugura imashini ihungura ugomba kubanza kumenya ko ifite ubuziranenge bityo bikakurinda kwangiza umusaruro.

Icyitonderwa:

Kirazira guhurira ibigori mu mifuka kubera ko byangiza cyane umusaruro kubera kumenagura intete



✓ **Gutoranya umusaruro**

Hashobora gukorwa ibi bikurikira:

- Gukuramo imyanda yose, umukungugu, amabuye, igitaka, ibyatsi n'ibindi
- Gukuramo izindi mbuto zitari ibigori
- Gukuramo imbuto zangiritse: izangirikiye imbere cyangwa zahinduye ibara
- Gukuramo izakomeretse inyuma
- Gukuramo intete zihinyagaye
- Gukuramo intete zangijwe n'imungu cyangwa utundi dukoko



F. Guhunika

a. Guhunika ibigori bikorwa mu buryo bwitondewe hitabwa ku bintu by'ingenzi bikurikira

- Guhitamo aho guhunika:
 - Hagomba kuba Kuba hatanyagirwa cyangwa ngo harekemo amazi
 - Kuba hatari ubuhehere bwinshi
 - Hashobora kwinjiza umwuka
 - Kuba hatari ibyonyi nk'imbeba, imiswa n'ibindi
- Gusukura aho guhunika no kuhatera imiti
- Guhitamo uburyo bwo gupanga imifuka
- Gusukura imyaka no kureba niba yumye neza ikaba ifite ubuhehere bwa 13%
- Gusukura imifuka
- Gutandukanya sitoki y'imyaka ishaje n'imishya
- Kutarambika imifuka hasi hagakoreshwa imbaho cyangwa amabuye.

b. Ibintu by'ingenzi bigira uruhare runini mu kwangirika kw'imyaka

- Kuba imyaka itumye neza mu gihe cyo kuyihunika
- Kuba ahahunikwa hari ubuhehere bwinshi
- Ubushyuhe bwinshi mu buhunikiro
- Uburyo wapanze imifuka mu buhunikiro
- Isuku nke mu buhunikiro
- Kudahungira imyaka ku gihe

c. Uburyo bunyuranye bwo guhunika



B. INGANO



1. Aho ingano zihingwa:

zihingwa cyane mu misozi miremire yo mu turere tw'Amakoro, Buberuka no mu karere k'Isunzu rya Kongo Nile, ndetse no misozi iciriritse.



Uturere duhinga cyane ingano mu Rwanda turiho akaziga

2. Ubutaka:

Ingano ni igihingwa gikunda ubutaka bw'isi ndende bufite ifumbire y'imborera ihagije kandi buhitisha amazi.

3. Amoko yamamazwa:

Hari Nyaruka (Eagle 10), Kibatsi (EN 161), Nyangufi (EN 48), Majyambere, Mizero, Cyumba, Rengerabana, Gihundo, Reberaho, Keza, Njoro BW II na Chozi.

4. Gutegura umurima

Imirimo isabwa :kurwanya isuri, kurima bwa mbere mu gihe haraye no kurima bwa kabiri ari byo gutabira no kuringaniza intabire mbere yo gutera imbuto.

5. Gufumbira:

- Bakoresha hagati ya toni 20 na 30 z'ifumbire y'imborera iboze neza nibura ibyumweru bibiri mbere yo kubiba.
- Bongeramo ifumbire mvaruganda kg 100 za DAP kuri Hegitari. Iyo fumbire ivangwa n'imbuto mbere yo gutera.
- Nyuma y'ibyumweru 3 kugera kuri 6, bongeramo 50 kg za urea kuri Ha.
- Mu butaka busharira babanza gushyiramo hagati ya toni 2 kugeza kuri toni 2.5 z'ishwagara kuri Ha nibura ibyumweru 2 mbere yo gutera. Ishwagara imara mu butaka ibihembwe bine by'ihinga (4 seasons) mbere yo kongeramwo indi.

6. Igerambuto

- Umuhinzi akoresha Kg 100 z'imbuto y'ingano kuri Ha. Atera amisha ku mirongo itandukanyijwe na cm 20 hagati y'imirongo Batera muri Nzeri mu gihembwe cy'ihinga A no muri Werurwe mu gihembwe cy'ihinga B.



7. Gufata neza ingano mu mirima

Mu mirimo y'ingenzi twavugaga kumenera nyuma y'ibyumweru 2 kugeza 3 ingano zimeze, kubagara no gusukira igihe cyose bibaye ngombwa kugeza ihundo rimaze kuzura, kurwanya indwara n'ibyonnyi hakoreshajwe amoko yihanganira indwara, gutera imiti, imitego y'imbeba n'amafuku, kwamurura inyoni n'ubundi bwose bushoboka.



Kubagara ingano

8. Ibyonnyi n'indwara by'ingenzi byangiza ingano

A. Umugese w'umuhondo (Wheat yellow/stripe rust)

Ibimenyetso

Indwara irangwa n'ifu y'umuhondo werurutse cyangwa ujya kuba oranje. Iyo fu iba itondetse mu turongo duto, twegeranye, kandi dutadunkanye mu burebure. Ifu igaragara akenshi ku mababi, rimwe na rimwe ikaboneka ku mahundo, ku nkondo y'ihundo no ku bikobokobo by'amababi. Uburwayi bukabije butera igwingira ry'igihingwa, kuma kw'amababi akuma, n'igabanuka rikabije ry'umusaruro.



Iyi ndwara ikunze kuboneka mu gihe cy'ubuherehe buri hejuru ya 70% buvanze n'ubushyuhe buri hagati ya degere 10-20, ubwinshi bugera kuri 25.

Uko indwara ikwirakwira

Aka gahumyo gashobora gutwarwa n'umuyaga, ukakageza ku ntera ndende aho gashobora gutera uburwayi ku zindi ngemwe. Gashobora kandi gukwirakwizwa n'imyenda, intoki n'inkweto by'abagendagenda mu murima w'ingano. Imvura cyangwa ikime byihutisha gufatwa kw'igihingwa n'uyo ndwara.

Uburyo bwo kuyirinda no kuyirwanya

- Gutera ingano zihanganira iyi indwara kandi kare
- Kurandura ingano za kimeza ziboneka hagati y'ibihembwe by'ihinga
- Gusimburanya ingano n'ibindi bihingwa
- Gutera umwe mu miti ikurikira :
 - ✓ Tebuconazole nka Orius: 30ml/L 20 y'amazi
 - ✓ Copper Oxychloride (Nordox, Funguran): g 30/L 20 y'amazi.

B. Umugese w'umukara (Wheat black/stem rust)

Ibimenyetso

Indwara irangwa n'ibidomo/ibituri ku ruti, mababi, ku kivovo/ingobyi y'ikibabi no ku mahundo iyo ikabije kuba nyinshi. Ibidomo bigira ibara ry' umutuku ujya kuba ikigina, bikagenda bihinduka umutuku weruye, ikiginda kijimye, nyuma bigahinduka umukara. Ahafashwe n'uyo ndwara harahanda. Indwara itubya umusaruro ku gipimo gishobora no kurenga 70%.



Uko indwara ikwirakwira

Indwara iterwa n'agahumyo gakwirakwizwa n'umuyaga. Indwara igira ubukana mu gihe cy'amanya ashushye n'ubuherehere buhagije bwa nijoro. Umuyaga ushobora gukwirakwiza icyorezo kugeza ku ntera ndende cyane. Imvura igira uruhare runini mu gutuma agahumyo gafata ku gihingwa. Agahumyo gashobora kumara umwaka ku myaka irwaye, ku ngano kimeza cyangwa ibindi bimera bifitanye isano n'ingano.

Uburyo bwo kuyirinda no kuyirwanya

- Guhinga imbuto zihanganira indwara kandi hakiri kare.
- Gukoresha ifumbire ikwiye ku bipimo bikwiye kandi ku gihe.
- Kurandura kimeza buri gihe.
- Kugabanya urujya n'uruza rw'abantu mu murima w'ingano.
- Kubagara igihe cyose ari ngombwa.
- Gusimburanya ingano n'ibindi bihingwa.
- Gutera umuti wa tebuconazole uvangwa ku gipimo cya mililitiro imwe (1) kuri litiro imwe (1) y'amazi. Umuti uterwa mu gihe cy'iterera, mbere y'uko indwara igaragara.

C. Uruhumbu (*Wheat powdery mildew*)

Ibimenyetso

Indwara irangwa n'ifu y'ikijuju, isa n'ivu. Uruhumbu rugaragara cyane cyane ku ruhande rwo hejuru rw'amababi, ku kivovo/ingobyi y'ikibabi no ku bishishwa by'impeke ndetse no ku mahundo. Nyuma yo gutuma ivu ryeruruka, amababi yafashwe ahinduka umuhondo, nyuma akuma. Iyo indwara ifite ubukana bwinshi, igihingwa kiragwa kubera intege nke, ikitarakura bihagije kikagwingira, impeke ntizizakomere, ahubwo n'izigerageje gukomera zigapfunyarara. Indwara ishobora gufata ingano igihe icyo ari cyo cyose kuva zikiri ingemwe kugeza ziri hafi kwera. Uruhumbu rutubya umusaruro kugera kuri 45%.



Uko indwara ikwirakwira

Indwara ikwirakwizwa n'umuyaga, kwanduzanya kw'ingemwe ziri mu murima, kimeza n'ibisigazwa by'ingano zirwaye. Ubukana bw'indwara bwiyongera akenshi ku mbuto itihangana, ikirere gifite hejuru ya 85% by'ubutote n'ubushyuhe buri hagati ya 15 na 20, urumuri ruke, azote nyinshi bikabije mu butaka n'ingano zicucitse zibona urumuri ruke.

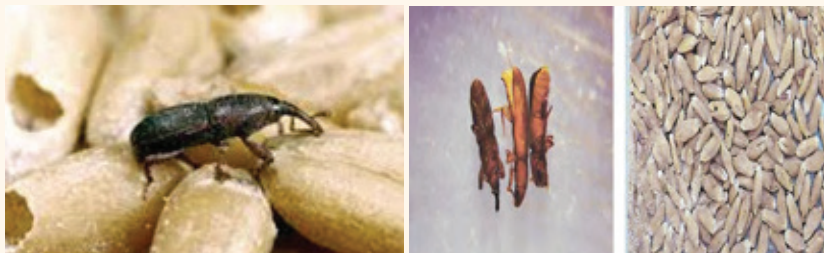
Uburyo bwo kuyirinda no kuyirwanya

- Guhinga imbuto zihanganira indwara.
- Gukoresha ifumbire mvaruganda uko bikwiye, kandi ku gihe.
- Kurandura kimeza buri gihe.
- Kubuza abantu benshi kugendagenda mu murima w'ingano
- Kubagara igihe cyose ari ngombwa
- Gusimburanya ingano n'indi myaka.
- Gutera umuti wa tebuconazole uvangwa ku gipimo cya mililitiro imwe (1) kuri litiro imwe (1) y'amazi.

D. Imungu

Ibimenyetso:

Imungu zitobagura intete zigateramo amagi, zigaturagiramo kandi zigatungwa n'ibirimo imbere. Zimwe muri izi mungu n'ibyana byazo birya intete zamenaguritse n'izangiritse.



Imungu mu ntete z'ingano

Uburyo bwo kuyirinda no kuyirwanya

- Kugirira isuku ubuhunikiro,
- Koresha imifuka ya PICS (Purdue Improved Crops Storage bags) irinda imungu:
- Guhungira intete n'umuti urimo Malathion + Permethrin (nka Super Skana). Vanga g 2.5 z'umuti (Malathion+Permethrin) mu kg 1 cy'imbuto.

E. Inyoni (mu murima)

Ibimenyetso

Inyoni ziryamba imbuto y'ingano yatewe mu butaka mu gihe cy'ibyumweru 2 nyuma y'itera. Inyoni ziryamba kandi n'intete kuva mu iterera kugeza ingano zitangiye kuma. Inyoni zishobora gutubya umusaruro kugeza ku 100% mu gihe umurima utarinze bikwiye.



Inyoni yiteguye kona ingano

Uburyo bwo kurinda no kurwanya inyoni

- Kurinda/kwamurura inyoni mu gihe cy'ibyumweru 2 nyuma y'itera na nyuma y'iterera kugeza ingano zitangiye kuma.
- Guhingira rimwe n'abandi.

9. Igihe yerera :

ingano zera hagati y'iminsi 90 cyangwa 130 bitewe n'ubwoko bwazo.

10. Gusarura (igihe n'uko bikorwa)

Ibintu bikurikira bikwiye kwitabwaho mu gikorwa cyo gusarura:

Ingano zigomba gusarurwa iyo intete zimaze gukomera bihagije. Gutinda gusarura bituma impeke zivaana mu bishishwa zikanatakara mu murima no mu mayira . Ni n'impamvu yokuziteza inyoni n'ibindi byonnyi bitandukanye.



Umurima w'ingano zumye zikwiye gusarurwa

Ingano zisaruwe zigomba kubikwa zitandukanyijwe hakurikijwe amoko yazo.

Uburyo bwo gusarura ingano

Muri rusange ingano zisaruzwa intoki hifashishijwe najoro/akayuya. Basarura batema uduti twazo bagasiga nka santimetero 10 uvuye ku butaka. Hari n' imashini zabugenewe mugusarura ingano. Ingano zisaruwe zihambirwamo imiba mitoya zigatwarwa aho zateguriwe gukorerwa indi mirimo nko guhura no kugosora.



Guhura no kugosora ingano

Igikorwa cyo gutandukanya impeke n'ibishishwa gikorwa mu buryo butandukanye: guhura n'ikibando cyangwa gukoresha imashini. Ikintu cy'ingenzi kigomba kwitabwaho mbere na mbere ni ukumenya igihe nyacyo cyo gusarurira. Iyo habayeho gucyererwa mu gusarura, impeke zirumagara cyane bikazitera kumenagurika mu gihe cyo guhura. Gusarura mbere y'igihe nabyo bituma kwanika bifata igihe kirekire.



Kwanika ingano

- Muri rusange ingano zumira mu murima mbere yo kuzisarura
- Nyuma yo kuzisarura zijyanwa aho zihurirwa. Iyo zimaze guhurwa zongera kwanikwa ku mashitingi asukuye cyangwa ku mbuga zabigenewe.
- Ni ngombwa kwirinda kwanika ingano ku butaka kugira ngo zitandura.
- Igihe imyaka yanitse, hagomba umuntu uba hafi akajya asanza akanatwikira cyangwa akanura igihe imvura iguye. Aba ashinzwe no kujya yirukana ibyonnyi.

Guhunika ingano

Ubuhehere bwemewe mu mpeke z'ingano ni 13.5%, naho ubw'umwuka ukikije aho zihunitse bukaba ku kigero cya 70 ku ijana. Iyo ingano zibikwa igihe gito ubuhehere bw'impeke bwa 13-14% ntacyo buba butwaye. Iyo ari uguhunika igihe kirekire, impeke zigomba kumishwa kugeza kuri 11-12%.

Kugira ngo wizere ko wahunitse neza genzura ibi bikurikira:

- Impeke zigomba kuba zisukuye neza kandi zitoranije
- Zigomba kuba zumye ku kigero gikenewe (12-14%)
- Imyaka ihunitse igomba kurundwa neza n'aho iri hakaba hatewe imiti
- Imyaka ihunitse irindwa kwinjirwamo n'umuyaga ukonje
- Imyaka igomba guhunikwa ahantu humutse neza



C. UMUCERI



1. Aho umuceri ukunda

Mu bishanga by'uturere dushyuha (tw'imirambi n'imisizi iringaniye) kugeza ku butumburuke bwa metero 1500. Mu butaka bw'ibumba n'ubundi bwose budahitisha amazi

2. Amoko yamamazwa:

Zhong Geng, Yun Keng, Yun yin, Yun erthian, Basmati, Facagro, Intsinzi, Gakire, Buryohe, Muturage, Tebuka (Wat 1276 -22-2), Intsindagirabigega (B 24-2), Rumbuka, Nemeyubutaka, Ndamirabahinzi, Mpembuke.

3. Uko bategura ingemwe

- Haterwa hagati ya gr 150 na gr 200 kuri ari 1 ya pepiniyeri bitewe n'ubwoko.
- Bagemura umuceri bawutera ku mirongo itandukanyijwe na cm 20-30 hagati y'akobo n'akandi na cm 20-30 hagati y'imirongo;
- Mu kobo bateramo utugemwe 2 tw'imbuto z'umuceri.

4. Igihe cyo gutera:

Ukuboza-Mutarama (Saison A) Kamena-Nyakanga (Saison B). Ariko mu Bugarama ho ni Nyakanga-Kanama (Saison A) no muri Gashyantare (saison B).

5. Uko bategura umurima:

Imirimo y'ingenzi twavuga harimo kurwanya isuri cyane ku misozi iteganye n'igishanga, kurima ubwa mbere gutegura pepiniyeri, gucoca no gukora puddling (kuvuruga) umunsi umwe mbere yo gutera.

6. Gufumbira:

Kuri Ha 1 bashyiramo kg 200 za NPK 17.17.17 mu gihe cyo gutera na Kg 100 za Ire(urea) aho kg 50 za Ire bazishyiramo nyuma y'ibyumweru 3 bamaze gutera ifumbire ya NPK naho izindi kg 50 za Ire bakazongeramo umuceri utangiye guhagika.

Icyitonderwa:

Mbere yo gushyiramo ifumbire, ni ngombwa kubanza kuvana amazi mu mirima.

7. Gufata neza umuceri mu mirima

Mu mirimo y'ingenzi harimo kubagara inshuro 2 cyangwa 3, gutera umuti wica udukoko nuwo kurwanya indwara, kuhira no gukamura amazi igihe ari ngombwa.

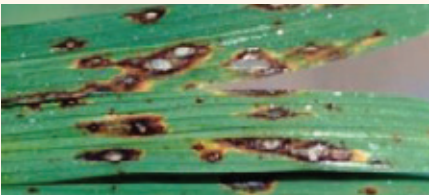
8. Ibyonyi by'ingenzi n'uburyo bwo kubirwanya

A. UBURIMA (Rice blast)

Iyi ndwara iterwa n'agahumyo bita "Pyricularia Oryzae" igafata ingingo zose harimo ibibabi, uruti, indabo n'impeke. Ikunda gukara cyane mu buhumbikiro (pépinière), umuceri ugeze igihe cyo guhagika, guterera n'igihe cyo kurabya. Gukoresha azote nyinshi mu murima, ubushyuhe bwinshi buvanze n'ubutohe bituma iyi ndwara yiyongera.

Ibimenyetso

- Mu buhumbikiro, ingemwe zirashya zikababuka zose,
- Amababi azaho amabara y'ikigina cyijimye aya kuba maremare, asongoye, y'ikijuju hagati,
- Utudomo tw'icyatsi cyenda kuba ikijuju dusa nkaho turimo amazi dufite ishusho y'uruziga cyangwa imeze nk'igi ku mababi,
- Ku mababi ugasangaho ibisebe by'amabara y'ikigina binini, ku mpande hasa n'umuhondo. Iyo amababi yafashwe cyane aruma,
- Iyo indabo zifashwe, ntizera, ntizizana n'imbutu. Iyo imbuto zije, zigira utubara tw'ikigina, kandi zigahinamirana.



Uburima bwo ku mababi



Amahundo arwaye

Uburyo bwo kuyirinda no kuyirwanya

- Gutera imbuto nzima cyangwa zihanganira indwara,
- Gutera imbuto umuti mbere yo guhumbika (enrobage),
- Kubahiriza ibihe by'ihinga,
- Isuku mu murima nahawegereye, gutwika ibikenyeri by'umuceri nyuma yo gusarura,
- Kuyobora amazi ahagije mu murima,
- Gutera ifumbire nyayo ku rugero nyarwo,
- Gukoresha umuti nka Tricyclazole, Tebuconazole, Benomyl.

B. KUBABUKA K'UMUCERI

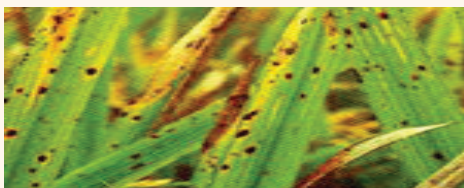
Iyi ndwara iterwa n'agahumyo bita "Helminthosporium oryzae", igafata ingingo zose z'umuceri.

Ibimenyetso

- Ibiyongereye by' ikijuju ku mababi , byoroshye cyane kubyitiranya nibiza kubera uburima ariko aha utudomo tuba ari duto;
- Iboneka cyane ahantu hari ubutaka buba buretsemo amazi kandi hatakoreshwe imvaruganda ihagije;
- Uduhumyo dukwirakwizwa n' umuyaga cyangwa no kuba igihingwa cyafashwe cyakora ku kindi;
- Ubu burwayi bufata igihingwa igihe icyo aricyo cyose.



Imbuto zarwaye kubabuka



Amababi yababutse

Uburyo bwo kuyirinda no kuyirwanya

- Gutera imbuto umuti mbere yo guhumbika (enrobage),
- Gutera imbuto nzima (zitarwaye),
- Kugira isuku mu murima n'ahawegereye,
- Gufumbira neza (gukoresha ifumbire y'imborera n'imvaruganda ku rugero nyarwo),
- Kuyobora neza amazi mu murima,
- Imiti ikoresheya mu kurwanya uburima bw'umuceri ni nayo ikoresheya mu kurwanya indwara yo kubabuka k'umuceri.

C. IKIVEJURU (*Rice Yellow Mottle Virus*)

Ikivejuru n'imwe mu ndwara z'amavirusi izahaza igihingwa cy'umuceri. Iyi ndwara ishobora gutera igabanuka ry'umugaruro riri hagati ya 25-97% iyo itarwanijwe.

Ibimenyetso



Umuceri urwaye ikivejuru

- Umuceri wafashwe n'ikivejuru urangwa n'amababi afite ibara ry'umuhondo werurutse kandi iyo witegereje neza ubonamo uturungo tugorotse dufite akabara k'icyatsi kibisi cyangwa se kabonerana;
- Ubushobozi bwo kubyara buragabanuka ugereranije n'umuceri muzima;
- Umuceri wafashwe n'indwara y'ikivejuru ukiri muto, ntuzana amahundo niyo kandi amahundo aramutse aje arangwamo ibihuhwe byinshi.

Uko indwara y'ikivejuru yandura n'uburyo ikwirakwizwa

Ubushakashatsi bwerekanye ko indwara y'ikivejuru iterwa n'udukoko turuma ku muceli ufite iyo ndwara hanyuma tukaza no kuruma ku muceli utaragerwaho n'ubwandu. Ibyonnyi (imbeba, amafuku) kimwe n'amatungo bishobora gukwirakwiza iyo ndwara mu gihe birimo kugenda birya k'umuceri uri muri pepiniyeli cyangwa mu murima. Mu murima kandi amababi y'umuceri ashobora gukubana bitewe n'umuyaga hakabaho kwanduzanya. Ibikoresho byifashishwa mu buhinzi bw'umuceri (amasuka, nanjoro, imihoro) nabyo bikwirakwiza iyi ndwara.

D. ISAZI Y'UMUCERI

Ni agakoko ko mu bwoko bw'isazi bita *Diopsis Thoracica* gafite ibara ry'umukara ahagana ku mutwe naho ahandi n'ikigina. Iyi sazi ifata amababi ndetse n'intimatima z'umuceri

Ibimenyetso

Isazi itera amagi akavamo inyo ari nazo zangiza cyane. Isazi n'inyo byombi birya amababi, bikanyunyuzamo amazi. Izi nyo zangiza nka nkongwa zizamuka mu ntimatima zihereye mu mizi noneho zikarya umutima w'igikenyeri. Umuceri wafashwe

utarabumbura uhinduka umuhondo. Iyo umuceri ufashe umaze guhagika cyangwa mbere yo kuraba, amahundo ntiyirema neza, nta n'impeke zizamo.



Isazi y'umuceri

Uburyo bwo kuyirinda no kuyirwanya

- Gusukura umurima no kubagara uko bikwiye,
- Kuzamura urugero rw'amazi mu mirima mu gihe hari ibimenyetso
- Gutwika ibikenyeri nyuma yo gusarura,
- Gukoresha imiti yo kurwanya isazi nka Deltamethrine, Cypermethrine, Imidachloprid ku rugero rwa 1ml z'umuti kuri 1L y'amazi.

E. INYONI

Inyoni z'amoko atandukanye zona umuceri zigatera igihombo k'umusaruro gishobora kugera ku rugero rwa 25%-30%. Uburyo bwo kuzirwanya n'ukurinda umuceri mu mirima hakoreshejwe abantu, kadahumeka cyangwa se gushyiramo izindi nyoni ziryza izona umuceri.



Inyoni ku muceri

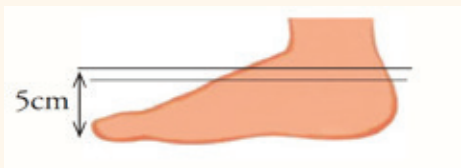
9. GUSARURA

Igihe kiboneye cyo gusarura ni iyo hafi ya 10% ry'intete ziri ku ihundo zikiri icyatsi kibisi nyuma y'iminsi 40-50 umuceri umaze gusambura (bitewe n'ubwoko n'igipimo cy'ubushyuye mu gihe umuceri uri kwera).



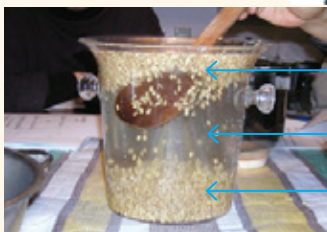
Uburyo bwo kwanika umuceri

Guhura umuceri ukwusarura (kutawurekera mu murima igihe kirekire) hifashishijwe imashini zabugenewe kandi ukirinda kuwangiza. Umuceri wahuwe wanikwa ku mbuga yabugenewe yubakishije beto cyangwa k'umukeka, shitingi. Mu gihe wanitse umuceri ubucucike bw'intete ntibugomba kurenza cm 5 kandi ni ngombwa kuwukorakora byibuze inshuro 2 mu isaha kugirango wume neza wose. Kugirango umenyeko umuceri wumye neza, uwushyira ku ryinyo ukaruma ukumva ko ukocoka.



Uburyo bwo gusukura umuceri

Hari uburyo bunyuranye bwo gusukura umuceri harimo kuwusukura ukoresheje amazi (intete nzima zinjira mu mazi hanyuma ibihuhwe bikareremba hejuru); kuwugosora ukoresheje intoki cyangwa imashini.



Ibihuhwe

Amazi

Intete nzima

Uburyo bwo guhunika umuceri udatonoye

Guhunika bikorwa kugirango hagabanywe ibyangirikira mu bubiko (sitoki). Umuceri wumye neza (ku gipimo cy'ubuhehere 14.0–15.0%), ugomba gushyirwa mu buhunikiro busukuye neza, butavirwa, bufite uburyo bwo kwinjiza umwuka kandi bworoshya igenzura, ihungira, gushyiramo indi myaka cyangwa kuyikuramo. Imifuka ishira k'ubutanda bwabugenewe (palette) kugirango umuceri urindwe guhura n'ubukonje.



Uburyo bwo kurwanya ibyonnyi mu buhunikiro

Mu buhunikiro hakunze kuboneka udusimba/ udukoko twangiza imbuto/umugaruro kandi bigatera igihombo mu bwiza n'ubwinshi bw'umugaruro ndetse no gutakaza ubushobozi bwo kumera. Tumwe muri utwo dukoko twangiza harimo imbeba, imungu n'utundi dukoko two mu bwoko bw'ibinyugunyugu. Kwirinda ibi byonnyi ni ukugirira isuku ubuhunikiro.

IMBEBA

Imbeba zirya impeke izo ari zo zose zaba inzima, izamenaguritse cyangwa izabaye ifu. Zangiza cyane impeke/umugaruro kuko zizandurisha ubwoya bwazo, inkari ndetse n'amahurunguru.



Uburyo bwo kuzirwanya

Mu rwego rwo kwirinda imbeba mu buhunikiro hakoreshwa imitego (rwagakoko) cyangwa se bakazitegesha imiti (ibinini) yo kuzica.

D. IBISHYIMBO



1. Aho ibishyimbo bihingwa

Bihingwa hose mu Rwanda. Ibishyimbo bigufi bikunze guhingwa mu misozi migufi n'iciriritse kugeza ku butumburuke bwa metero 1800. Ibishyimbo bishingirirwa bihingwa mu gihugu hose ariko cyane cyane mu misozi iciritse n'imiremire.

2. Ubutaka

Ibishyimbo bikunda guhingwa mu butaka bufite ifumbire ihagije, buseseka, burebure kandi butuma umwuka ubutemberamo.

3. Amoko yamamazwa :

- Ibishyimbo bishingirirwa : CAB 2, MAC 44, RWV 1129, RWV 3316, RWV 3317, RWV 2887, RWV 3006, Gasilida, RWV 2070, RWV 2872, Mwirasi, Kigondo.....
- Ibishyimbo bigufi : RWR 2245, RWR 2154, RWR 1668, RWK 10. RWR 2091....

4. Gutegura umurima

Imirimo isabwa:

- » Kurwanya isuri,
- » Kurima bwa mbere no kurima bwa kabiri hagakurikiraho gutabira bagiye gutera imbuto.
- » Gahunda yo gusekera ikorwa ibyumweru bibiri mbere y'uko imvura igwa ku nshuro ya mbere no gusanza mu gihe cy'itera.

5. Gufumbira :

- Bashyiramo toni icumi(10T) z'ifumbire y'imborera iboze neza kuri hegitari imwe (1Ha) mu gihe cy'itabira;
- Bakongeramo ifumbire mvaruganda kilo ijana (100 Kg) za DAP mw' itera kuri hegitari (Ha) ;
- Mu butaka busharira bashyiramo toni ebyiri n'igice (2.5T) kugeza kuri toni enye(4T) z'ishwagara byibura ibyumweru bibiri mbere yo gutera. Iyo shwagara iba igomba kumaramo ibihembwe by'ihinga bine(4).

6. Gutera imbuto

Batera kilo mirongo ine (40 kg) kugeza kuri kilo mirongo irindwi (70 kg) z'imbutu kuri hegitari (Ha) bitewe n'uburemere bw'intete. Gutera ni kuri santimetero mirongo ine(Cm 40) cgse mirongo itanu (cm 50) hagati y'imirongo na santimetero makumyabiri (cm20) ku mirongo bashyira intete ebyili (2) mu kobo.

Igihe cy'itera cyiza:

Ni muri Nzeli - Ukwakira mu gihembwe cy'ihinga A no mu ntangiriro za Gashyantare mu gihembwe cyihinga B ubutaka bumaze gusoma. Mu bishanga ni muri Gicurasi – Kamena mu gihembwe cy'ihinga C. Aya mezi ashobora guhinduka iyo ibihe byahindutse.

7. Gufata neza ibishyimbo mu mirima

Mu mirimo y'ingenzi: twavuga kubagara ibishyimbo no gusukira ibishyimbo bifite amababi ane. Gushingirira nyuma y'isukira. Imishingiriro igomba kugira uburebure bwa metero ebyiri (2m) byibuze. Umubare w'imishingiriro ni 50.000 kuri hegitari (500/ ari). Umuhinzi agomba kandi kurwanya indwara n'ibyonnyi hakoreshejwe amoko yihanganira indwara. Bagomba guterera ku gihe imbuto ndetse n'imiti. Kubagara bikorwa inshuro ebyiri nibura ariko igihe cyose ari ngombwa byakorwa.

8. Indwara n'ibyonnyi by'igihingwa cy'ibishyimbo

A. Akaribata/Nyiragakecuru(Anthracnose)

Iyi ndwara iterwa n'agahumyo bita "*Colletotrim lindemuthianuum.*" Indwara ifata imisogwe, amababi, imishogwe n' imbuto.

Ibimenyetso

- Amabara maremare asa n'umutuku ku mababi,
- Amabara y'umukara y'uruziga asa n'ikigina kivanze n'ikijuju ku misogwe.



Imisogwe igaragaza uburwayi ndetse no ku mababi

Uburyo bwo kuyirinda no kuyirwanya

- » Gutera amoko yihanganira indwara,
- » Gutera imbuto itarwaye (yasaruwe ku misogwe itarwaye),
- » Gusimburanya ibihingwa mu mirima.
- » Guhungira imbuto mbere yo kuyitera hakoreshejwe imiti nka Benomyl hakoreshejwe garama ebyiri (2) ku kilo cy'imbuto.

B. KUBEMBA

Iyi ndwara iterwa na virusi yitwa bean common mosaic virus (BCMV), itangirira ku mababi igafata n'imishogwe ndetse n'intete. Itera igihombo k'umusaruro kuburyo bukabije.

Ibimenyetso:

- Amababi ata ireme, akaba mato, akihina mu mpande hareba hasi, ibishyimbo byafashwe ntibikura neza, bisa n'ibucikiranye kandi umusaruro ukaba mucye. Amabara atandukanye aza ku mababi asa nicyatsi kivanze n'umuhondo.



Uburyo bwo kuyirwanya:

- Kurandura ibihingwa birwaye bigatwikwa,
- Guhinduranya ibihingwa simbka igihembwe mbere yo gutera imboga mbere yuko uburwayi buboneka nibihembwe bitatu (3) nyuma yuko uburwayi buza,
- Gutera imbuto zihangania indwara

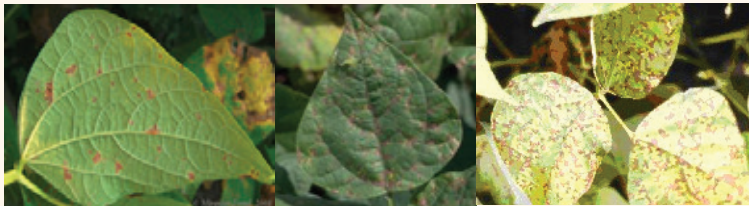
- Gutera imiti nka Cypermethrin (cc imwe y'umuti muri litiro imwe y'amazi: 1cc/1L), lambdacyhalothrin(1cc/1L) ndetse na Jacket(1cc/1L) kugirango urwanye udusimba tuyikwirakwiza.

C. AMABARA AKORA INGUNI (*Angular leaf spot*)

Iyi ndwara ifata amababi, imisogwe ndetse n'intete.

Ibimenyetso

Iyi ndwara irangwa n'amabara y'ikigina afite inguni ku mizi y'amababi. Ishobora no kugaragara ku mishogwe ndetse no ntente.



Indwara ikora amabara mu nguni y'imizi y'ibabi

Uburyo bwo kuyirinda no kuyirwanya

- Gutera imbuto ihungiywe hakoreshejwe imiti nka Benomyl cgse rhidomil no gukoresha amoko y'imbuto y'ibishyimbo yihanganira indwara.
- Mu gihe urimo ubagara ukoresheje isuka irinde gukomeretsa imizi kuko byatuma igihingwa gifatwa n' ubu burwayi
- Kwirinda gutembera mu murima igihe hatose
- Koresha isaso kugirango itaka ridatarukira kubihingwa
- Sukura ibikoresho mbere yo kubikoresha mumirima y' ibishyimbo itandukanye
- Twika ibisigazwa by' ibihingwa birwaye nyuma yo gusarura cgse ubigaburire amatungo
- Cukura utwobo duto mu murima dukamure amazi Sukura ubutaka kugihingwa kugirango imizi y' igihingwa ikure neza
- Tera imbuto mu ubutaka kuburyo utazitaba kure muri sentimetero eshanu.

D. Indwara y'ikiziga (*Ascochyotose*)

Iyi ndwara iterwa n'uduhumyo twitwa ***Ascochyta phaseoli***, ifata amababi, imisogwe ndetse n'intete.

Ibimenyetso:

Amabara y'ikigina yeruruka agiye akora inziga nyinshi zicucitse.



Asikoshitozi ku mababi y'ibishyimbo

Uburyo bwo kuyirinda no kuyirwanya:

- Gutera amoko yihanganira iyo ndwara, guhungira imbuto hakoreshejwe imiti nka Benomyl bakoresheje garama ebyiri (2) za buri bwoko mu kilo kimwe cy'ibishyimbo.

E. Bacteriose (Ububembe)

Iyi ndwara ikunda kugaragara ahantu hakonja cyane ngo mu Majyaruguru, mu Uburasirazuba n'igice cy'amajyepfo cyegeranye n'ishyamba rya Nyungwe (Nyamagabe).

Amabara abengerana ku mababi nk'aho bamennyeho amavuta y'ubuto ku kibabi hejuru.

Uko iyo ndwara yiyongera amababi agenda ashwanyagurika yose kikagabanya umusaruro.



Uburyo bwo kuyirinda no kuyirwanya

Iyi ndwara ntamuti wo kuyirwanya uhari kugoresha imbuto zindobanure ziyihanganira nibyo byonyine biyirwanya.

F. INDWARA Z' IMIZI (Root rots)

Ibimenyetso

Kubora kw'imizi, kuma ibishyimbo bikiri bito cyangwa amababi akaba umuhondo cyangwa se bikuma bigeze mu rurabo. Umusarururo ukagabanuka cyane cyangwa ukaba nta n'icyo wasarura.

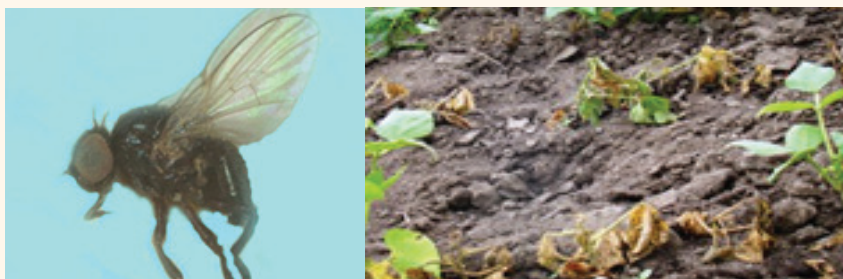


Uko twayirwanya

Guterera igihe, guhinduranya ibihingwa, kwirinda amazi areka mu murima w'ibishyimbo abuza imizi guhumeka neza, gukoresha imbuto zihanganira izo ndwara ariko cyane cyane ibishyimbo bya mushingiriro kuko byihanganira izo ndwara kurusha ibishyimbo bigufi.

G. ISAZI Y'IBISHYIMBO (*Malanagromyza phaseoli*)

Iyi sazi irya ku mbuto zimaze guterwa mu ubutaka (umunigo). Ituma ibishyimbo bikura nabi n'amababi agahinduka umuhondo.



Uburyo bwo kuyirwanya

- Gufumbira uko bikwiye.
- Gusukira hakiri kare, bituma imizi ikura neza ikanakomera.
- Gusimburanya neza imyaka mu murima: ibishyimbo ntibisimburwa n'ibindi binyabisogwe mu murima nka soya, amashaza, inkori, imikunde cyangwa ibindi bishyimbo.
- Gutera umuti nka "imidacloprid" ku rugero rwa mililitiro y'umuti bavanga na litiro imwe y'amaz (1ml /1l)

h. Ubugunguru (*Aphis fabae*)

Utu dukoko dufata igice cyose cyo hejuru cy'igishyimbo. Utu dukoko akenshi dusa n'umukara twibumbira hamwe muni y' amababi y' ibishyimbo cgse k'uruti. Iyo ari twinshi mu gihe cy'uruyange cgse ururabo bishobora kugabanya umusaruro cyane.



Ubugunguru bwirabura ku bishyimbo

Uburyo bwo kuyirinda no kuyirwanya

- Uburyo budahenze busaba gukoresha urusenda, ivu, isabune, amaganga bivanze n' amazi.
- Bubaye budapfuye tera umuti wa Profenofos 40g + Cypermethrin 4g:1ml/1Litiro y'amazi.
- Iyo hagaragaye utu dusimba ku gice gito cy'umurima w'ibishyimbo ni ngombwa gutera ku bihingwa byose.

9. GUSARURA

Igihe cyiza cyo gusarura

- Isarura riba nyuma y'amezi 3, 4 cgse 5 bitewe n'ubwoko bwahinzwe, Akarere ndetse n'ikirere, amababi amaze guhindura ibara akaba umuhondo agatangira guhunguka.
- Akenshi bitewe n'ubwoko, imisogwe ihindura ibara igasa na kaki.
- Iyo ibishyimbo byeze neza biba bifite igipimo cy' ubuherere buri hagati ya 15 na 18%.



Ibyo umuntu agomba kwitwararika mw'isarura:

- Kwirinda gusarura imisogwe y'ibishyimbo yafashe ku butaka kuko ishobora kwandura uburwayi buturutse ku dukoko dutera indwara tuboneka mu butaka
- Kwirinda ko ibishyimbo biguma ku zuba igihe kirekire cyangwa kunyagirwa n'imvura kuko bishobora kwangirika mu gihe cyo kubihura
- Isarurwa rikorwa igihe izuba ritari ryinshi

Uburyo bwo gusarura

Mugusarura ibishyimbo hifashishijwe intoki, ibishyimbo bigufi birarandurwa naho ibyo ku mishingiriro bigatotorwa.

Kwanika ibishyimbo

- Ku mbuga, ibishyimbo byanikanwa n'amababi yabyo, bikanikwa ku mbuga isukuye neza (hakubuye), bikaba byiza habaye hashasheho shitingi cyangwa bakabyanika ahubakiwe na sima.
- Ku mabaraza y'inzu cyangwa k'urusenge: Iyo imbuga idahagije hashobora kwifashishwa urubaraza cg urusenge



Guhura ibishyimbo

Guhura ni igikorwa cyo kuvana imisogwe mu bishishwa. Ahenshi haracyakoreshwa uburyo bwo guhura hifashishijwe ibibando ku mbuga.



Kugosora

- Kugosora ukuramo umukungugu, amabuye, ibitaka n'undi mwanda wose ushobora kugaragaramo.
- Kujonjora imbuto n'ibindi byivanze bitari ibishyimbo



Guhunika

Intete zihunikwa ni izimaze kuma neza zifite igipimo cy'ubuhehere buri munsu ya 15%. Mbere yo kubika cyangwa guhunika, ibishyimbo byongera kwanikwa nibura iminsi ibiri kugira ngo bishiremo ubukonje ndetse hagakoreshwa n'imiti ituma bibikwa igihe kirekire bitamunzwe.

Guhunika ibishyimbo bikorwa mu buryo bwitondewe hitabwa ku bintu by'ingenzi bikurikira:

- Koresha aluminium phosphate: ikinini kimwe gihungira ibiro 100 by'intete z'ibishyimbo cgse Supercana 100gr kubiro 100 z'ibishyimbo.
- Intete zifungwa mu mifuka isukuye
- Iyo mifuka ishira mu buhunikiro busukuye, butarimo ibyonnyi nk'imbeba n'imiswa, hinjiramo umwuka, hatari ubuhehere bwinshi, hatagera amazi cgse imvura.



E. SOYA



1. IRIBURIRO

Soya ni igihingwa cy'ingirakamaro mumirire y'abantu n'amatungo ndetse no kurumbura ubutaka.

2. Aho Soya ihingwa:

Mu Rwanda Soya ihingwa cyane cyane mu misozi migufi (Iburasirazuba), iciriritse (Amajyepfo) n'iburengerazuba mu nkengeri z'ikiyaga cya kivu no mu kibaya cya Bugarama. Soya ikunda ahantu hashyushye kugirango imere kandi ikure neza. Ikenera imvura iringaniye mu gihembwe cy'ihinga.

3. Ubutaka:

Soya ikunda ubutaka bw'isi ndende bufite ifumbire ihagije kandi butuma umwuka ubutemberamo.

4. Amoko yamamazwa mu Rwanda:

Peka 6, SB 24, Sequel, Squire, Safari na Saga.

5. Gutegura umurima

Kurwanya isuri aho biri ngombwa, kurima bwa mbere, gutabira bavanamo urwiri n'ibindi byatsi bibi nk'inteja no gusanza bagiyeye gutera imbuto.

6. Gufumbira :

- Imborera iboze neza bafumbira toni 10 kuri ha cg kg 100 kuri ari . Mugihe wakoresheje rhizobium na DAP ushobora gukoresha toni 5 z'imborera kuri ha cg kg 50 kuri ari.
- Imvaruganda ikoresheya ni Kg 100 za DAP kuri Ha cg kg 1 kuri ari ;
- Mubutaka busharira koresha ishwagara ibyumweru 2 mbere yogutera kukigero cya toni 2.5 cg kg 25 kuri ari.

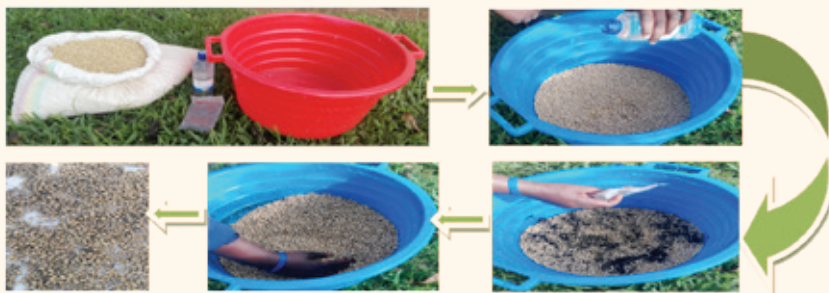
Uko gufumbira bikorwa: Iyo umaze guca imirongo ubanzamo ifumbire y'imborera hanyuma ukanyanyagiza DAP mumurongo, ugatwikirizaho agataka gake kugirango ifumbire itangiza imbuto, ugashyiramo imbuto hanyuma ugatwikiriza itaka nkuko bigaragara kugishushanyo kiri munsu



Rhizobiyumu nuko ikoreshewa: Rhizobium ni ifumbire ikorerwa muri laboratwari hifashishijwe udukoko "bacteria" tuba muduheri two kumizi y'ibinyamisogwe (nodules). Ivangwa n'imbuto mbere yo gutera hakoreshejwe agapfunyika ka garama 80 kakavangwa n'ibiro hagati 8-10 by'imbuto ya Soya bigatuma Soya ibasha gukoresha **azote** iri mumwuka wo mukirere kukigero cya 78%.

Uko ikoreshewa:

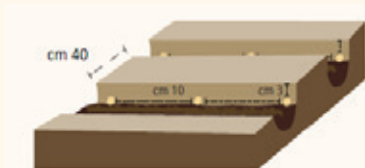
- Minjira utuzi dukeya ku mbuto ugiye gutera,
- Vanga garama 80 za rizobiyumu muri kg 8-10 by'imbuto. Imbuto yavanzwe na Rhizobium ntishyirwa ku zuba kandi iterwa uwo munsu ikarangira.
- Mu gihe cyo gutera shyira buri rubuto kuri cm 5-10 mu gaferege hanyuma uhite utwikirizaho itaka.



Ubushakashatsi bwakorewe mu Rwanda bwerekanyeko Rhizobiyumu yongera umusaruro wa soya kukigero cya 20% kimwe nuwakoresheje ifumbire ya Ire(urea) ingana n'ibiro ijana (100 kg) kuri hegitari imwe.

7. Gutera n'igihe cyo gutera

- Umuhinzi akoresha Kg 60 z'imbutu kuri Ha cyangwa gr 600 kuri ari.
- Batera kuntera ya cm 40 hagati y'imirongo na cm 10 ku murongo bashyira intete imwe mu kobo nkuko bigaragara kugishushanyo kiri munsu



- Mugihembwe cy'ihinga cya **A** soya iterwa kugeza mumpera z'ukwakira naho mugihembwe cy'ihinga cya **B** igaterwa kugeza mumatariki 5 y'ukwezi kwa werurwe bitewe nigihe imvura yabonekeye.

8. Gukurikirana soya mumurima no kuyifata neza

- Genzura ko zameze, aho zitameze uhasimbuze izindi
- Rinda umurima wawe inyoni nyuma yogutera kugeza kubyumweru 2
- Bagara nyuma y'ibyumweru 2 umaze gutera(kumenera) n'ikindi gihe bibaye ngombwa
- Genzura ko nta burwayi cyangwa ibyonnyi biri mu murima

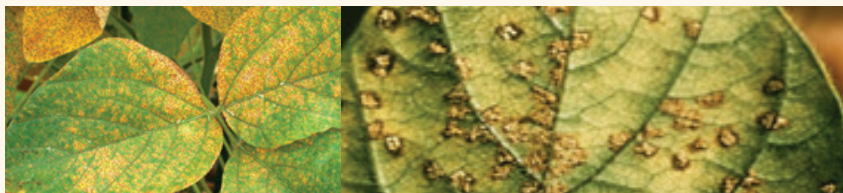
9. INDWARA N' IBYONNYI BY'INGENZI BYANGIZA SOYA

A. UMUGESE

Iyi ndwara iterwa n'agahumyo ko mu bwoko bwa *Phakospora pachyrhizi*. Uburwayi buhera ku mababi yo hasi bikagenda bizamuka hejuru.

Ibimenyetso

- Amababi yafashwe agaragazwa n'ifu y'ikigina gishyira umutuku igaragara ku ruhanda rwo munsu y'amababi.
- Amababi yafashwe agira amabara y'umuhondo ku ruhanda rwo hejuru nyuma agacikagurika.



Soya yafashwe n' umugese

Uburyo bwo kuyirinda no kuyirwanya

- Kubahiriza gahunda yo gusimburanya ibihingwa mu murima;
- Gutera imbuto nziza yujuje ubuziranenge bwemewe;
- Gukoresha imbuto zihanganira iyo ndwara;
- Gutera imbuto ihungije umuti wica udhumyo dutera iyo ndwara nka Carbendazim ku rugero rwa: 800 gr/1 kg cy'imbuto;
- Mu gihe soya yafashwe tera umwe umuti ikurikira: Azoxystrobin(Azoxystrobin: 10gr/20L z'amazi) , Benomyl (Benomyl: 20 gr / 20 L z'amazi); Tebuconazole 20 ml/20L z'amazi cg Copper hydroxide 30 g/20L z'amazi

B. KUBEMBA/MOZAYIKE (*Mosaic Virus*)

Kubemba kwa soya biterwa n'agakoko ko mu bwoko bwa virus.

Ibimenyetso:

Amababi yafashwe arapfunyarara imitwe yayo igasa nk'ishinze, hanyuma igihingwa kiragwingira ntigikure.



Amababi ya soya yabembye

Uburyo bwo kuyirinda no kuyirwanya

- Kubahiriza gahunda yo gusimburanya ibihingwa mu murima (soya ntisimburana n'ibindi binyamisogwe);
- Gutera imbuto nziza yujuje ubuziranenge bwemewe yasaruwe mu murima utaragaragayemo indwara yo kubemba;
- Kurandura mu murima soya yabembye;
- Gutera umuti wica udusimba nk'ubuhunduguru (aphids) kuko aritwo tuyikwirakwiza.

C. INDA/UBUHUNDUGURU

Inda cg ubuhunduguru ni agasimba gatungwa no kunyunyuzwa ibimera gafashe kumababi yabyo.



Zikwirakwiza virusi nyinshi zitera indwara. Ikindi nuko umushongi w'inda ukurura udhumyo tw'umukara dutwikira ikibabi bigatuma kidakora neza ibitungagihingwa.

Uburyo bazirinda no kuzirwanywa

- Terera igihe,
- Ubahiriza igerambuto riteganywa
- Gufumbira no kubahiriza imirimo yose ikorerwa soya kugirango ikure neza
- Tera imiti yica udusimba nka Lambda-Cyhalothrin:1 ml/1L y'amazi cyangwa Azadiractin 0.3% EC: 1ml/1L y'amazi.

D. NYAMWIHINA

Nyamwihina ni agakoko ko mu bwoko bw'ibinyugunyugu kitwa *Lamprosema indicata*.

Ibimenyetso:

Igihingwa cyafashwe kigaragazwa n'amababi azingiyeye hamwe nk'azirikishije utudodo Nyamwihina yihishemo imbere. Nyamwihina yangiza ikibabi ihereye mu nsi kandi itagipfumuye. Igaragara cyane mu gihe cy'izuba.



Uburyo bwo Kuyirinda no Kuyirwanya

- Guhingira igihe;
- Gutera imiti nka:
- Cypermethrin: 20 ml / 20 L amzi
- Lamda-Cyhalothrin: 20 ml/20 L y'amazi
- Azadirachtin: 20 ml/20 L y'amazi
- Acetamidrid: 10ml/ 20L z'amazi.

E. INUMA N' INKOKO



Uburyo bwo Kuzirinda

- Mugihe kitera twikira neza imbuto ku buryo itagaragara/itanama hejuru
- Kurinda umurima kuva soya imaze guterwa kugera byibuze ku byumweru bibiri.
- Gusarura soya yeze neza itaramenekera mu murima.

10. IGIHE SOYA YERERA N'UMUSARURO WAYO

Soya yera hagati y'iminsi 90 kugeza ku minsi 120 bitewe n'ubwoko bwayo. Mu gihe hakoreshejwe inyongeramusaruro zikenewe hashobora kuboneka umusaruro uri hagati ya Kg 1,200 na Kg 3,000 hakurikijwe ubwoko (variety).

11. GUSARURA

- Soya isaruwra igihe amababi yahindutse kaki;
- Bukatira soya ahagana hasi ku ruti kugira ngo umunyu wa Azote uri mu duheri turi ku
- mizi ya Soya ugume mu butaka ;
- Gusarura igihe cy'amafu/hahehereye mugitondo mu kwirinda ko Soya isadagurikira mu murima.



Soya igejeje igihe cy'isarurwa



Gusarura soya

12. KWANIKA

Kwanika soya bikorwa iminsi 3 kugeza ku minsi 5 ahantu hasukuye hatari ku butaka. Yanikwa ku mbuga ya sima, ibirago cyangwa shitingi. Yihindure kenshi bishoboka kugirango zume neza. Soya yanurwa izuba ritaranga kugira ngo zidahura n'ubukonje.

13. GUHURA

Guhura Soya bishobora gukorwa mu buryo bwa gakondo hakoreshejwe ikibando, ariko muri iki gihe byaba byiza hakoreshejwe imashini yabugenewe aho bishoboka.

14. KUGOSORA

Soya igosorwa hakoreshejwe uburyo bwa gakondo hifashishijwe urutaro cyangwa se bishobotse hagakoreshwa imashini yabugenewe. Umwanda wose wivanze na soya ndetse nizamenaguritse bikurwamo mbere yo guhunika.

15. GUHUNIKA

Soya ihunikwa igomba kuba yumye neza ku buryo igipimo cy'amazi mu ntete kitajya hejuru ya 11%. (Iyo udafite ibikoresho bipima ubu buhehere ukoresha iryinyo iyo soya ihise imeneka iba yumye neza), Ihunikwa ahantu hari umwuka, humutse kandi hatagera ibyonnyi. Imifuka igomba gupangwa ku dutanda tw'imbaho (palettes) ntigire aho ihurira n'ubukonje bwo hasi.



Soya ihunikwa igihe gito (*ntirenza ibihembwe2 by'ihinga*) kubera ko yangizwa n'ubushyuhe ndetse n'ubuherehere birengeje urugero. Ni ngombwa rero gutera imbuto isaruwe vuba. Mu gihe utizeye neza ubwiza bw'imbuto ugiye gutera, ningombwa gukora isuzuma mimerere yazo mbere yo kuzitera.

Uko isuzuma mimerere rikorwa: Ufata intete 100 ukazishyira kw'isahane cyangwa ibase irimo igitaka, ukaminjiramo amazi make, ugatwikira bikamara iminsi 7, hanyuma ukabara imbuto zabashije kumera. Niba umubare wizameze uri hejuru ya 80, ubwo imbuto ziba ari nziza. Iryo suzuma rikorwa ibyumweru 2 mbere yo gutera.

16. IBYONNYI BYO MU BUHUNIKIRO

Ibyonnyi bikomeye bya soya mu buhunikiro n'imbeba. Imbeba ziry ari zo zose zaba inzima, izamenaguritse cyangwa izabaye ifu. Zangiza cyane umusaruro kuko ziwandurisha ubwoya bwazo, inkari ndetse n'amahurunguru yazo.



Uburyo bwo kuzirwanya

Mu rwego rwo kwirinda imbeba mu buhunikiro hakoreshwa imitego (rwagakoco) cyangwa se bakazitegesha imiti yabugenewe yo kuzica.

F. URUTOKI



1. AHO URUTOKI RUHINGWA

Urutoki ruhingwa mu turere dufite ubutumburuke buri hagati ya metero 0-1800 uvuye ku nyanja. Uburengeje 1800, ubukonje bwaho butuma rutinda kwera.

2. UBUTAKA

Urutoki rwishimira ubutaka bw'isi ndende, bwumutse, bworoshye, bufite ubusharire buri hagati ya 5- 6.5 kandi bufite ifumbire ihagije.

3. AMOKO YAMAMAZWA

Hari amoko menshi ariko atanga umusaruro ushimishije kandi yishimirwa n'abahinzi ni aya:

- » **Mu biribwa**(Inyamunyo): Injagi, Mporogoma, injogo, Barabeshya, ingaju, Mbwarziruma, Cyerwa.
- » **Mu bitoki by'imineke**: Poyo, Kamaramasenge, Fhia 17, Gros Michel, Ikinyangurube, Igisukari.
- » **Mu bitoki byengwa**: FHIA 25, intuntu, intokatoke, ingoromoka, indenge
- » **Mu bitoke by'imishaba**: Muzuzu, Tsambunu, umushaba1

4. GUTEGURA UMURIMA

Kurwanya isuri no guhinga umurima neza hamarwamo urwiri n'ibindi byatsi bibi no gucukura imyobo izajyamo insina. Iyo myobo igira **cm 60 z'ubujyakuzimu na cm 90 z'umurambararo**. Mu gucukura umwobo itaka ryo hejuru (muri 40cm) rishyirwa ukwaryo n'irisigaye hasi rigashyirwa ukwaryo (20cm zo hasi). Ubutaka buvuye hejuru busubizwa mu mwobo bukavangwa n'ifumbire.

5. GUFUMBIRA

- » Gutera hakoreshwa ifumbire y'imborera iboze neza iri hagati **ya kg 20- kg 30** mu mwobo umwe.
- » Urutoki rukenera N,P,K,Ca, Urea .
- » Nyuma insina zimaze gukura, zifumbirwa ku muzenguruko (muri **cm 60 uvuye ku nsina**) mu gaferege waciye katari karekare kugira ngo imizi y'insina itangirika. Ifumbire y'imborera ishyirwaho byibura kabiri mu mwaka **mu gihe cy'imvura (ku muhindo cyangwa itumba ritangiye) ingana na kg 15- kg 25. Imvaruganda ya NPK (17:17:17)** igenda ishyirwamo gake gake inshuro nyinshi (mu gihe cy'imvura) kugira ngo itazajya yigendera ikajyana n'amazi (ku nsina hajyaho **g 200 za NPK cyangwa g 200 za Ire kuri buri nsina ku mwaka**). Ifumbire mvaruganda yonyine ntishobora gutuma urutoki rwera neza igihe kirekire.
- » ***Gukoresha imborera n'ifumbire mvaruganda nibwo buryo bwiza cyane kurusha ubundi bwo kubungabunga uburumbuke bw'ubutaka buhinzeho urutoki.***

6. GUTERA IMIBYARE

Haterwa imibyare ingana na 1111 kuri Ha, kuko hagati y'imirongo ari metero 3 na metero 3 hagati y'umwobo n'undi (3mx3m).

Batera imibyare ivuye mu rutoki rutarwaye kandi rwera neza, isongoye hejuru, ifite inguri nini; imizi n'ibitaka byavanyweho kandi ifite uburebure buri hagati ya cm 60- cm 120.

Mu mwobo, bashyiramo umubyare umwe. Ni byiza kandi iyo insina zitewe mu mvura y'umuhindo bivuga hagati ya Nzeli n'Uguushyingo kugirango imvura igabanuke zafashe.

7. GUFATA NEZA URUTOKI MU MIRIMA

Imirimo y'ingenzi: gusasira, kubagara, gushangurura/kugabanya amashara, kwicira, gufumbira, gukata imyanana ku gihe, gutega ibitoki inzego, kurimbura inguri zishaje no kurwanya indwara n'ibyonnyi.

8. GUSARURA NO GUHUNIKA

- » **Insina yatewe yana hashize amezi 9-12; hanyuma igasarurwa nyuma y'amezi 3-6 yannye bitewe n'ubwoko bwayo, imiterere y'ikirere n'uburyo urutoki rukorerwa;**
- » Ibitoki by'imineke n'ibyo kwenga ndetse n'imishaba, bigomba gucibwa bimaze gukomera neza kugirango bibashe gushya neza kandi byihuse;
- » Ibitoki by'inyamunyo ntibigomba kubikwa igihe kinini kugirango bidashya (ubishyira ahantu hadashyushye kandi nabwo ntibihatinde);
- » **Ibitoki by'imineke byoherezwa mu mahanga, biba byiza kubyambika amashe bicyana kugeza bisaruwe kugirango ugishishwa cyabyo kitangizwa n'udukoko bigata umwimerere;**
- » **Ibitoki by'imineke bishobora kumishwa, bakabisyamo ifu ikoreshe mu gukora cake, ibisuguti (biscuits), amandazi n'ibindi (RAB igenda ibyigisha amakoperative).**

9. INDWARA Z'INGENZI ZANGIZA URUTOKI

A. Kiribiranya (*Banana Xanthomonas Wilt*)

N'indwara ifata amoko yose y'insina. Iterwa na bagiteri (*Xanthomonas campestris pv musacearum*) igakwirakwizwa n'inzuki zitara ubuki (ziyikura ku nsina zirwaye zikajya ku nsina nzima), imibyare irwaye n'ibikoresho byakoreshejwe mu murima urwayentibisukurwe nabyo bikwirakwiza iyi ndwara.

Ibimenyetso

- Insina yafashwe, amakoma yayo ararabirana, akaba nkayahiye hanyuma akarabirana akuma;
- Umutumba wayo, mu nguri, mu mwanana no mu mabere y'igitoki havamo amashyira y'umuhondo iyo ubikase;
- Igitoki gitangira kuneka kitarakomera; iyo umanyuye ibere usangamo ibara ry'ikigina imbere;
- Umwanana uruma.



Urutoki rurwaye kiribiranya

Uburyo bwo kwirinda kirabiranya mu gihe itaragera mu murima wawe

- Guhora ugenzura umurima wawe igihe uri mu karere kirabiranya yagezemo;
- Guca umwanana ukoresheje isando amabere yanyuma akimara gusohoka mu mwanana;
- Gutera imibyare myiza nk'ivuye muri laboratoire;
- Kwirinda gutizanya ibikoresho bikoreshwa mu rutoki;
- Kwirinda kugendagenda mu murima urimo uburwayi haba abantu ndetse n'amatungo,
- Gutema no gutaba insina zirwaye.

Uburyo bwo kurwanya kirabiranya igihe yageze mu murima

- Kurandura insina n'imizi, n'igitoki cyayo bakabitemagura noneho bakabitaba mu cyobo ku buryo itongera gushibuka;
- Kureka ibyo byatabwe bikabanza bikabura nibura mu gihe cy'amezi atandatu. Muri icyo gihe ntansina cyangwa ibishibuka byazo bigomba kuba aho haranduwe insina;
- Iyi ndwara ishobora kugaragara ku nsina zimwe na zimwe mu rutoki ariko ntigaragare ku zindi. Insina zitagaragaza ibimenyetso ntibivuga ko zitarwaye, kuko bifata amezi atatu kuva insina ifashe n'agakoko (bagiteri) kugirango igaragaze ibimenyetso.

B. Kabore (*Fusarium wilt*)

Kabore n'indwara iboneka mu Rwanda hose. Iterwa n'agahumyo kaba mu butaka bita "*Fusarium oxysporum f.sp. cubens*", kamara imyaka irenga mirongo itanu kakiri mu butaka katarapfa, akaba ariyo mpamvu aho yagaragaye utera amoko yandi atari Kamaramasenge, Kayinja (Gisubi) na Gros Michel kuko ariyo yibasira.

Ibimenyetso

- Amakoma akuze agenda aba umuhondo. Uko hashira iminsi niko amakoma mato nayo afatwa yose akaba umuhondo, akaraba, akuma, agatendera ku mutumba asa n'akoze ijipo, nyuma insina yose ikuma;
- Rimwe na rimwe umutumba w'insina irwaye urisatura cyangwa ukavunika;
- Imbere h'inguri n'umutumba hahindura ibara rijya gusa n'umutuku w'ibihogo kandi hakanuka.



Ibimenyetso bya kabore ku makoma no ku mutumba

Uburyo bwo kuyirwanya

- Gutera imibyare itarwaye,
- Kurandura insina zagaragayeho ubwo burwayi, n'imizi bikumishwa bigatwikwa; cyangwa bikagaburirwa amatungo,
- Birabujijwe gukoresha nk'isaso mu murima insina zagaragayeho uburwayi;
- Kudatera imibyare yavuye mu murima wagaragayemo uburwayi;
- Gutera ubwoko bw'insina bwihanganira kabore, harimo FHIA 17, FHIA 25...

C. Indwara zifata amakoma

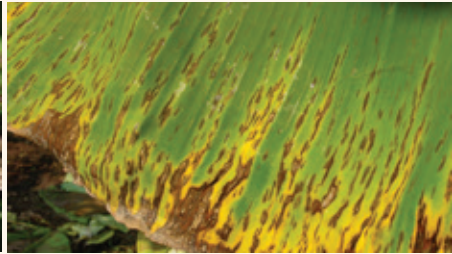
Hari Sigatoka y'umukara (*Cercosporiose*) iterwa n'ikinyabuzima kitwa *Mycosphaerella Fijiensis*, na Sigatoka y'umuhondo iterwa n'ikinyabuzima kitwa *Mycosphaerella musicola* n'indwara y'ibibara ifata amakoma (*Cladosporiose*) iterwa n'ikinyabuzima cyitwa *Periconiella sapientumicola*. Ziterwa n'ibinyabuzima byo mu bwoko bw'imiyeye (uduhumyo), bizana ibibara ku makoma (ugasanga hari ibice byumye mu makoma). Zikunze kuba nyinshi mu gihe cy'imvura kurusha mu gihe cy'izuba.

Ibimenyetso

Sigatoka y'umuhondo isiga uturongo tw'umuhondo ku rukoma, tugeraho tugahinduka ibara ry'ibihogo bijya kuba uruziga. Naho Sigatoka y'umukara izana uturongo tw'ibihogo dukura tugahinduka ikibara kinini cy'umukara, nyuma kikaba ikijuju ahagana hagati.



Sigatoka y'umukara



Sigatoka y'umuhondo

Uburyo bwo kuyirwanya

- Kugirira isuku urutoki rwawe (kurukorera neza, urumuri rukabasha kwinjiramo) ;
- Kwirinda gutera insina ahantu hari ubutaka butose (mu gishanga cg ahandi hari amazi menshi) ;
- Hari n'amoko yihanganira ubu burwayi nka FHIA17 na FHIA25.

D. Tsindika (Banana Bunchy Top Virus)

Iyi ndwara iterwa na virusi. Ikwirakwizwa n'agakoko kitwa *Pentalonia nigronervosa*. Ifata amoko yose y'nsina. Mu Rwanda iboneka i Cyangugu, cyane cyane mu kibaya cya Bugarama ariko imaze no kugaragara no mu bice bya Rusizi na Nyamasheke.

Ibimenyetso

- Umubyare cyangwa insina ifashwe ikiri nto ntikura nkisanzwe izana amakoma menshi cyane insina ikamera nk'indabyo,
- Rimwe narimwe kumuzenguruko w'amababi hagira ibara ry'umweru Insina ifashwe ari nkuru ntigira ishusho y'indabyo,
- Ibimenyetso bigaragara hasi k'umutumba no ku makoma hazaho utudomo tw'icyatsi cyererutse kivanze n'icyatsi kijimye dukoze ishusho y'urukiramende.



Uburyo bwo kuyirwanya

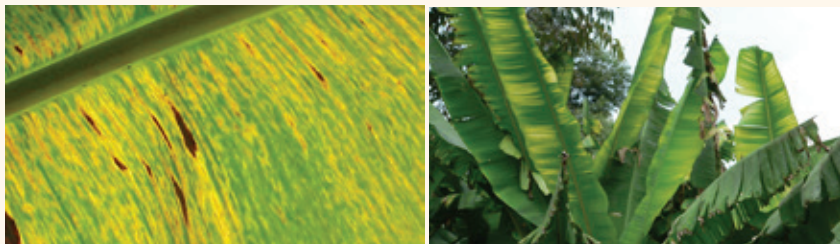
- » Gutera insina zitarwaye;
- » Kurandura insina zirwaye zidatinze n'izigeranye n'izirwaye;
- » Kwirinda gutera insina zivuye mu karere iyo ndwara yiganjemo.

E. Imfunyarazi y'insina (Banana Streak Virus (BSV))

Virus ikwirakwizwa n'agahunduguru kirabura cyangwa k'icyatsi kibisi kitwa *Aphis gossypii* (insecte).

Ibimenyetso byayo

- Uturongo tw'umuhondo ku makoma, hanyuma tugahinduka ibihogo byirabura kandi urukoma rugahinyagara;
- Rimwe na rimwe umwumba urukuma;
- Rimwe na rimwe, insina ibora imbere mu mutumba;
- Insina iyo zanyye igitoki gikomeza kureba hejuru kikarinda gikomera kitareba hasi (kuko umwanana udakomeza gukura);
- Agatoki kaba gato.



Kuyirinda no kuyirwanya

- Kwirinda gutera imibyare utizeye ubuzima bwayo;
- Igihe yageze mu murima kurandura insina zarwaye ukazitaba;
- Gukorera isuku mu rutoki bituma udukoko tuyikwirakwiza tutabona aho tuba;
- Gufumbira, gusasira no gufata neza urutoki bituma rugira imbaraga zo guhangana n'ibimenyetso byayo.

Kurandura insina zafashwe. Bisaba guhora ugenzura insina zafashwe zose ukazirandura. Kugirango ibyo bigerweho, ni ngombwa kugira ubushobozi bwo gutahura ibimenyetso by'indwara itaraba ikigugu.

F. *Indwara ituma inguri ibora*

Iyi ndwara ikunze kugaragara mu rutoki bateye mu murima batemyemo ishyamba. Iterwa n'ubwoko bw'imiyeye bwitwa *Armillaria* sp. Buba ku bwoko bw'ibiti bimwe na bimwe. Iyo miyege ikomeza kwibera mu mizi y'ibishyitsi by'ibiti byatemwe, hanyuma ikigabiza insina zitewe muri uwo murima inyuze mu nguri no mu mizi.

Ibimenyetso

- Urebeye inyuma, ibimenyetso by'iyi ndwara bisa n'ibya kirabiranya (amakoma y'insina aba umuhondo ubundi akuma);
- Iyo ugenzuye inguri, ubona imirongo y'umweru y'imiyeye;
- Rimwe na rimwe ku nguri y'insina hazaho imiyeye imeze nk'ibihumyo;

Kuyirinda no kuyirwanya

- Kwirinda gutera insina ahantu hakiva ishyamba;
- Igihe insina zafashwe barandura insina zirwaye bakazitwika, hanyuma bagatera insina nzima kuri metero nke uvuye aho iyari irwaye yariteye.

G. *Akaribata (Anthracnose)*

Iyi ndwara iterwa n'ubwoko bw'imiyeye yitwa *Colletotrichum musae* kandi yibasira igitoki. Ikunze gufata ibitoki by'innyamunyo.

Ibimenyetso

- Utudomo twirabura dufata ku ndabyo no ku gishishwa no ku mitwe y'amabere y'igitoki. Utwo tudomo dukomeza gukura, amaherezo tukimbika kandi tugaterana tugakora ikibara kinini ku gitoki (ibere);
- Uretse isura yangirika, iyo ndwara nta kindi itwara igitoki ubwacyo.



Kuyirinda no kuyirwanya

- Kugirira isuku urutoki rwawe (rukoreye neza kandi urumuri rwinjiramo), bituma iyo miyege itabona aho yihisha;

Igihe yageze mu rutoki n'ukongera isuku no gufunika igitoki n'isashe zabugenewe kicyana kugeza gisaruwe.

H. Igikongoro (*Cigar end rot*)

Iterwa n'agahumyo bita "*Stachyidium theobromae*". Ikunze kuba ahantu hakonje, igakwirakwizwa n'udukoko tujya gutara ubuki mu ndabyo z'ibitoki.

Ibimenyetso

- Imitwe y'amabere isa nk'itabi ry'isegereti batwitse ariko ritaragusha umuyonga.



Uburyo bwo kuyirwanya

- Kuzirika umwanana n'akagozi mu gihe insina yana kugirango ingobyi (ibikobokobo) zitwikira indabyo ntizifunguke (bituma indabyo zitinjirwa na twadukoko tuza gutara ubuki mu ndabo).

10. IBYONNYI BYANGIZA INSINA

A. Ibivumvuri (*Banana weevils*)

Ikivumvuri gikuru gitera amagi hafi y'inguri y'insina cyangwa mu bisigazwa by'insina ahari ubuhehere. Iyo ayo magi amaze guturaga, ibishorobwa bivuyemo bicukura imyobo mu nguri no mu mutumba ariko bigenda byangiza. Ibyo bishorobwa birakura bikavamo ibivumvuri. Bifata iminsi hagati ya 30 na 40 kugirango igi riturage rizagere ubwo rivamo ikivumvuri gikuru. Ikivumvuri gikuru cy'ikigore gitera amagi 96 ku munsu kandi gishobora kumara imyaka iri hagati 3-4. Bityo rero, ibivumvuri bitarwanyijwe bishobora kwangiza urutoki cyane.

Ibimenyetso:

- Bibangamira insina ntizamure neza amazi n'ibiyitunga;
- Insina ikura nabi kandi ikananuka;
- Insina itinda kwana;
- Umusaruro uragabanuka;
- Rimwe na rimwe insina irangirika burundu;
- Mu nsina zazonzwe cyane n'ibivumvuri, umutumba uvunikira aho ufatanira n'inguri.

Uko barwanya ibivumvuri byangiza insina:

- Gutera imibyare mizima itarangijwe n'ibivumvuri (iyo uhase inguri ugasanga yarariwe urayijugunya, ifite imyobo muinshi);
- Inguri imaze guhatwa itera mugihe kitarenze iminsi itanu;
- kugirira isuku urutoki (gushangurura, gutemagura imitumba y'insina zisaruwe no kuyisanza, gucoca inguri kugirango zume);
- Gutega ibivumvuri ukoresheje imitumba y'insina zasaruwe. Imitego yatezwe itegurwa nyuma y'amasaha 24, ukavana mu ibivumvuri biri mu mitego ukajya kubitwika. Umutego uwusubizaho kandi ushobora gukoreshwa inshuro eshatu gusa. Nyuma y'iminsi itatu, uhindura umutego (umutumba mushya).

B. Amashanya (Nematodes)

Amashanya n'ubwoko bw'ibyonnyi bitagaragarira amaso, biba mu butaka, mu mizi n'inguri z'insina. Arya imizi agatuma yangirika. Ubwoko bw'amashanya bwangiza cyane (bwitwa *Rhodopholus similis*) bukunze kuboneka mu kibaya cya Rusizi (mu Bugarama).

Akenshi ibimenyetso by'amashanya byitiranywa n'ibimenyetso byo kubura ifumbire n'amazi. Ibyo bimenyetso ni ibi:

- Imizi irangirika ntishobore kuzamura amazi n'ibitunga insina;
- Insina ikura nabi igahinyagara;
- Insina itinda kwana;
- Igira igitoki gito;
- Insina zirandukana n'imizi n'uyo hatari ibibazo by'umuyaga

Uko warwanya amashanya

- Ugutera imibyare mizima kandi igaterwa mu murima muzima (utaragaragaye mo ibyonnyi);
- Guhata umubyare ugiye gutera ugakuraho imizi, ukawinika mu mazi ashushye yabize amasegonda 30;
- Urutoki rwafashwe rugomba kurimburwa, umurima ugahingwamo indi myaka (imyumbati, ibijumba n'ibindi urandura insina zishibuka) mu gihe cy'imyaka ibiri, nyuma ushobora kongera guterwamo urutoki.

C. Udukoko twitwa "Thrips"

Mu myaka icumi ishize habonetse udukoko twitwa "*Chaetanaphothrips signipennis*" cyangwa Thrips, twinjira mu mabere y'igitoki duciye mu ndabyo igihe kirimo kwana. Utu twangiza igishishwa (uruhu) rw'amabere y'igitoki rukagira amabara y'ibihogo byegera umukara.

Uburyo bwo Kuzirwanya

- » Gukorera urutoki rwawe neza (kwicira, gushangurura, gukonyorera n'ibindi byose bituma urutoki rugira isuku kandi ruginjiramo urumuri;
- » Kwihutira gukuramo igitoki cyafashwe vuba kandi ukirinda gusubiza mu murima shishwa byacyo;
- » Bikabije ushobora gutera umuri "Nimbecidine (0.5%)" ku makoma yinsina cyangwa ukayitera ukoresheje urushinge mu mwano (amabere y'insina atarasohoka).

K. IBIRAYI



1. Aho bikunda :

Ibirayi bikunda cyane mu turere tw'amakoro no mu misozi miremire ifite ubutumburuke buri hagati ya 1800m na 2400m; Imvura ingana na 1500mm ku mwaka; Ubushyuhe buri hagati ya 17°C na 25°C. Ibirayi bikunda guhingwa cyane mu turere tw' amakoro y'ibirunga (Burera, Musanze, Nyabihu na Rubavu), isunzu rya Congo Nile (Rutsiro, Karongi, Nyamagabe na Nyaruguru) n'imisozi miremire y'ububeruka (Burera na Gicumbi).

2. Ubutaka :

bihingwa mu butaka bwiza, bufite isi ndende, buseseka, bufite ubusharire buke (pH 6-6.5), kandi butuma umwuka ubutemberamo. Ibirayi bikenera ubutaka bw' isi ndende kandi buhitisha amazi ku buryo bworoshye.

3. Amoko y'ibirayi yamamazwa

| Izina ry'imbuta | Iminsi yo kwera | Umurumbuko | Umusinziro | Ubwihangane kuri Kirabiranya | Ubwihangane kuri Ku ndwara y'imvura |
|-------------------|-----------------|------------|------------|------------------------------|-------------------------------------|
| 1. Kinigi | 120-135 | 20-25 | 120 | Irihangana | Irihangana |
| 2. Kirundo | 100-110 | 20-25 | 30-50 | Ntuyihangana | Irihangana |
| 3. Mabondo | 100-110 | 20-25 | 50-60 | Irihangana | Irihangana |

| | | | | | |
|---------------|---------|-------|-------|------------------|------------------|
| 4. Cruza | 120-130 | 20-25 | 20-30 | Irihangana cyane | Irihangana cyane |
| 5. Gikungu | 100-120 | 20-25 | 70 | Ntiyihangana | Irihangana |
| 6. Kigega | 100-120 | 35-40 | 70 | Irihangana | Irihangana |
| 7. Nkunganire | 90-120 | 30-32 | 90 | Irihangana | Irihangana |
| 8. Kazenzeza | 90-120 | 40-45 | 90 | Irihangana | Irihangana |
| 9. Ndeze | 75-90 | 20-22 | 75 | Irihangana | Irihangana |
| 10. Twihaze | 100-120 | 40-45 | 90 | Ntiyihangana | Irihangana cyane |
| 11. Izihirwe | 90-120 | 35-40 | 90 | Irihangana | Irihangana |
| 12. Cyerekezo | 90-110 | 30-35 | 90 | Irihangana | Irihangana |
| 13. Jyambere | 100-120 | 25-30 | 100 | Irihangana | Irihangana |
| 14. Twigire | 90-110 | 30-35 | 90 | Irihangana | Irihangana |
| 15. Gisubizo | 100-120 | 30-35 | 60 | Irihangana | Irihangana |
| 16. Seka | 100-110 | 30-35 | 90 | Irihangana | Irihangana |
| 17. Ndamira | 90-100 | 35-40 | 45 | Irihangana | Irihangana |

4. Uko bategura umurima

4.1. Guhinga bwambere (Gutamura) no Kurwanya isuri: N'uguhinga barima amasinde batera ibyatsi bibi hejuru kugirango byume bizatange ifumbire. Bikorwa mu gihe cy'izuba kuko bituma ubutaka bwota izuba bityo indwara n'ibyonnyi bikagabanuka mu butaka.

Kurwanya isuri bikorwa basibura imirwanyasuri ahari amaterasi yikora kugirango amazi y'imvura azafatwe adatwaye ubutaka. Ku materasi y'indinganire batema ibihuru n'ibyatsi kugirango bitazihishamo indwara n'ibyonnyi.

4.2. Guhinga bwa kabiri (Gutabira): Bikorwa boroshya ubutaka, ibisinde bikamenwa ubutaka bugasigara buseseka ku buryo amazi, umwuka n'imizi y'igihingwa bizanyuramo ku buryo bworoshye.

5. Gufumbira

a) Bashyiramo ibiro **300 kuri are imwe (=metero kare10) by'ifumbire y'imborera iboze neza (iseseka) mu gihe cy'itabira. Iyo fumbire igira akamaro** kurushaho iyo ishyizwe mu tugende cyangwa mu myobo bagiye guteramo ibirayi. Mu gihe cyo gutera bongeramo ikiro n'igice (kg 1.5) k'ifumbire mvaruganda ya NPK 17.17.17 kuri are imwe ishyirwa mu myobo cyangwa mu tugende.

b) Mu butaka busharira babanza gushyiramo hagati ya y'ibiro 25 na 30 by'ishwagara idatwitswe kuri are imwe mu gihe cyo gutabira, ikamaramo ibihe by'ihinga bine.

6. Gutegura imbuto y'ibirayi

- Igomba kuba iri mu bwoko buberanye n'akarere izahingwamo.
- Igomba kuba imeze ifite imimeru irenga 2, ifite umubyimba ungana byibuze nk'igi ry'inkoko.
- Igomba kuba itavanze n'ubundi bwoko, irobanuye neza nta nenge zigaragara inyuma cyangwa imbere
- Igomba kuba ifite inkomoko izwi: yaturutse ku mutubuzi w'imbuto wabigize umwuga cyangwa umuhinzi wayikurikiranye neza mu murima.

7. Igerambuto no gutera ibirayi

- **Igihe cyiza cyo gutera:** Ni mu kwezi kwa Nzeri (mu gihe cy'ihinga A), muri Werurwe (mu gihe cy'ihinga B) no muri Nyakanga (mu gihe cy'ihinga C mu bishanga n'imibande);
- kuri are imwe 1 hakoreshwa imbuto iri hagati y'ibiro 20 na 25
- Batera kuri cm 80 hagati y'imirongo na cm 30 hagati y'ikirayi n'ikindi ku murongo.
- Baca utugende cyangwa bagacukura imyobo bifite cm 20 z'ubujyakuzimu.
- Bashyira ifumbire mborera iboze neza mu tugende cyangwa mu myobo
- Bongeraho ifumbire mvaruganda ya NPK (17-17-17) mu mwobo cyangwa mu tugende
- Batera ikirayi 1 mu mwobo cyangwa mu tugende ariko bashyiramo intera ya cm 30 hagati y'ikirayi n'ikindi, muri cm 8-10 z'ubujyakuzimu, amaso y'ikirayi areba hejuru.



Ifoto: Gutera ibirayi mu tugende



Ifoto: Gutera ibirayi mu myobo

8. Kubagara

Kubagara bwa mbere no kumenera: Bikorwa nyuma y'iminsi 15 kugeza kuri 21 ibirayi bimaze kumera bifite uburebure buri hagati ya cm10 na cm 20.



Ifoto: Kubagara bwa mbere no kumenera

Kubagara bwa kabiri, gusukira itaka no kwongeramo imvaruganda: Bikorwa ibirayi bifite uburebure buri hagati ya cm 20 na cm 30. Bikorwa itaka ryegerezwa ku gice cyo hasi cy'ibirayi, bigatuma bizana indi mizi bigakomera kandi bikabona n'umwanya uhagije wo gushoreramo. Wongeramo imvaruganda (NPK 17-17-17) ingana na 1.5kg kuri are imwe.



Ifoto: Kubagara bwa kabiri no gusukira itaka

9. Kurwanya indwara n'ibyonnyi by'ingenzi

A. INDWARA Y'IMVURA / Mildiou

Ni indwara iterwa n'agahumyo bita "*Phytophthora infestans*". Ifata amababi, imigozi n'ibirayi biri mubutaka. Iyo ndwara iterwa n'imvura nyinshi. Igihingwa cyafashwe kizana urubobi ku mababi no ku migozi; nyuma akaba umukara. Iyo bikabije ugira ngo umurima wababutse.



Ifoto: Indwara y'imvura ku birayi

Uburyo bwo kuyirinda no kuyirwanya:

1. Gutera ubwoko bw'imbuto y'ibirayi bwihanganira iyo ndwara
2. Gutera imbuto nziza ifite icyemezo cy'ubwiza;
3. Guhinga ibirayi mu murima umaze nibura ibihembwe bibili by'ihinga udahinzemo ibirayi;
4. Kurandura ibirayi byimejeje kuko bishobora kubika iyo ndwara bikayikwirakwiza mumurima;
5. Gutera umuti wa Ridomili (Ridomil) ku mababi hose (gr 50 muri litiro 20 z'amazi) inshuro ebyiri (mu ntera y'iminsi 7) ibirayi bikimara kumera. Nyuma y'ibyumweru bibiri batera umuti wa Ditane ku mababi hose (gr 50 muri litiro 20 z'amazi) bagatera inshuro 1 buri cyumweru mu gihe cy'imvura kugeza ibirayi byeze.
6. Gusukira itaka neza ku birayi bituma ibirayi biri mu butaka bitandura.

B. KIRABIRANYA/Bacteriose

Iterwa na Bagiteri bita « *Ralstonia solanacearum* ». Ishobora guterwa no guhinga ibirayi mu murima urimo bagiteri zitera iyo ndwara cyangwa se izo bagiteri zibitse mu mbuto y'ibirayi yatewe.

IBIMENYETSO

1. Kurabirana kw'imigozi y'ibirayi, amababi agahinduka icyatsi kibisi cyeruruka nyuma akuma
2. Iyo uranduye umugozi ubona mu maso y'ikirayi cyezeho haturukamo amatembabuzi y'umweru anuka ameze nk'amashyira; iyo ugitemye usanga imbere hari uruziga rw'umuhondo ushyira ibihogo.



Ifoto: Indwara ya kirabiranya mu nda y'ikirayi



Ifoto: Indwara ya kirabiranya ku migozi

Uburyo bwo kuyirinda no kuyirwanya:

- Gutera ubwoko bw'imbutu y'ibirayi bwihanganira iyo ndwara
- Gutera imbuto nziza ifite icyemezo cy'ubwiza;
- Gutera imbuto nziza y'ibirayi byasaruwe mu murima utaragaragayemo iyo ndwara;
- Guhinga ibirayi mu murima umaze nibura ibihembwe bibili by'ihinga udahinzemo ibirayi;
- Kurandurana ibirayi byafwashwe n'ubutaka bwabyo bigatabwa mu cyobo kure y'umurima;
- Kurandura ibirayi byimeza mumurima igihe cyose bibonetse
- Gutoranya ibirayi bigaragaza ibimenyetso by'uburwayi mu bindi mbere yo guhunika.



Ifoto: Kurandura ibirayi birwaye Kirabiranya

C. **IMFUNYARAZI**

Ni indwara iterwa na Virusi.

IBIMENYETSO

- Amababi areruruka nyuma agapfunyarara, imitwe y'amababi ikamera nk'amahembe;
- Imigozi ntikura neza, iba migufi, ishora nabi kandi igashora uturayi duto kandi duke.



Ifoto: Imfunyarazi ku birayi

Uburyo bwo kuyirinda no kuyirwanya:

- Gutera ubwoko bw'imbutu y'ibirayi bwihanganira iyo ndwara
- Gutera imbuto nziza ifite icyemezo cy'ubwiza;
- Gutera imbuto nzima zasaruwe mu murima utaragaragayemo iyo ndwara;
- Kurandura ibirayi birwaye ndetse n'ibyimejeje kuko bishobora kubika iyo ndwara;
- Gutera umuti wica udhunduguru/inda z'ibirayi (aphids) dukwirakwiza iyo virusi, batera imiti nka Rocket 44 EC (Profenofos 40% + cypermethrin 4% EC) mililitiro 1 ivangwa muri litiro 1 y'amazi.

D. **URUNYO RW'IBIRAYI**

Urunyo rw'ibirayi ruva mu magi aterwa n'agakoko ko mu bwoko bw'isazi yitwa **Liriomyza sp.** Iyo sazi ica utwenge mu mababi igateramo amagi. Ayo magi asohokamo inyo zikurira mu mababi zikanayarya.

IBIMENYETSO

Urunyo rw'ibirayi ruba mu mababi imbere, rukarya amababi rucamo inzira uko rugenda rwimuka. Izo nzira zigaragara inyuma ku mababi mu ibara ryenda gusa n'ikijuju.



Inzira zakozwe n'urunyo ku mababi

Uburyo bwo kurwirinda no kururwanya:

- Guhingira igihe cyagenwe cyo gutera ibirayi
- Kurima no gutabira byibuze icyumweru mbere yo gutera ibirayi mu murima kugira ngo udusimba twicwe n'imirasire y'izuba ;
- Gutera umuti wica urunyo nka Imidachloprid (mililitiro 30 muri litiro 20 z'amazi) cyangwa Abamectin (garama 18 muri litiro 1 y'amazi).

E. INANDA (Cutworm): *Urunyo rusa n' umukara cyangwa ikigina*



Ibimenyetso

- Inanda ikata igihingwa ahagana hasi ku ruti cyangwa ikagikatira mu butaka
- Iyo inanda zikomeje kubaho, zitangira kurya n'ibirayi.

Uburyo bwo kuyirwanya

- Gukata ibyatsi ku nkengeru z'umurima aho zishobora kwihisha mbere yo gutera;
- Kubagara uko bikwiye no kugenzura umurima kare mugitondo ugatoragura inanda ukazica.

F. Indwara y'ubuhari bufite ifu (*Galle poudreuse*)

Ikiyitera: Agahumyo kitwa *Spongospora subterranea*

Ibimenyetso:

Ubuheri buza ku kirayi kiri mubutaka nyuma uruhu rugasaduka hakavamo ifu. Iyo ubwo buheri ari bwinshi, ibirayi ntibikura neza. Iyo ndwara ikwirakwizwa cyane n'imbuto zirwaye. Ikunda kugaragara mu butaka bukonje kandi butose.

Kuyirwanya:

- Gukoresha imbuto zitarwaye;
- Gusimburanya ibirayi n'ibindi bihingwa mu murima



Ifoto: Indwara y'ubuheri bufite ifu

G. Indwara y'ububore bwumye (Pourriture sèche)**Ikiyitera:**

- Uduhumyo bita *Fusarium* spp n'utundi *Phoma exigua* Var. *exigua*. Utwo duhumyo dutera ububore bwumye butanuka bw'ibirayi mu gihe bihunitse.
- Iyo ari *Fusarium*, imbere mu kirayi, ububore butanga ifu y'umweru
- *Phoma exigua* ifata igice kimwe cy'ikirayi mu gihe *Fusarium* yo itera ububore bw'ikirayi cyose, inyuma hariho ifu y'umweru.

Ibimenyetso:

Ku kirayi hazaho ububore bwijimye buhera inyuma bwinjira mu kirayi. Ikirayi gikomeza kubora buhoro buhoro, uruhu rugapfuyarara.



Ifoto: Indwara y'ububore bwumye

Kuyirwanya:

- Gusukura ikigega
- Gusarura no gufata neza ibirayi mu buhunikiro
- Gusarura neza udakomeretsa ibirayi no gufata neza ibirayi mu buhunikiro

10. KUNYOMORA

Mbere yo gusarura, ibirayi biranyomorwa

Kunyomora bituma uruhu rw'ibirayi rukomera rukabirinda kwangirika mu kubihunika kandi bituma indwara ziri mu mababi no mu migozi zidakomeza kororoka mu birayi biri mubutaka.

Kandagiza ibirenge byombi aho ikirayi gitereye kubutaka ufate imigozi y' ikirayi n' amaboko yombi, ushikuze / urandure witonze wirinda gukomeretsa inkondo y' ikirayi mu butaka, nk'uko ifoto iri hepfo ibigaragaza.

Kunyomora hakoreshejwe umupanga nabyo birakorwa ugatema imigozi y'ibirayi byibuze kuri 10cm uturutse ku butaka.

Kunyomora bikorwa nibura mbere y'ibyumweru 2 kugirango usarure.



Ifoto: Ibirayi byeze neza bigeze igihe cyo kunyomorwa

11. GUSARURA/GUKURA IBIRAYI

- Kura ibirayi mu murima utabikomeretsa kandi ubimaremo;
- Ibirayi bikomeretse cyane bigomba gutoranywa bikaribwa vuba;
- Ibirayi bikurwa mu gihe ubutaka bwumutse kandi hari umucyo (nta mvura);



Icyitonderwa

- Ibirayi bigisarurwa bigahura n'ikibazo cyo kunyagirwa ubisanza ahantu humutse neza kandi hatanyagirwa kugirango byumuke neza.
- Irinde kwanika kuzuba ibirayi byagenewe kuribwa kuko bituma bihinduka icyatsi bigasharira.

12. GUTORANYA

Ibirayi bifite ubusembwa/byakomeretse cyangwa ibigaragaza ibimenyetso by'indwara bigomba kuvanwa mu bindi.

Ibirayi byahinduye ibara (icyatsi), ibyakomeretse cyangwa se byangiritse, ibirayi bito bito bikabije bigomba kuvanwa mu bindi ako kanya ntibihunikwe nk'imbuto.



13. GUPFUNYIKA

- Ibirayi bipfunyikwa mu bikoresho byabugenewe bituma ibirayi bihumeka neza: Amagunira, imifuka idoze mu mishipiri, cyangwa mu bitete kugirango bitangirika.
- Imifuka dusanzwe tumenyereye mu gupfunyika amafu, ibigori, amasukari, ifumbire mvaruganda ntikoreshwa mugupfunyika ibirayi kuko ituma bibora.

14. GUHUNIKA

Umuhinzi ashobora kwihunikira ibirayi by'imbuto iyo yakurikiranye neza umurima we akawurinda indwara zavuzwe haruguru. Mu guhunika ibirayi hifashishwa uburyo bwinshi nko kubihunika mu birundo ahantu hasakaye, mu nzu y'imbaho, mu mifuka yabugenewe no mu bitete.

Ikigega cyiza cyo guhunika imbuto kigomba:

- Kuba gisakaye neza (kitava) ;
- Kuba kinjiramo kandi gisohora umwuka n'umuyaga, ubushyuye n'imyuka mibi iva mu birayi ;

- Kuba kinjirwamo umucyo kugira ngo imimero itaba imyeru ahubwo ibe icyatsi, migufi, ibyibushye kandi minini. Ibyo bituma idahunguka mu gihe cyitera kandi ikamera vuba ;



Ubuhunikiro bw'ibirayi by'imbutu mu kigega giciriritse



Ubuhunikiro bw'ibirayi by'imbutu mu bisanduka by'imbaho

Icyitonderwa :

Ibirayi byo kurya iyo bidatwawe ku isoko ako kanya bigisarurwa, bihunikwa mu buhunikiro butagerwamo n'urumuri kubera ko iyo bihuye n'urumuri uruhu rwabyo ruhinduka icyatsi bikiremamo ibinyabutabire bituma bisharira iyo bitetswe.

6. UBUHINZI BW'IMBOGA

A. PUWAVURO

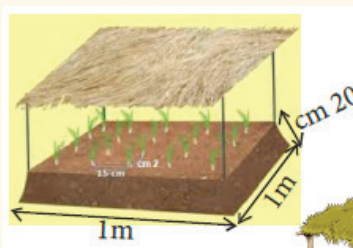


1. Inyongeramusaruro zikenewe kuri ari imwe n'ingano yazo

| Ingano y'umurama | Imborera | NPK 17.17.17 | KCl | Ire | Ingemwe |
|------------------|----------|--------------|-----|-----|---------|
| Garama 3 | 250 | 4.7 | 0.5 | 1.3 | 270 |

2. Gutegura ingemwe mu buhumbikiro

- ✓ Ubuhumbikiro bushyirwa ahantu hatigeze hahingwa ibihingwa byo mu muryango umwe na puwavuro (ibirayi, inyanya, intoryi, urusenda n'ibindi) nibura mu bihembwe by'ihinga bibiri bishize.
- ✓ Ubuso bw'ubuhumbikiro bugomba kuba 1 % by'umurima wose uzaterwamo. Mbese metero kare imwe ku murima wa Ari imwe.



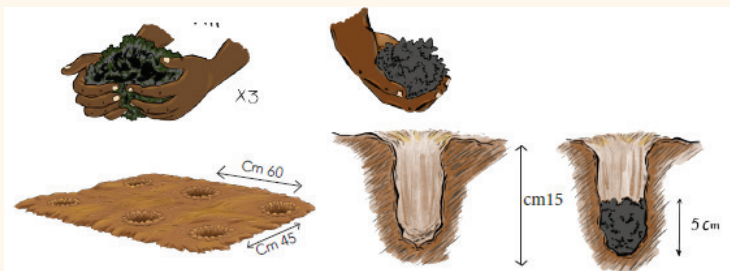
- ✓ Hategurwa ubuhumbikiro bufite ubugali bwa metero imwe kugeza kuri m 1.2 n'ubujyejuru bwa cm 20 kugirango amazi abashe gusohoka mu butaka.
- ✓ Vanga amashyi atatu y'imborera iboze neza (ibiro 3-5) n'ubutaka bwo hejuru : amashyi atatu yuzuye (kg 3-5) kuri metero kare imwe, na garama 20 za NPK 17-17-17 (udufuniko 2 tw'icupa ry'amazi) icyumweru kimwe mbere yo guhumbika.
- ✓ Igihe cyo kwinaza, ringaniza ubutaka, uce imirongo yo kwinazamo ifite ubujyakuzimu bwa cm 0.5 kandi itandukanijwe na cm 10 - 15.
- ✓ Umurama ushyirwa muri ya mirongo yaciwe ku ntera ya cm 2 hagati y'imbutu; hanyuma hakarenzwaho agataka gacye bagatsindagira gahoro.

3. Imirimo ikorwa mu kwita ku buhumbikiro

- ✓ Gusasira hakoreshejwe ibyatsi byumye neza. Nyuma y'iminsi 7-10, ingemwe ziba zimaze kumera maze isaso igakurwaho.
- ✓ Vomerera mu gitondo kare na nimugoroba.
- ✓ Ubaka igisharagati ariko usige aho imirasire y'izuba inyura haboneke urumuri ruringaniye.
- ✓ Bagara buri gihe ndetse wicire ingemwe mugihe zicucitse.
- ✓ Tera umuti urwanya indwara mu gihe ari ngombwa.
- ✓ Gabanya kuvomerera mu byumweru bibiri mbere yo kugemura.
- ✓ Ingemwe zigemurwa zimaze iminsi 45-60 mu buhumbikiro (amababi 4-5).

4. Gutera ingemwe

- ✓ Umurima uhingwa neza ku bujakuzimu bwa cm 30.
- ✓ Vomerera ingemwe mbere yo kuzitera uzitere mu gitondo kare
- ✓ Puwavuro ziterwa ku ntera ya cm 60 hagati y'imirongo na cm 45 mu murongo.
- ✓ Cukura imyobo y'ubujyakuzimu bwa cm 15.
- ✓ Mu mwobo umwe hajyamo ifumbire y'imborera yuzuye amashyi n' agafuniko k' icupa ry' amazi kuzuye NPK 17- 17-17.
- ✓ Shyira KCL agafuniko ka fanta kuzuye neza mu myobo ine) mu gihe cyo gutera.



5. Imirimo y'ingenzi yo kwita ku gihingwa

- ✓ **Gusasira:** bikorwa mbere cyangwa nyuma yo gutera.
- ✓ **Kuvomerera:** Bikorwa ukimara gutera bigakomeza igihe cyose ari ngombwa. Irinde gutosa amababi kugirango uburwayi butabona aho bworokera.
- ✓ **Kongeraho Ire** ingana n'agafuniko ka fanta kuzuye kadasendereye kuri buri gihingwa ku minsi 30 nyuma yo gutera.
- ✓ **Kubagara:** Bikorwa igihe cyose ibyatsi bibi bigaragara mu murima
- ✓ Kurwanya indwara n'ibyonyi.


6. Gusarura no gufata neza umusaruro

- ✓ Puwavuro isarurwa iyo yeze neza. Bitewe n'isoko puwavuro ishobora gusarurwa ikiri mbisi cg imaze guhindura ibara bitewe n'ubwoko bwayo.
- ✓ Puwavuro igomba gusarurwa ifite inkondo.
- ✓ Irinde gukomeretsa uruti rwa Puwavuro.
- ✓ Bika umusaruro ahantu hakonje ukimara kuwusarura mu murima
- ✓ Umusaruro ushyirwa nanone ahantu hapfutse kugira ngo udatakaza ubuhehere
- ✓ Si byiza kubika umusaruro wa Puwavuro hamwe n' ibihingwa bibyara etirene (ethylene) nk'imineke ihiye, pome, n'ibindi
- ✓ Gukoresha ibikoresho bipakirwamo bijyanye n'uburyo bwakoreshejwe mu guhunika (ibikarito bifunitse cyangwa ibisanduku by'ibiti cyangwa parasitike igihe bakonjesha bakoresheje amazi cyangwa barafu, amakurete aciyemo imirongo yinjiza umuyaga ugenewe gukonjesha.
- ✓ Umusaruro utwarwa mu masaha y'igitondo cya kare cyangwa aya nijoro kuko bishobora kugabanya gushyuhirana k'umusaruro upakiye mu modoka.



7. INDWARA, IBYONNYI N'UBURYO BWO KUBIRWANYA

| Indwara/ ibyonnyi | Ibiziranga | Uko bazirinda | Uko bazivura |
|---|--|---|---|
| <p>1. Akaribata / Anthracnose</p> | <ul style="list-style-type: none"> Akaribata ni indwara yangiza cyane puwavuro yeze. Agahumyo kagira ibidomo byirabura bivamo amazi. Ibi bidomo biboneka kuri puwavuro ikiri mbisi niyeze. Aka gahumyo gakwirakwizwa n'imbuto zirwaye.  | <ul style="list-style-type: none"> Gukoresha imbuto z'indobanure zitarwaye. kugirira isuku umurima bavanamo ibisagazwa bya puwavuro nyuma y'isarura. | <ul style="list-style-type: none"> Gukoresha umuti nka chlorothalonil 50% wp (Garama 10/L10 z'amazi.), cg copper oxychloride 50%wp (Garama 37/ L15 z'amazi). |
| <p>2. Kiribiranya iterwa na bagiteri (bacterial wilt)</p> | <ul style="list-style-type: none"> Iyi ndwara akenshi ituruka mu butaka burwaye. Irangwa n'uko igihingwa kiribirana kitahinduye ibara cyane, kiba gisa nkaho cyatemwe mu mizi cyangwa cyasutseho amazi ashyushye cyangwa se cyacishijwe ku muriro. Uruti rusohokamo umushongi w'umweru usa n'amata iyo urukase ukarushyira mu mazi.  | <ul style="list-style-type: none"> Kubahiriza isimburanyabihingwa. Guhinga ubwoko bwihanganira ubu burwayi Kurandura ukajugunya kure y'umurima, igihingwa cyagaragaje ibimenyetso by'ubu burwayi ibi ukabikora ukimara kubona ibimenyetso. | <p>Nta muti uhari uvurara ubu burwayi. Ni ngombwa kubwirinda.</p> |

| | | | |
|---|---|---|---|
| <p>3. Virusi za puwavuro (Imfunyarazi, mozayike, ...)</p> | <p>Ibimenyetso by'izi virusi ni ibi bikurikira : kugwingira kw'igihingwa, kwikunja kw'amababi, kuma ibice by'amababi n'uruti, kubemba kw'amababi. Indwara ziterwa na virusi zikwirakwiza muri puwavuro n'imbutu zirwaye, isazi y'umweru n'inda z'ibihingwa.</p>  | <ul style="list-style-type: none"> • Kurwanya udukoko dukwirakwiza ubu burwayi. • Gutera imbuto itarwaye. | <p>Nta miti yihariye yica virus ahubwo ukoresha imiti irwanya udukoko dukwirakwiza iyi virus urugero : profenofos40EC Roketi (Rocket). 1ML/1L y'amazi</p> |
| <p>4. Ububore bwo mu ndiba y'urubuto (Blossom end rot)</p> | <p>-Indiba ya puwavuro ihinduka umweru wijimye. Uko puwavuro ihisha ahafashwe hahinduka umukara cg ikigina Ububore buterwa n'ibura ry'umunyungugu wa Calcium, bigaterwa cyane n'amazi make aba ari mu butaka. - Azote nyinshi mu butaka ishira igihingwa mu murongo wo kwandura iyi ndwara.</p>  | <ul style="list-style-type: none"> - Kuhira witonze mu gihe cy'ubushyuhe humagaye cyane cyane mu cyiciro cyo kuzana urubuto. - Mu gihe bigaragara ko ubutaka bwawe busharira koresha ishwagara ibiro 25 kuri Ari, yivange n'ubutaka ibyumweru bibiri mbere yo gutera -Gukoresha ifumbire igereranije. -Gusasira ubutaka hakoreshejwe isaso nziza kugira ngo bugumane ubuhehere. | <p>-</p> |

B. URUSENDA

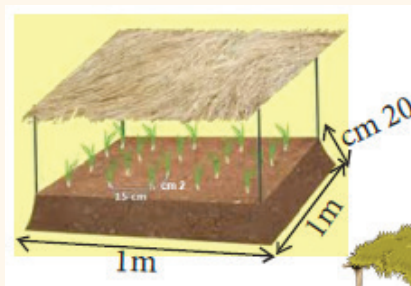


1. Inyongeramusaruro zikenewe kuri ari imwe n'ingano yazo

| Ingano y'umurama | Imborera | NPK 17.17.17 | KCl | Ire | Ingemwe |
|------------------|----------|--------------|-----|-----|---------|
| Garama 3 | 250 | 4.7 | 0.5 | 1.3 | 270 |

2. Gutegura ingemwe mu buhumbikiro

- ✓ Ubuhumbikiro bushyirwa ahantu hatigeze hahingwa ibihingwa byo mu muryango umwe n'urusenda (ibirayi, inyanya, intoryi, puwavuro n'ibindi) nibura mu bihembwe by'ihinga bibiri bishize.
- ✓ Ubuso bw'ubuhumbikiro bugomba kuba 1 % by'umurima wose uzaterwamo. Mbese metero kare imwe ku murima wa Ari imwe.



- ✓ Hategurwa ubuhumbikiro bufite ubugali bwa metero imwe kugeza kuri m 1.2 n'ubujyejuru bwa cm 20 kugirango amazi abashe gusohoka mu butaka.
- ✓ Vanga amashyi atatu y'imborera iboze neza (ibiro 3-5) n'ubutaka bwo hejuru : amashyi atatu yuzuye (kg 3-5) kuri metero kare imwe, na garama 20 za NPK 17-17-17 (udufuniko 2 tw'icupa ry'amazi) icyumweru kimwe mbere yo guhumbika.

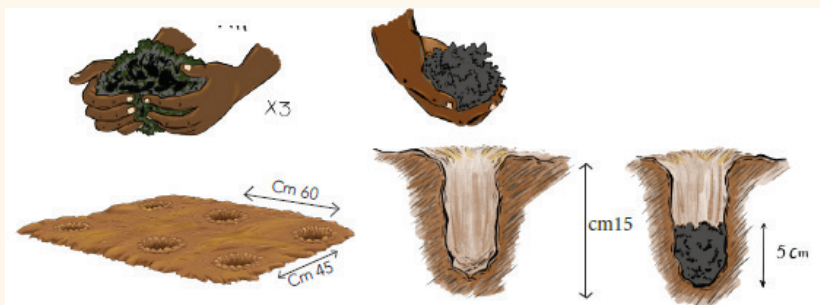
- ✓ Igihe cyo kwinaza, ringaniza ubutaka, uce imirongo yo kwinazamo ifite ubujyakuzimu bwa cm 0.5 kandi itandukanijwe na cm 10 - 15.
- ✓ Umurama ushyirwa muri ya mirongo yaciwe ku ntera ya cm 2 hagati y'imbuto; hanyuma hakarenzwaho agataka gacye bagatsindagira gahoro.

3. Imirimo ikorwa mu kwita ku buhumbikiro

- ✓ Gusasira hakoreshejwe ibyatsi byumye neza. Nyuma y'iminsi 7-10, ingemwe ziba zimaze kumaze maze isaso igakurwaho.
- ✓ Vomerera mu gitondo kare na nimugoroba.
- ✓ Ubaka igisharagati ariko usige aho imirasire y'izuba inyura haboneke urumuri ruringaniye.
- ✓ Bagara buri gihe ndetse wicire ingemwe mugihe zicucitse.
- ✓ Tera umuti urwanya indwara mu gihe ari ngombwa.
- ✓ Gabanya kuvomerera mu byumweru bibiri mbere yo kugemura.
- ✓ Ingemwe zigemurwa zimaze iminsi 45-60 mu buhumbikiro (amababi 4-5).

4. Gutera ingemwe

- ✓ Umurima uhingwa neza ku bujakuzimu bwa cm 30.
- ✓ Vomerera ingemwe mbere yo kuzitera uzitere mu gitondo kare
- ✓ Urusenda ruterwa ku ntera ya cm 60 hagati y'imirongo na cm 45 mu murongo.
- ✓ Cukura imyobo y'ubujyakuzimu bwa cm 15.
- ✓ Mu mwobo umwe hajyamo ifumbire y'imborera yuzuye amashyi n' agafuniko k' icupa ry' amazi kuzuye NPK 17- 17-17.
- ✓ Shyira KCL agafuniko ka fanta kuzuye neza mu myobo ine) mu gihe cyo gutera.



5. Imirimo y'ingenzi yo kwita ku gihingwa

- ✓ **Gusasira:** bikorwa mbere cyangwa nyuma yo gutera.
- ✓ **Kuvomerera:** Bikorwa ukimara gutera bigakomeza igihe cyose ari ngombwa. Irinde gutosa amababi kugirango uburwayi butabona aho bworokera.
- ✓ **Kongeraho Ire** ingana n'agafuniko ka fanta kuzuye kadasendereye kuri buri gihingwa ku minsi 30 nyuma yo gutera.
- ✓ **Kubagara:** Bikorwa igihe cyose ibyatsi bibi bigaragara mu murima
- ✓ Kurwanya indwara n'ibyonnyi.

6. Gusarura no gufata neza umusaruro

- ✓ Urusenda rusarurwa iyo rweze neza. Bitewe n'isoko urusenda rushobora gusarurwa rukiri rubisi cg rumaze guhindura ibara bitewe n'ubwoko bwawo.
- ✓ Urusenda rugomba gusarurwa rufite inkondo.
- ✓ Irinde gukomeretsa uruti rw'urusenda.
- ✓ Bika umusaruro ahantu hakonje ukimara kuwusarura mu murima
- ✓ Umusaruro ushyirwa nanone ahantu hapfutse kugira ngo udatakaza ubuhehere
- ✓ Si byiza kubika umusaruro w'uwurusenda hamwe n' ibihingwa bibyara etirene (ethylene) nk'imineke ihiye, pome, n'ibindi
- ✓ Gukoresha ibikoresho bipakirwamo bijyanye n'uburyo bwakoreshejwe mu guhunika (ibikarito bifunitse cyangwa ibisanduku by'ibiti cyangwa parasitike igihe bakonjesha bakoresheje amazi cyangwa barafu, amakurete aciyemo imirongo yinjiza umuyaga ugenewe gukonjesha.
- ✓ Umusaruro utwarwa mu masaha y'igitondo cya kare cyangwa aya nijoro kuko bishobora kugabanya gushyuhirana k'umusaruro upakiye mu modoka.

7. INDWARA, IBYONNYI N'UBURYO BWO KUBIRWANYA

| Indwara/ ibyonnyi | Ibiziranga | Uko bazirinda | Uko bazivura | Ibipimo bikoreshwa |
|--|---|--|--|---|
| <p>1. Akaribata / Anthracnose</p> | <p>Akaribata ni indwara yangiza cyane urusenda rweze. Agahumyo kagira ibidomo byirabura bivamo amazi. Ibi bidomo biboneka k'urusenda rukiri rubisi n'urweze. Aka gahumyo gakwirakwizwa n'imbuto zirwaye.</p>  | <ul style="list-style-type: none"> • Gukoresha imbuto z'indobanure zitarwaye. • kugirira isuku umurima bavanamo ibisagazwa by'urusenda nyuma y'isarura. | <ul style="list-style-type: none"> • Gukoresha ubwoko bwimbuto budafatwa n'indwara • Gukoresha umuti nka chlorothalonil, 50%wp cg copper oxychloride 50%wp | <p>10g/110 z'amazi. 37g/15l z'amazi</p> |
| <p>2. Kirabiranya iterwa na bagiteri</p> | <ul style="list-style-type: none"> • Iyi ndwara akenshi ituruka mu butaka burwaye. • Irangwa n'uko igihingwa kirabirana kitahinduhe ibara cyane nkaho cyatemwe mu mizi. • Uruti rusohokamo umushongi w'umweru usa n'amata iyo urukase ukarushyira mu mazi.  | <ul style="list-style-type: none"> • Kubahiriza isimburanyabihingwa. • Guhinga ubwoko bwihanganira ubu burwayi • Kurandura igihingwa cyanduye ukimara kubona Ibimenyetso. | <p>Nta muti uhari uvurara ubu burwayi. Ni ngombwa kubwirinda.</p> | <p>-</p> |

| | | | | |
|---|---|---|---|-------------------------------|
| <p>3. Virusi z'urusenda (Infunyarazi, mozayike, ...)</p> | <p>Ibimenyetso bya virusi ni ibi bikurikira : kugwingira kw'igihinga, kwikunja kw'amababi, kuma ibice by'amababi n'uruti, kubemba kw'amababi.</p>  | <ul style="list-style-type: none"> • Kurwanya udukoko dukwirakwiza ubu burwayi. • Gutera imbuto itarwaye. | <p>Nta miti yihariye yica virus. Ahubwo ukoresha imiti irwanya udukoko nka profenofos40EC</p> | <p>-1ML/1L Y'amazi</p> |
| <p>4. Ububore bwo mu ndiba y'urubuto (Blossom end rot)</p> | <ul style="list-style-type: none"> • Indiba y'urusenda ihinduka umweru wijimye, uko urusenda ruhisha ahafashwe hahinduka umukara cg ikigina . • Ububore buterwa n'ibura ry'umunyungugu wa Calcium, bigaterwa cyane n'amazi make aba ari mu butaka. • Azote nyinshi mu butaka ishyira igihingwa mu murongo wo kwandura iyi indwara.  | <ul style="list-style-type: none"> • Kuhira witonze mu gihe cy'ubushyuhe humagaye cyane cyane mu cyiciro cyo kuzana urubuto. • Gukoresha ifumbire igereranije. • Gushyira ishwagara mu butaka igihe ari ngombwa. • Gusasira Ubutaka kugirango bugumana ubuhehere. | <ul style="list-style-type: none"> • Mu gihe bigaragara ko ubutaka bwawe busharira koresha ishwagara ibiro 25 kuri ari. yivange n'ubutaka ibyumweru bibiri mbere yo gutera | <p>-</p> |

C. INYANYA

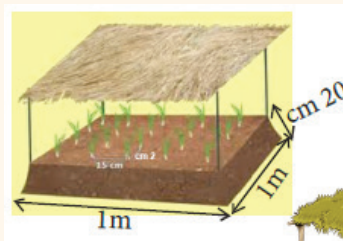


1. Inyongeramusaruro zikenewe kuri ari imwe n'ingano yazo

| Ingano y'umurama | Imborera | NPK 17.17.17 | Ire | Ingemwe |
|------------------|----------|--------------|-----|---------|
| Garama 2 | 250 | 3 | 1.3 | 270 |

2. Gutegura ingemwe mu buhumbikiro

- ✓ Ubuhumbikiro bushyirwa ahantu hatigeze hahingwa ibihingwa byo mu muryango umwe n'inyanya (ibirayi, intoryi, urusenda, puwavuro n'ibindi) nibura mu bihembwe by'ihinga bibiri bishize.
- ✓ Ubuso bw'ubuhumbikiro bugomba kuba 1 % by'umurima wose uzaterwamo. Mbese metero kare imwe ku murima wa Ari imwe.



- ✓ Hategurwa ubuhumbikiro bufite ubugali bwa metero imwe kugeza kuri m 1.2 n'ubujyejuru bwa cm 20 kugirango amazi abashe gusohoka mu butaka.
- ✓ Vanga amashyi atatu y'imborera iboze neza (ibiro 3-5) n'ubutaka bwo hejuru : amashyi atatu yuzuye (kg 3-5) kuri metero kare imwe, na garama 20

za NPK 17-17-17 (udufuniko 2 tw'icupa ry'amazi) icyumweru kimwe mbere yo guhumbika.

- ✓ Igihe cyo kwizaza, ringaniza ubutaka, uce imirongo yo kwizazamo ifite ubujyakuzimu bwa cm 0.5 kandi itandukanijwe na cm 10 - 15.
- ✓ Umurama ushyirwa muri ya mirongo yaciwe ku ntera ya cm 2 hagati y'imbutu; hanyuma hakarenzwa agataka gacye bagatsindagira gahoro.

3. Imirimo ikorwa mu kwita ku buhumbikiro

- ✓ Gusasira hakoreshejwe ibyatsi byumye neza. Nyuma y'iminsi 4-7, ingemwe ziba zimaze kumera maze isaso igakurwaho.
- ✓ Vomerera mu gitondo kare na nimugoroba.
- ✓ Ubaka igisharagati ariko usige aho imirasire y'izuba inyura haboneke urumuri ruringaniye.
- ✓ Bagara buri gihe ndetse wicire ingemwe mugihe zicucitse.
- ✓ Tera umuti urwanya indwara mu gihe ari ngombwa.
- ✓ Gabanya kuvomerera mu byumweru bibiri mbere yo kugemura.
- ✓ Ingemwe zigemurwa zimaze ibyumweru 4 mu buhumbikiro (amababi 3-4).

4. Gutera ingemwe

- ✓ Umurima uhingwa neza ku bujakuzimu bwa cm 30.
- ✓ Vomerera ingemwe mbere yo kuzitera uzitere mu gitondo kare
- ✓ Inyanya ziterwa ku ntera ya cm 60 hagati y'imirongo na cm 45 - 60 mu murongo.
- ✓ Cukura imyobo y'ubujyakuzimu bwa cm 15.



5. Imirimo y'ingenzi yo kwita ku gihingwa

- ✓ **Gusasira:** bikorwa mbere cyangwa nyuma yo gutera.

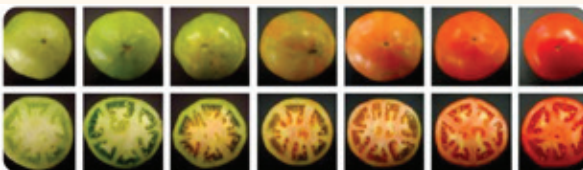
- ✓ **Kuvomerera:** Bikorwa ukimara gutera bigakomeza igihe cyose ari ngombwa. Irinde gutosa amababi kugirango uburwayi butabona aho bwororokera.
- ✓ **Gushyiraho imfumbire mvaruganda:** kuri buri rugemwe bashyiraho garama 10 (agapfundikizo kuzuye k'icupa ry'amazi) za NPK 17-17-17 icyumweru kimwe nyuma yo gutera na garama 5 (agafuniko kuzuye kadasendereyi k'icupa rya Fanta) ibyumweru 6 nyuma yo gutera (kugemura). Iyi fumbire ishyingira ku muzenguruko w'urugemwe aho iminzi igarukira.



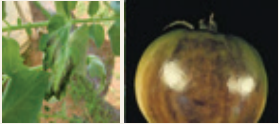


- ✓ **Kubagara:** Bikorwa igihe cyose ibyatsi bibi bigaragara mu murima
- ✓ **Kurwanya indwara n'ibyonnyi.**

6. Gusarura no gufata neza umusaruro

- ✓ Sarura inyanya ugendeye kuzo abaguzi bifuza.
- ✓ Ibara inyanya zifite niryo ryerekana uko zihye
- ✓ Sarura mugitondo cg nimugororoba kugirango uzirinde kwangizwa n'izuba
- ✓ Koresha icyuma cg umukasi ufite isuku mu kwirinda indwara.
- ✓ Tandukanya inyanya zihye cyane n'izidahiye neza wirinda ko zatera izindi kubora.
- ✓ Koresha amakurete, amabase cg ibitebo bikomeye kandi wirinde kubyuzura cyane kugirango wirinde ko zangirika mu gihe cyo kuzikorera.
- ✓ Irinde gutera umuti wica udukoko ku nyanya zasaruwe.
- ✓ Sarura gusa inyanya zitangiritse



7. INDWARA N'IBYONNYI

| Indwara/ ibyonnyi | Ibiziranga | Uko bazirinda | Uko bazivura |
|---|---|---|--|
| <p>1. Indwara y'imvura (Kababu)</p> | <ul style="list-style-type: none"> • Iyi ndwara ikara cyane mu gihe cy'ubukonje n'ubuhere bwinshi, • Ikwirakwira vuba ikaba yakwangiza igihingwa mu gihe gito, • Iyi ndwara ifata ibice byose by'igihingwa. Ibimenyetso bigaragara muni y'amababi nkuruhumbu naho hejuru y'amababi bisa nkicyababutse.  | <ul style="list-style-type: none"> • Gusimburanya ibihingwa. • Isuku mu murima. • Kudatera ingemwe hafi y'inyanya zikuze. • Kuvanaho ibisambo kugirango urumuri rubashe kwinjira mo. • Gutera umuti urimo Mancozeb (Dithane, Safari- Zeb) cyangwa Mancozeb + Metalaxyl (Ridomyl, Victory,...). | <ul style="list-style-type: none"> • Gutera umuti urimo Mancozeb + Metalaxyl (Ridomyl, Victory,...). gukoresha imiti irimo cuivre nka FUGURAN • (Vanga garama 50 z'umuti muri litiro 20 z'amazi) |
| <p>Indwara y'ibidomo ku mababi n'imbuta (Early Blight)</p> | <p>Iyi ndwara iterwa n'agahumyo kitwa <i>Alternaria solani</i>. Ikgaragazwa n'ibidomo bisa n'ikigina birimo inziga ku mababi, ku ruti no kumbuto aho inkondo ifatiye. Ikunda kuboneka mu bice bishyuha kandi bifite ubuherehere buke.</p>  | <ul style="list-style-type: none"> • Gusimburanya ibihingwa bitari mu muryango umwe nyuma y'ibihembwe bitatu, • Kwirinda ko umurima urekamo amazi, • Gukura mu murima ibisigazwa by'inyanya, • Guha igihingwa ifumbire ihagije. Ibyiza ni ushyiramo inyongeramusaruro mu byiciro bitatu. | <p>Gutera imiti yica udhumyo nka Carbendazim, Copper, Tricyclazole (Beem), Chlorothalonil, Thiovit, Mancozeb (Vanga garama 50 z'umuti muri litiro 20 z'amazi)</p> |
| <p>2. Kirabiranya iterwa na bagiteri</p> | <ul style="list-style-type: none"> • Iyi ndwara akenshi ituruka mu butaka burwaye. • Irangwa n'uko igihingwa kirabirana kidahinduye ibara cyane nkaho cyatemwe mu mizi. • Uruti rusohokamo umushongi w'umweru usa n'amata iyo urukase ukarushyira mu mazi.  | <ul style="list-style-type: none"> • Kubahiriza isimburanya bihingwa. • udakomeretsa imizi cyangwa amababi mu gihe cyo gutera, gukuraho ibisambo,... • Guhinga mu butaka bwumutse. • Kurandura igihingwa cyafashwe ukimara kubona Ibimenyetso. | <p>Nta muti uhari uvurara ubu burwayi. Ni ngombwa kubwirinda.</p> |

| | | | |
|---|--|---|--|
| <p>3. Virusi z'inyanya (Infunyarazi, mozayike,)</p> | <p>Ibimenyetso bya virusi ni ibi bikurikira : kugwingira kw'igihinga, kwikunja kw'amababi, kuma ibice by'amababi n'uruti, kubemba kw'amababi.</p> <p>Indwara ziterwa na virusi zikwirakwizwa mu nyanya n'imbuto zirwaye, isazi y'umweru thrips n'inda z'ibihingwa.</p>  | <ul style="list-style-type: none"> • Kurwanya udukoko dukwirakwiza ubu burwayi. • Gutera imbuto itarwaye. • Kudakomeretsa igihingwa mu gihe cyo gutera, gukuraho ibisambo,... | <p>Nta miti yihariye yica virus.</p> |
| <p>4. Ububore bwo mu ndiba y'urubuto (Blossom end rot)</p> | <ul style="list-style-type: none"> • Ububore buterwa n'ibura ry'umunyungugu wa kalisiyumu, bigaterwa cyane n'amazi make aba ari mu butaka. • Mu bihe by'ubushyuhe cg igihe hirwe humagaye bakavomereza amazi menshi, bituma igihingwa kidashobora gufata vuba kalisiyumu mubutaka.  | <ul style="list-style-type: none"> • Kuhira witonze mu gihe cy'ubushyuhe humagaye cyane cyane mu cyiciro cyo kuzana urubuto. • Gukoresha ifumbire y'imborera ihagije. • Gushyira ishwaraga mu butaka igihe ari ngombwa. • Gusasira Ubutaka kugirango bugumane ubuhehere. | <p>-</p> |
| <p>Urunyo rw'amababi n'imbuto</p> | <p>Ni ikinyugunyugu bita <i>Tuta absoluta</i>, gitera amagi ku mababi inyo zinjira mu mababi. Zitobora n'imbuto z'inyanya zikinjiramo imbere.</p>  | <ul style="list-style-type: none"> • Gusimburanya ibihingwa mu murima hahingwa ibindi bitari mu muryango umwe n'inyanya nk'ibigoli, ibishyimbo, amashu,... • Gukuramo ibisambo n'inyanya zamaze gufatwa bigatabwa, • Gukoresha imitego ifata ibinyugunyugu mu murima no munkengeru zawo. | <p>Guter imiti yica udukoko nka abamectin (ml 10 ml z'umuti muri litiro 20 z'amazi), imidacloprid (ml 20 ml z'umuti muri litiro 20 L z'amazi,)</p> |

| | | | |
|--|---|---|--|
| <p>5. Ibyonnyi (Inda, Isazi y'umweru na Tiripusi)</p> | <p>Ubu busimba bukunze gufata cyane cyane amababi n'uruti bikiri bito, indabo n'amababi. Inda na tiripusi bikwirakwiza virusi kubihingwa.</p>  <p>Inda amasazi y'umweru Tiripusi</p> | <ul style="list-style-type: none"> • Gukikiza ibigori umurima w'inyanya kuko aryohera cyane agakurura inda zikava ku nyanya. • Kubungabunga inshuti z'abahinzi (udukoko turya inda. Urugero: udusurira, urutambara,...) • Kwirinda guhora ukoresha ubwoko bw'umuti umwe kuko inda ziwumenyere ntizipfe ahubwo zikororoka vuba. • Gukoresha imitego y'ibara ry'umuhondo izifata. | <p>Guter imiti yica udukoko nka abamectin (ml 10 ml z'umuti muri litiro 20 z'amazi), Cypermethrin (ml 20 ml z'umuti muri litiro 20 L z'amazi, Profenofos + Cypemethrine (ml 20 ml z'umuti muri litiro 20 L z'amazi</p> |
|--|---|---|--|

D. IBITUNGURU



1. Inyongeramusaruro zikenewe kuri ari imwe n'ingano yazo

| Ingano y'umurama | Imborera | NPK 17.17.17 | KCl | Ire | Ingemwe |
|------------------|----------|--------------|-----|-----|---------|
| Garama 40 | 250 | 3 | 1.8 | 1.5 | 3,600 |

2. Gutegura ingemwe mu buhumbikiro

- ✓ Ubuhumbikiro bushyirwa ahantu hatigeze hahingwa ibihingwa byo mu muryango umwe n'ibitunguru (tungurusumu, n'ibindi) nibura mu bihembwe cy'ihinga gishize.
- ✓ Ubuso bw'ubuhumbikiro bugomba kuba 4 % by'umurima wose uzaterwamo. Mbese metero kare enye ku murima wa Ari imwe.
- ✓ Hategurwa ubuhumbikiro bufite ubugali bwa metero imwe kugeza kuri m 1.2 n'ubujejuru bwa cm 20 kugirango amazi abashe gusohoka mu butaka.
- ✓ Vanga amashyi atatu y'imborera iboze neza (ibiro 3-5) n'ubutaka bwo hejuru : amashyi atatu yuzuye (kg 3-5) kuri metero kare imwe, na garama 20 za NPK 17-17-17 (udufuniko 2 tw'icupa ry'amazi) icyumweru kimwe mbere yo guhumbika.

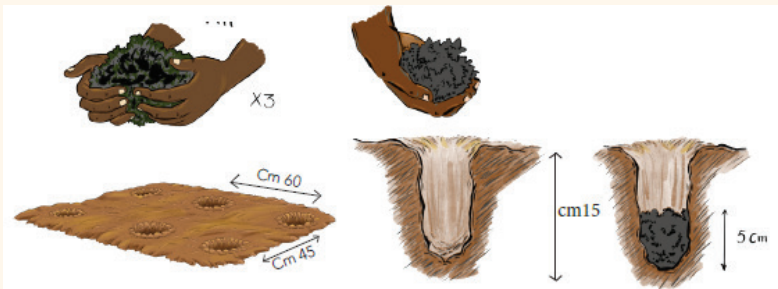
- ✓ Igihe cyo kwinaza, ringaniza ubutaka, uce imirongo yo kwinazamo ifite ubujyakuzimu bwa cm 0.5 kandi itandukanijwe na cm 5.
- ✓ Umurama ushyirwa muri ya mirongo yaciwe ku ntera ya cm 1 hagati y'imbuto; hanyuma hakarenzawho agataka gacye bagatsindagira gahoro.

3. Imirimo ikorwa mu kwita ku buhumbikiro

- ✓ Gusasira hakoreshejwe ibyatsi byumye neza. Nyuma y'iminsi 7-10, ingemwe ziba zimaze kumera maze isaso igakurwaho.
- ✓ Vomerera mu gitondo kare na nimugoroba.
- ✓ Ubaka igisharagati ariko usige aho imirasire y'izuba inyura haboneke urumuri ruringaniye.
- ✓ Bagara buri gihe ndetse wicire ingemwe mugihe zicucitse.
- ✓ Tera umuti urwanya indwara mu gihe ari ngombwa.
- ✓ Gabanya kuvomerera mu byumweru bibiri mbere yo kugemura.
- ✓ Ingemwe zigemurwa zimaze ibyumweru 6 - 8 mu buhumbikiro

4. Gutera ingemwe

- ✓ Umurima uhingwa neza ku bujakuzimu bwa cm 30.
- ✓ Vomerera ingemwe mbere yo kuzitera uzitere mu gitondo kare
- ✓ Ibitunguru biterwa ku ntera ya cm 20 hagati y'imirongo na cm 10 hagati y'igitunguru n'ikindi mu murongo.
- ✓ Ca uduferege dufite ubujyakuzimu bwa cm 5.
- ✓ Ushyiremo imborera (yuzuyeye amashyi), NPK 17-17-17 (agafuniko ka fanta kuzuye ku murongo wa metero 1) na KCl (agafuniko kamwe ka fanta ku murongo wa metero ebyiri) uyivange neza n'itaka.



5. Imirimo y'ingenzi yo kwita ku gihingwa

- ✓ **Gusasira:** bikorwa mbere cyangwa nyuma yo gutera.
- ✓ **Kuvomerera:** Bikorwa ukimara gutera bigakomeza igihe cyose ari ngombwa. Irinde gutosa amababi kugirango uburwayi butabona aho bworokera.
- ✓ **Kongeraho Ire:** Nyuma y'ibyumweru 6 uteye, shyiramo ifumbire ya Ire ingana na kg 1.5 kuri ari (agafuniko kamwe ka fanta ku murongo wa metero imwe).
- ✓ **Kubagara:** Bi bikorwa igihe cyose ari ngombwa kandi ukaboneraho gusukira wegereza itaka ku bitunguru.
- ✓ **Kurwanya indwara n'ibyonnyi.**

6. Gusarura no gufata neza umusaruro

- ✓ Ibitunguru biba bigeze igihe cy'isarura igihe imitwe ireba hasi, ni ukuvuga hagati y'amezi 3-4 bitewe n'ubwoko bw'ibitunguru.
- ✓ Mbere yo gusarura ukuraho itaka ritwikiriye ikijumba cy'igitunguru habura nibura ibyumweru bibiri ngo usarure.



- ✓ Gusarura ibitunguru ubirandura ukoresheje intoki, iyo hakomeye ugakoresha agacyamuro.
- ✓ Nyuma yo gusarura, sanza ibitunguru ku mbuga isukuye neza cyangwa ubundi bwanikiro bwabugenewe kandi wanike ahantu hagera izuba; ubireke byume kugeza igihe imizi n'amababi byumye.
- ✓ Katira amababi nko kuri cm 2.5 hejuru y'ikijumba cy'igitunguru ndetse unakate yamizi yumye.
- ✓ Ibitunguru bikomeza kwanikwa ahagera imirasire y'izuba itari myinshi kandi hagera umwuka mu gihe cy'ibyumweru 2-3.
- ✓ Ibitunguru bibikika neza igihe ijosi ryabyo ryumywe neza kuburyo urikanda ukabona nta mazi akirimo.
- ✓ Umusaruro w'ibitunguru ushobora kugera kuri toni 25 kuri hegitari.

7. Indwara n'ibyonnyi by'ingenzi by'ibitunguru

| Indwara/ ibyonnyi | Ibiziranga | Uko bazirinda | Uko bazivura | Ibipimo bikoreshwa |
|--|---|--|--|----------------------------|
| <p>1.Indwara y' imvura (Milidiyu)</p> | <p>Ibidomo cyangwa amabara byeruruka ku mababi bitwikiriwe n'agafu k'ikigina. Amababi areruruka nyuma akaba umuhondo. Imitwe y'amababi iruma.</p>  | <ul style="list-style-type: none"> • Kwirinda gutera ingemwe zirwaye, • Gusimburanya neza ibihingwa, • Gutera mu butaka bwumutse, • Kudacucika ibitunguru igihe cyo gutera, • Kuvana mu murima ibisagazwa by'ibihingwa bigakorwamo ifumbire, • Gutera umuti wo kurwanya uduhumyo. | <ul style="list-style-type: none"> • Gutera umuti urimo Mancozeb + Metalaxyl cyangwa gukoresha imiti irimo copper nka Copper oxychloride. | <p>37.5g/15l z'amazi.</p> |
| <p>2.Indwara y' ibidomo (Ariterinari-yoze)</p> | <p>Iyi ndwara igaragara mu gihe cy'imvura nyinshi.</p> <p>Itangira igaragazwa n'ibikomere biretse amazi ku mababi nyuma bikaba ikigina. Nyuma, irangwa n'ibidomo byijimye imbere ariko byerurutse ku muzenguruko wabyo.</p>  | <ul style="list-style-type: none"> • Gutera igihe cyiza bitewe n'aho umurima uherereye, • Amoko y'ibitunguru bigira ubwoya yihanganira ubu burwayi ugereranije n'atabugira, • Gutera ku mitabo, no gutegura neza umurima. • Kudacucika ibitunguru igihe cyo gutera, • Gusimburanya ibihingwa, • Kuvana mu murima ibisigazwa by'ibihingwa, • Gutera mu butaka bwumutse . • Icyitonderwa : Ubutaka burekamo amazi ntibuberanye n'ibitunguru. | <ul style="list-style-type: none"> • Gutera umuti urimo Mancozeb + Metalaxyl cyangwa gukoresha imiti irimo copper nka Copper oxychloride. | <p>37.5g/ 15L z'amazi.</p> |

| | | | | |
|-----------------------------|--|---|---|----------------------------|
| <p>3. Umugese</p> | <p>Iyi ndwara igaragara cyane igihe cy'ubuherehe bwinshi buvanze n'ubushyuhe buringaniye cyangwa buke.</p> <p>Iyi ndwara ifata kumababi ikarangwa n'ibidomo bifite ifu ifite ibara rishyira umutuku cyangwa orange nyuma bikaba umukara.</p> <p>Amababi yafashwe cyane ahinduka umuhondo nyuma agahita yuma atarakura bityo bigatuma umusaruro ugabanuka.</p>  | <ul style="list-style-type: none"> • Gutera ku mitabo, • Kudacucika ibitunguru igihe cyo gutera, • Gusimburanya ibihingwa, • Kuvana mu murima ibisigazwa by'ibihingwa, • Kwirinda gufumbiza azote irengije ikigero cyagenwe. | <p>Gukoresha imiti irimo copper nka Copper oxychloride cyangwa Copper Oxide</p> | <p>37.5g/ 15L z'amazi.</p> |
| <p>4. Tiripusi (Thrips)</p> | <p>Tiripusi ni udukoko duto cyane (mm1) kandi kagenda cyane. Twangiza ibitungura turuma abababi tukanyunyuzwa amatembagihingwa.</p> <p>Amababi yafashwe agira amabara y'umweru avanze n'ibidomo by'umuringa. Utu dukoko dusiga umwanda ugaragazwa ku mababa nk'utudomo tw'umukara.</p> <p>Utu dusimba tugomba kugenzurwa hakiri kare kuko tugira ingaruka ikomeye ku musaruro.</p>  | <ul style="list-style-type: none"> • Ubutaka bugomba guhora bufite amazi ahagije; • Kwirinda gukoresha ifumbire ya Azote irenze urugero; • Kubagara neza kuko utu dukoko twihisha mu bwatsi; • Gusukura ahakikije umurima; • Kurandura ibyafashwe cyane; | <p>Gutera imiti yica udukoko irimo profenofos (nka Profenofos 40EC, Rokat, ...)</p> | <p>1 ml/1l y'amazi</p> |

E. TUNGURUSUMU



1. Inyongeramusaruro zikenewe kuri ari imwe n'ingano yazo

| Ingano y'imbutu | Imborera | NPK 17.17.17 | KCl | Ire |
|--------------------------|----------|--------------|-----|-----|
| Iburo 5 (Ibijumba 3,600) | 250 | 3 | 1 | 0.8 |

2. Gutegura imbuto

Tungurusumu iterwa hifashishijwe ibijumba. Ni ngombwa ko umuhinzi agezura ko imbuto ntaturwayi ifite kandi agategura ibijumba bifite umubyimba wa mm8-10

3. Gutera

Hinga neza ku bujakuzimu bwa cm 30; urunganie umurima kandi, umenagure ibinonko byose ndetse ukuremo amabuye n'ibyatsi.

Ca uduferege dufite ubujakuzimu bwa cm 5 dutandukanijwe na cm 20.

Ushyiremo imborera (yuzuyeye amashyi), NPK 17-17-17 (agafuniko ka fanta kuzuye ku murongo wa metero 1) na KCl (agafuniko kamwe ka fanta ku murongo wa metero ebyiri) uyivange neza n'itaka.

Mu gihe cyo gutera siga intera ingana na cm 10 hagati y'ikijuma n'ikindi mu murongo woroseho itaka rike hejuru y'ibijumba

4. Imirimo y'ingenzi yo kwita ku gihingwa

- **Gusasira:** Ukimara gutera, sasira umurima wawe ukoresheje ibyatsi byumye neza.
- **Kuvomerera:** Bikorwa ukimara gutera bigakomeza igihe cyose ari ngombwa. Irinde gutosa amababi kugirango uburwayi butabona aho bworokera.

- **Kubagara:** Bikorwa igihe cyose hagarayemo ibyatsi bibi. Kunyuzwa isuka mu murima mbere yuko ibijumba bitangira gukura nibyiza kuko byoroshye ubutaka bikabona aho bibyibuhira. Ntabwo ari byiza guhinga mu murima wa tungurusumu ibijumba byaramaze gukura kuko byatuma byangirika.
- **Kongeraho Ire:** Nyuma y'ibyumweru 6 uteye, shyiramo ifumbire ya Ire ingana n'agafuniko kamwe ka fanta ku murongo wa metero imwe.
- **Kurwanya indwara n'ibyonnyi:** bikorwa kimwe nko ku bitunguru.

5. Gusarura no gufata neza umusaruro

- ✓ Tungurusumu isarurwa iyo imitwe yayo imaze guhinduka umuhondo cg ikigina.
- ✓ Ibijumba byayo byera nyuma y'iminsi 130-180 umaze gutera bitewe n'ubwoko n'igihe cy'ihinga.
- ✓ Gusarura kare bituma umusaruro wangirika kimwe nuko gutinda gusarura bituma ibijumba bimerera mu murima
- ✓ Tungurusumu isarurwa bakurura imitwe yayo ubutaka bworoshye cg se ugakoresha ikindi gikoresho mu koroshya ubutaka.
- ✓ Umusaruro wa tungurusumu kuri hegitari uba hagati ya toni 10-20 bitewe n'ubwoko
- ✓ Tungurusumu zanyikwa mu gicucu mugihe cy'iminsi 7-10 kugira ngo amazi agabanukemo bityo zigakomera.
- ✓ Tungurusumu ushobora kuzanika zifite imitwe cg wayiciriye kuri cm 2.5 uvuye ku kijumba.
- ✓ Tungurusumu zumutse neza zishobora kubikwa igihe kirekire ahantu hose hahitisha umwuka.

F. WATERMELON



1. Inyongeramusaruro zikenewe kuri ari imwe n'ingano yazo

| Ingano y'umurama | Imborera | NPK 17.17.17 | Ire | Ingemwe |
|------------------|----------|--------------|------------|---------|
| Garama 5 | 250 | Kg 3.5 | Garama 650 | 50 |

2. Gutegura ingemwe mu bihoho

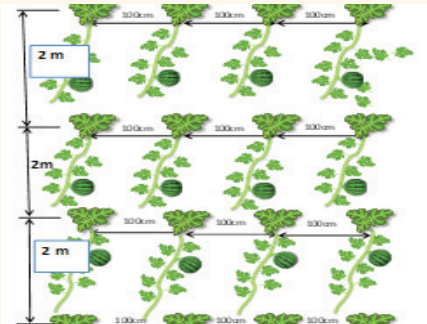
- ✓ Umurama uhumbikwa mu bihoho bifite umurambararo wa cm 7.5 kandi bikoze mubirere cyangwa iby'amashashi.
- ✓ Ibihoho bipakirwamo itaka n'imborera iboze neza ku ngero za 2:1 (Urugero: Ibitebo bibiri by'itaka bivangwa n'igitebo kimwe cy'ifumbire); bongeramo n'agafumbire gake ka NPK 17-17-17 kangana na garama 5 (agafuniko kamwe ka fanta) mu bihoho bibiri.
- ✓ Imbutu imwe iterwa muri buri gihoho ku bu buyakuzima bwa cm 0.5-1.
- ✓ Ibihoho bishyirwa ahantu hatwikiriye kugirango ingemwe zirindwe kwicwa n'izuba ariko ugomba gusiga aho imirasire y'izuba inyura kuko ingemwe ziba zirikeneye ku rugero ruringaniye.
- ✓ Ni ngombwa kuvomerera buri muni mu gitondo kare no kumugoroba.
- ✓ Ingemwe ziterwa hashize ibyumweru 4-6 nyuma yo kwinaza zifite amababi 2-4 utabariyemo amababi y'ingarama.

3. Gutera ingemwe

- ✓ Hinga neza ku buyakuzimu bwa cm 30, Ringaniza, Kuramo amabuye n'ibyatsi byose.
- ✓ Cukura imyobo ingana na cm 30 z'umurambararo na cm 30 z'ubuyakuzimu ku ntera ya m 2 kuri m1.
- ✓ Shyira muri buri mwobo ibiro bitanu by'imborera (amashyi 5), na garama 35 za NPK 17-17-17 (udufuniko 3.5 tw'agacupa k'amazi). Ifumbire ivangwa neza n'itaka.
- ✓ Kura ingemwe mu bihoho maze uzitere mu myobo yateguwe witonze ku buryo itaka ryo ku mizi rigumaho.

4. Imirimo y'ingenzi yo kwita ku gihingwa

- ✓ **Gusasira:** Ni ngombwa gusasira watameroni hakoreshwa ibyatsi byumye neza.
- ✓ **Kuvomerera:** Nyuma yo gutera ni ngombwa guhita bavomerera. Irinde gutosa amababi kugirango hatabaho kororoka kwihuse kw'indwara ziterwa n'uduhumyo.
- ✓ **Kubagara:** Kubagara bikorwa igihe cyose ibyatsi bibi bigaragara mu murima.
- ✓ **Kongeramo ifumbire y'imvaruganda:** kuri buri rugemwe bongeraho garama 35 (udufuniko 3.5 tw'icupa ry'amazi) za NPK 17-17-17 nyuma y'iminsi 30 bateye na garama 13 (agafuniko kuzuye k'icupa ry'amazi) za Urea nyuma y'iminsi 60 bateye. Iyi fumbire ishyingirwa ku muzenguruko w'urugemwe aho imizi igarukira.
- ✓ **Kwicira umugozi:** Kugirango watameroni igire imigozi myiza izeraho ibihaza, ni ngombwa guca umutwe w'umumero nyuma y'amababi 6. Ibi bituma hashibuka amashami maze umuhinzi agahitamo amashami 4 meza. Kuri aya mashami 4, ni byiza ko rimwe ridaheka ibihaza kugirango rizatunge ayandi.
- ✓ **Kurwanya indwara n'ibyonnyi**



Ishusho y'umurima wa wotameloni



Umurima usasiye



Guca umutwe nyuma y'amababi 6





Kuzana imbuto (ibyumeru 8 nyuma yo kwinaza)

5. Gusarura no gufata neza umusaruro

- ✓ Kuva uteye ugomba gutegereza nibura iminsi 90-120 ugangira kureba ibimenyetso byuko ibihaza bikomeye byasarurwa. Ibiranga igihaza cya wotameloni cyeye ni ibi bikurikira:

- Utugozi tugenda dufata kubyatsi tugenda duhinduka umuhondo cyangwa tukuma.
 - Igihaza gihindura ijwi iyo ugikubise nikiganza kivuga n'ijwi rinini, ariko bisaba ubuhanga cyangwa kubimenyera kugirango ubimenye.
 - Imigozi myinshi mumurima igenda igaragara nkihonga cyangwa ikuma.
- ✓ Sarura neza igihaza kugirango kimare igihe. Ningombwa cyane kugisarurana n'inkondo.
- ✓ Mu gusarura, wirinda kuba igihaza cyagucika kikikubita hasi kuko gisaduka vuba.
- ✓ Igihaza kuva igihe cyasaruriwe, gishobora kumara nibura ibyumweru bibiri (2) kigifite ubuzima.

6. Indwara n'ibyonnyi byingenzi by'ibitunguru

| Indwara/ibyonnyi | Ibiziranga | Uko bazirinda | Uko bazivura | Ibipimo bikoreshwa |
|------------------------------------|--|---|--|--------------------|
| 1. Milidiyu y'ifu (Powdery mildew) | <p>Ibido mu cyangwa amabara byeruruka ku mababi bitwikiriwe n'agafu k'ikigina. Amababi areruruka nyuma akaba umuhondo. Imitwe y'amababi iruma.</p>  | <ul style="list-style-type: none"> • Gusimburanya neza ibihingwa, • Kuvana mu murima ibisagazwa by'ibihingwa bigakorwamo ifumbire, • Gutera umuti urimo sufure cyangwa cuivre. | <ul style="list-style-type: none"> • Gutera umuti urimo sufure nka Sulfur 80% (Thiovit) cyangwa umuti urimo cuivre nka Kopper oxychloride | 37.5g/15l z'amazi. |
| 2. Indwara y'imvura (Downy mildew) | <p>Iyi ndwara irangwa n'ibara ry'umuhondo ukeye ku bice by'ikibabi. Mu gihe cy'ubukonje, uruhumbu rufite ibara ry'ikijuju gishyira umweru rugaragara mu nsi y'amababi.</p> <p>Amababi arwaye arihinahina hanyuma akuma.</p> <p>Iyi ndwara ikwirakwizwa n'imvura n'umuyaga.</p>  | <ul style="list-style-type: none"> • Kwirinda gutera ingemwe zirwaye, • Gusimburanya neza ibihingwa, • Gutera mu butaka bwumutse, • Kudacucika ibitunguru igihe cyo gutera, • Kuvana mu murima ibisagazwa by'ibihingwa bigakorwamo ifumbire, • Gutera umuti wo kurwanya uduhumyo. | <ul style="list-style-type: none"> • Gutera umuti urimo Mancozeb + Metalaxyl cyangwa gukoresha imiti irimo copper nka Copper oxychloride. | 37.5g/15l z'amazi. |

| | | | | |
|---|--|---|--|---------------------------|
| <p>3. Kirabiranya/ (Fusarium wilt)</p> | <p>Amababi agenda ararabirana ahereye ku yakuza, nyuma n'imigozi yose igafatwa bikuma.</p>  | <ul style="list-style-type: none"> • Gukoresha imbuto nziza mu gihe ugiye gutera, • Kuhira ubutaka cyane mugihe cy'izuba, • Gukurikiranya neza ibihingwa. • Kubangurira | <p>Kurandura ibyafashe.</p> | |
| <p>4. Akaribata (anthracnose)</p> | <p>Ni indwara yangiza cyane wotameloni n' ibindi bihaza. ifata ibice byo hejuru y' ubutaka. Igaragazwa n' ibidomo by' ikigina ku mababi akuze, ahafashwe nyuma haruma hakaba umukara ndetse hagatoboka.</p> <p>Ibimenyetso byo ku mababi bishobora no kugaragara no ku gihaza(imyobo y' ikigina ku gihaza).</p>  | <ul style="list-style-type: none"> • Gutera imbuto zihanganira indwara, • Gusimburanya neza ibihingwa: • Kurandura inzuzi z'ibihaza zimejeje. | <ul style="list-style-type: none"> • Gutera umuti urimo Mancozeb + Metalaxyl cyangwa gukoresha imiti irimo copper nka Copper oxychloride. | <p>37.5g/15l z'amazi.</p> |
| <p>5. Inda/ Ubuhunduguru</p> | <p>Ni agakoko gafite nka mm 1-2 z'uburebure ; gatungwa no kunyunyuzwa ibimera gafasheho. Gafata cyane cyane amababi n'uruti bikiri bito, indabo n'amababi yo hasi. Inda zikwirakwiza virusi nyinshi zitera indwara. Umushongi w'inda ukurura uduhumyo tw'umukara dukwikira ikibabi bigatuma kitakore neza ibitungagihingwa.</p> | <ul style="list-style-type: none"> • Kubungabunga inshuti z'abahinzi (udukoko turya inda. Urugero: Utunyamacwende, urutambara,...) • Kwirinda guhora ukoresha ubwoko bw'umuti umwe kuko inda ziwumenyere ntizipfe ahubwo zikororoka vuba. | <p>Gutera imiti yica udukoko nka Lambda-Cyhalothrin, imidacloprid, acetamiprid, abamectin, nimbecidine (azadirachtin)</p> | <p>1 ml/1l y'amazi</p> |

G. IMITEJA

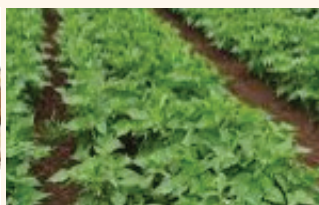


1. Inyongeramusaruro zikenewe kuri ari imwe n'ingano yazo

| Ingano y'imbutu | Imborera | DAP | KCl | Ire |
|-----------------|----------|--------|-----|------------|
| Garama 500 | 250 | Kg 1.6 | 1.3 | Garama 500 |

2. Gutera

- ✓ Sekera mbere y'ibyumweru bibiri imvura itaragwa, usanze neza mu gihe cy'itera.
- ✓ Koresha buri gihe imbutu yujuje ubuziranenge ipakiye mu gapaki keza, ivuye ku mucuruzi wizewe, ifite ubwiza kandi ikihanganira indwara.
- ✓ Gucukura uduferege dufite ubujyakuzimu bwa cm 10 kandi dutandukanijwe na cm 40.
- ✓ Shyira muri buri gaferege imborera iboneze neza. Hakoreshwa amashyi yuzuye neza ku murongo wa metero imwe.
- ✓ Ongeraho DAP yuzuye agafuniko kamwe ka Fanta kuzuye cyane ku murongo wa metero imwe (ijya kuri ari imwe ni kg 1.6).
- ✓ Ongeraho DAP yuzuye agafuniko kamwe ka Fanta kuzuye cyane ku murongo wa metero imwe (ijya kuri ari imwe ni kg 1.3).
- ✓ Shyira intete mu gaferege ku ntera ya cm 10.
- ✓ Twikira neza n'itaka kuburyo utamenya aho agaferege kari gacukuye.



3. Imirimo y'ingenzi yo kwita ku gihingwa

✓ **Kuvomerera:**

- Gushyiramo amazi buri gihe ni ngombwa cyane kuko ubuhehere bugira ingaruka ku ireme n'ubwiza bw'umusaruro.
- Kubura amazi mu gihe cy'ururabo bitera cyane kuma k'ururabo bityo umusaruro ukagabanuka.
- Ni ngombwa gukoresha mm 35 mu cyumweru ugitera kugera mu minsi 10 ikurikiraho, ugakoresha mm 50 mu cyumweru mu minsi ikurikiraho kugera mu gihe cy'urururabo.

✓ **Kubagara:**

- Ibyatsi bibi bigomba kurandurwa buri gihe kuko bicuranwa n'ibihingwa amazi n'ibitungakimera bigakorwa mbere y'uko ururabo ruza.



- Mu kubagara witondera kudahungabanya imizi y'igihingwa. Wirinda kubagara igihe imiteja y'ibishyimbo itangiye kuzana indabyo.
- ✓ **Gusukira:** Sukira ibihingwa uzamura agataka kugirango wirinde isazi y'ibishyimbo ifata ku ruti hasi. Ibi bikorwa imiteja ifite amababi 4.
- ✓ **Kongeraho Ire:** Nyuma y'ibyumweru 4 bateye: hakoreshwa garama 18 (udufuniko tubiri tw'icupa ry'amazi ya Nil twuzuye neza) kuri buri murongo wa m 10.

4. Gusarura no gufata neza umusaruro

- Imiteja migufi isarurwa mu byumweru 6-8 imaze guterwa igasarurwa inshuro 2 kugeza kuri 3.
- Imiteja ishingirwa itangira gusarurwa mu byumweru 8 imaze guterwa igasarurwa inshuro 3 kugeza kuri 5.
- Imiteja isarurwa ikiri uruteja kandi yoroshye itarera ngo ihwane Gutinda gusarura imiteja si byiza kuko bigabanya ubwiza bwayo ugasanga ifite imitsi myinshi.



- Gusoroma bigomba gukorwa mu gihe runaka gihoraho urebye kabiri cyangwa gatatu mu cyumweru, mu gitondo cya kare cyangwa nimugoroba cyane iyo hariho amafu kugira ngo idatakaza ubwiza bw'umusaruro.
- Imiteja isarurwa witonze inkondo zikaguma ku ruti.



- Gusarura mu bihe by'ubukonje n'imvura si byiza. Gusa iyo ikirere kidatanga umucyo, imiteja iramburwa ku gitambaro gisa neza kugira ngo yumuke mbere y'uko ipakirwa.
- Ikigereranyo cy'umusaruro ni kg 6,000 – 10,000 kuri Ha bitewe n'uko ibihingwa byafashwe.
- Imiteja yasaruwe ishyirwa mu gitete cya plastike gisukuye kandi gitwikiriwe n'igitambaro gisukuye



- Imiteja yasaruwe igomba gutoranywa (kujonjorwa) iyo yumutse ikanashyirwa mu makarito.




- Batoranya imiteja imeze neza idakomeretse itariwe n'udusimba kandi ifite umubyimba ugororotse wa mm6 kugeza kuri mm 9 n'uburebure bwa cm 10.
- Si byiza kuvanga imiteja n'ibindi bintu cyangwa n'izindi mbuto mu bubiko bumwe kuko bituma isaza vuba.
- Imiteja ishobora kubikika ahantu hari ubushyuhe buri hagati ya dogere 4 kugeza ku 7.5 n'ubuherehe bwa 95%-100% mu gihe kingana n'icyumweru kimwe kugeza ku byumweru bibiri.

5. Indwara n'ibyonnyi byingenzi by'imateja

| Indwara / Ibyonnyi | Ibimenyetso | Uburyo bwo kubirwanya |
|--|---|---|
| Tiripusi z'ururabo  | <ul style="list-style-type: none"> • Ubusimba bunyunyuzwa indabo bugatuma hazza inkovu no kubengerana kw'amababi. • Iyo ubusimba bubaye bwinshi butuma indabo zihunguka. • Imiteja irabengerana ikigonda ku buryo itakaza agaciro. | <ul style="list-style-type: none"> • Gutera imiti y'ubusimba kuva ibishyimbo bifite amababi 2 kugera bigeze mu rurabo birafasha cyane. • Imiti wasimburanya ni nka; <i>Lambda cyhalothrine</i>, <i>Alpha-cypermethrin</i> na <i>Deltamethrine</i> |
| Udutagangurirwa dutukura  | <ul style="list-style-type: none"> • Amababi arabengerana akagaragaraho indodo z'udutagangurirwa. • Ushishoje wabona udukoko duto dutukura tugenda muni y'amababi | <ul style="list-style-type: none"> • Randura ibyatsi bibi biri mumurima. • Gukora isimburana bihingwa ryiza nibindi bihingwa bitari ibinyamisogwe. • Gutera imiti nka Abamectin (<i>Avimeric</i>) na <i>Sulphur</i> |
| Urungo rw'ibishimbo  | <ul style="list-style-type: none"> • Ibishyimbo byafashwe bihinduka umuhondo, ku ruti ahagana ku butaka haba hasadutse. • Urungo rwinjira mu ruti rukarya igishyimbo kimaze kugondora cg kikiri mu butaka | <ul style="list-style-type: none"> • Gutera imbuto zihunguye n'umuti wa Imidachropride. • Gukora isimburana bihingwa ryiza n'ibindi bihingwa bitari ibinyamisogwe, kuhira (earthing-up) ibihingwa • Gutera imiti uyisimburanya nka: <i>Cypermethrine</i>, <i>Lambda cyhalothrine</i> na <i>Deltamethrin</i>. |
| Udusazi tw'umweru  | <ul style="list-style-type: none"> • Imiteja yatewe n'udusazi iragwingira igahinduka umuhondo, ikarabirana nyuma ikaba yakuma. | <ul style="list-style-type: none"> • Igihe udusazi tubaye twinshi, tera imiti uyisimburanya nka; <i>Cypermethrin</i>, <i>Lambda Cyhalothrin</i> na <i>Deltamethrin</i> |

| | | |
|---|---|---|
| <p>Ibinyabwoya by'imisogwe</p>  | <ul style="list-style-type: none"> • Ibinyabwoya byangiza indabo zigahunguka. Biruma imiteja bigakora umwenge bikinjira imbere. • Iyo myenge bisiga byinjira iba intandaro yo gutangira kubora. | <ul style="list-style-type: none"> • Kubona kare ibnyabwoya birafasha kubirwanya. • Irinde ikigunda hafi y'umurima • Tera ibigori na kokombure hafi y'umurima w'imateja bizakurura ibinyabwoya bibihugireho kuko bibikurura kurusha imiteja. • Koresha imiti nka Azadirachtin (<i>Nimembicidine</i>), <i>Lambda Cyhathrin</i> na <i>Deltamethrin</i> |
| <p>Umugese</p>  | <ul style="list-style-type: none"> • Utudomo tw'umugese tugaragara ku bice byo hejuru y'ubutaka ku miteja. • Utudomo dusa n'udutukura tumeze nk'udusohotse mu nsi y'ikibabi tuzengurutse n'ibara ry'umuhondo. • Amababi ashobora guhunguka yose. | <ul style="list-style-type: none"> • Koresha imbuto nziza zizewe kandi zihunguwe na Benlate. • Kora isimbura bihingwa neza. • Randura ibyafashwe cg birwaye cyane. • Tera umuti mbere yo kuzana ururabo nka <i>Azoxystrobin + Difenoconazole</i>, <i>Azoxystrobin</i>, <i>Chlorothalonil</i>. |
| <p>Virusi/ imfunyazi</p>  | <ul style="list-style-type: none"> • Indwara ikwirakwizwa n'inda. • Amababi arikunja akagira amabara y'umuhondo uvanze n'icyatsi kibisi. • Ibihingwa byafashwe bigira imiteja mito kandi yigonze. • Ishobora gukwirakwiza n'imbuto yanduye. | <ul style="list-style-type: none"> • Koresha imbuto nziza kandi yizewe. • Guhungiza imbuto umuti w'ubusimba nka <i>Imidaclopride</i>. • Randura ibishyimbo bigaragaye ho uburwayi. • Tera imiti uyinyuranya muri ubu bwoko: <i>Lambda Cyhalothrin</i>, <i>Alpha cyper</i>, <i>Abamectin</i> na <i>Azadirachtin (Nimbecidine)</i> igihe hari inda mu murima. |
| <p>Uruhumbu rw'umweru</p>  | <ul style="list-style-type: none"> • Uruhumbu rw'umweru rugaragara hejuru y'amababi. • Aho uruhumbu rufashe ku kibabi hahita hahinduka umutuku nyuma amababi yose yafashwe akaba umuhondo agahunguka. | <ul style="list-style-type: none"> • Hinga utabira ibisigazwa byose nyuma yo gusarura. • Simbuza neza ibihingwa wirinda gusubiza ibishyimbo aho bisaruwe. • Bagara kare ibyatsi bitarakura cyane. • Ushobora gukoresha imiti ubonye ibimenyetso nka : <i>Sulphur (Ramsulfa)</i> na <i>Difenoconazole</i> |

| | | |
|--|--|--|
| <p>Ibidomo by'ikigina</p>  | <ul style="list-style-type: none"> • Ibidomo bigaragara mbere ku mababi makuru. • Ibidomo ku mababi bigira ibara ry'ikigina, ahinduka umuhondo uko ibidomo bigenda biba byinshi, nyuma akuma agahunguka. • Imiteja ishobora gutangira kubora. | <ul style="list-style-type: none"> • Koresha imbuto nziza yizewe. • Hinga utabira ibisigazwa byose nyuma yo gusarura. • Simbuza neza ibihingwa tugarure ibishyimbo aho bisaruwe. • Guhungiza imbuto n'umuti wa Benlate • Ushobora gukoresha imiti ubonye ibimenyesho nka: <i>Difenoconazole, Carbendazim, Azoxystrobin. Mancozeb + copper, Chlorothalonil.</i> |
| <p>Kirabiranya</p>  | <ul style="list-style-type: none"> • Ibishimbo byafashwe biragwingira bikiri bito. • Amababi ahinduka umuhondo ahereye hasi nyuma igihingwa cyose kikuma. • Umuzi muremure uratukura naho indi yo mu mpande ikanga gukura. | <ul style="list-style-type: none"> • Kora isimbura bihingwa rinoze wirinda gutera ibishyimbo aho bivuye. • Kuvana ibisigazwa by'imyaka mu murima nyuma yo gusarura. • Irinde ikigunda mu murima. • Randura ibishyimbo byafashwe. • Tera imiteja mu butaka butareka amazi. • Koresha imbuto nziza kandi yizewe. • Tera imiti nka <i>Carbendazim, Defeconazole.</i> |

7.

UBUHINZI BW'IBITI BYERA IMBUTO

A. IMYEMBE



1. Amoko y'imyembe yamazwa mu Rwanda

- ✓ Mu Rwanda hari amoko agera kuri 16 ariko akunze kwamamazwa kubera ko yarangije gukorerwaho ubushakshatsi ni 6: Tommy Atkins, Kent, Bire, Kent luwero, Zillate na Apple Mango.
- ✓ Mu buhinzi bw'imyembe, ni ngombwa gukoresha imbuto zibanguriye kuko arizo zitanga umusaruro mwiza kandi utubutse mu gihe gito

2. Aho imyembe ikunda

- ✓ Umwembe ni igihingwa cyishima uduce dushyuha turangwa n'urunyurane rw'ibihe by'izuba n'imvura; yera neza aho ubushyuhe buri hagati ya dogere (°C) 20 na 26 n'ubutumburuke bwa 1200m.
- ✓ Aho imvura igwa ku kigereranyo kiri muni ya 700mm ku mwaka, uteganya kuvomerera. Kugirango imyembe ibashe kuzana ururabo n'imbuto nyinshi bisaba ko imara amezi atatu itabona amazi.
- ✓ Imyembe ikunda ubutaka bufite isi ndende, bwumutse kandi bworoshye, bufite ubusharire (pH) buri hagati ya 5.5 na 7.5.

3. Gutegura ingemwe zo gutera

- **Gutegura ingemwe zizabangurwa**
- ✓ Guhumbika bikorerwa mu butaka bwiza, buseseka, burimo ifumbire ihagije, kandi butari mu gishanga.

- ✓ Ibibuto biterwa ku mirongo byegeranye, bikarenzwaho agataka gake, bigatwikirizwa utwatsi duke hanyuma bikavomererwa kenshi igihe ari ngombwa.
- ✓ Ibibuto bimera mu byumweru bitatu igihe hatewe ikibuto bitonoye. Mu gihe hatewe ibibuto bidatonoye, bimera kugeza ku byumweru umunani. Gutera ibibuto bitonoye biba byiza cyane kuko haterwa ibyizewe ko ari bizima bidafite ibivumvuri imbere cyangwa nibe byaraboze.
- ✓ Hategurwa ibihoho bishyirwamo itaka ryiza rivanze n'ifumbire kandi bipfumaguye. Ibyo bihoho biba bifite cm 20 z'umurambararo na cm 20 z'uburebure (ibihoho birengeje uru rugero biba byiza nubwo byongera ikiguzi.
- ✓ Iyo ibibuto bimaze kumera, urandura buri kibuto bityo buri mumero ugashyirwa mu gihoho cyawo (umwembe igira imimeru irenze umwe); Umyembe ugemurwa igihe ufite umumero ufite cm 10-15.
- ✓ Ni byiza kuvomerera iyo imvura itagwa ndetse no gukuramo ibyatsi biba byamezemo.

Ubuhumbikiro bwubakwa hakurikijwe ibipimo bikurikira:

- ✓ Ubugari bw'umutabo: 1.20m-1.50m,
- ✓ Uburebure bw'umutabo: 10m-12m,
- ✓ Hagati y'umutabo n'undi: 80cm-1.00m,
- ✓ Ibiti byo gushinga bigomba kuba bifite 1.8m-2.00m,
- ✓ Ucukura umwobo wa cm 50 z'ubujyakuzimu,
- ✓ Ushingamo bya bitu ku buryo ubuhumbikiro buba bufite 1.30m-1.50m,
- ✓ Igomba kuba ifite ibiti, imbaho (cyangwa imbabari) ku mpande byo gutangira ibihoho,
- ✓ Igomba kuba kandi itwikiriye kugira ngo ugabanye izuba (iyo sakaro ntigomba kuba igizwe n'ibyatsi bimera cyangwa bifite imbuto zimera).

• Kubangurira

- ✓ Kubangurira bikorwa ku mezi 4 – 6 nyuma yo kugemurwa mubihoho, urugemwe ruba rufite cm 30 kugera kuri cm 40, rufite umubyimba ungana n'ikaramu.
- ✓ Hari uburyo bwinshi bwo kubangurira imyembe ariko ubukunze gukoreshwa ni uburyo bwo kubangurira ku mutwe, kuko ni bwo butanga ijanisha rinini mu gufata. Bikorwa bafata urugemwe babanguriraho bagakuraho umutwe bakatiye hagati y'ahoroshye n'ahakomeye, bagasatura ku mutwe hagati kugeza kuri cm 3-4. Nyuma y'aho babaza (kugegena) impande

zombi agashami ko kubanguriza (umubangurizo), bakakinjiza muri rwa rugemwe rwasatuwe, bagahambira n'agasashe gato ku buryo igikomere cyose gipfukwa. Iyi bikurikira no gupfuka ka gashami kabangurijwe hakoreshejwe ishashi ibonerana.

- ✓ Umubangurizo ukoreshejwe ni umutwe cyangwa ishami by'igiti cy'umwembe w'ubwoko bwifuzwa (butanga umusaruro mwiza, mwinshi kandi buryoha). Uwo mubangurizo mwiza uba ifite amaso 3-4, ifite uburebure buri hagati ya cm 6-10.



Urugemwe rwo kubanguriraho



Gushaka aho gukatira umutwe



Gukata no gusatura ku mutwe



Agashami kabangurizwa gaconzwe



Agashami gacengejwe mu rugemwe



Guhambira n'isashe no gupfuka



• Kwita ku ngemwe nyuma yo kubangurira

- ✓ Nyuma y'ibyumweru bitatu umaze kubangurira, amababi yambere atangiye gupfundura, ishashi yatwikirijwe ka gashami ikurwaho.
- ✓ Ni ngombwa gukata buri gihe ibisambo bishibuka muni yaho igitsindiro gitereye ku rugemwe rwabanguriweho.
- ✓ Urugemwe rumaze guhindura amababi icyatsi cyibitsi nirwo rukwiriye guterwa mumurima; ruba rumaze amezi 2 -3 rubanguriye.
- ✓ Ishashi yahambiriye kugisebe igomba gukurwaho kimaze gukira kugira ngo itanyunyuzwa urugemwe uko rugenda rubyibuha.

4. Gutegura umurima no gutera

- ✓ Hinga umurima neza uvanemo urwiri.
- ✓ Ni ngombwa kubanza kugaragaza mu murima ahazaterwa ibiti by'imyembe, hagingwa imambo.
- ✓ Cukura imyobo ya cm 60-100 impande na cm 60-100 ibujyakuzimu (ibi bipimo bigenda bihinduka bitewe n'ubwoko bw'ubutaka). Igitaka cyohejuru gishirwa uruhande rumwe aricyo gisubiramo kivanze n'ifumbire, ibyo

bigakorwa nibura icyumweru mbere yo gutera.

- ✓ Mu mwobo umwe hashyirwamo imborera ingana nibura n'ibase nigice
- ✓ Ku ngemwe zibanguriye, intera hagati y'igiti n'ikindi no hagat y'imirongo iba m 5 iyo nta yindi myaka iteganya guterwamo cyangwa se m 6 kugeza kuri m 7 iyo uteganya guhingamo indi myaka.
- ✓ Imyembe iterwa mu ntangiriro y'imvura kuva muri Nzeri kugeza mu Ugushyingo.
- ✓ Mu gutera igihoho kivanwaho hagasigara igitaka gikikije imizi kugirango ingemwe zifate neza.

5. Imirimo y'ingenzi yo kwita ku gihingwa

- **Kubagara, Gusasira, Kuvomerera:** Iyo imwembe imaze guterwa ni ngombwa kuwufata neza, uwubagarira. Biba byiza iyo bahingamo ibihingwa bitwikira ubutaka nka desmodium. Ni ngombwa kuvomerera igihe ibiti bikiri bito mugiyeye cy'izuba.
- **Gukata**
 - ✓ Iyo umubangurizo wakoreshewe mu kubangurira umaze gukura ku buryo ureshya na cm 40 umuhinzi awuca umutwe. Icyo gihe wa mubangurizo ushibuka amashami 3-5 yageza kuri cm 40 nayo agacibwa imitwe kugirango ashibuke andi mato nayo yamara kureshya na cm 40 akongera agacibwa imitwe. Ibyo birakomeza kugeza umwembe umaze kureshya na m 2 aho amashami agenda ashibuka ubwayo.
 - ✓ Mu rwego rwo gufata neza igiti cy'umwembe, umuhinzi akuraho ibisambo, amashami agoramye n'ayumye ndetse nafite uburwayi butandukanye. Iri kata kandi rigabanya amashami kugira ngo urumuri rubone uko rwinjira neza mu bice byose by'igiti.
- **Gushyira ifumbire mvaruganda ku biti**





Ingano y'ifumbire mvaruganda ikoreshwa ku giti kimwe cy'umwembe ku mwaka (garama)

| Umwaka | NPK (17-17-17) | Ire (46-0-0) | KCI (0-0-60) |
|----------------|-------------------|-----------------|-----------------|
| 1 | 147 | 98 | 292 |
| 2 - 3 | 294 | 196 | 250 |
| 4 - 5 | 441 | 293 | 292 |
| 6 - 7 | 588 | 391 | 458 |
| 8 - 9 | 735 | 489 | 625 |
| 10 no gukomeza | 882 | 587 | 792 |

6. Gusarura no gufata neza umusaruro

- ✓ Umusaruro wa mbere utangira kuboneka nyuma y’imyaka itatu igiti gitewe, ariko umusaruro ugenda uzamuka buri myaka, ku mwaka wa gatanu, imbuto zera ku giti zibarirwa hagati ya 200 kugeza kuri 500 ku mwaka, bitewe n’ubwoko.
- ✓ Umusaruro ushobora kugera kuri T 50-80/ha. Bitewe n’ukuntu umyembe wafashwe mu murima, cyane uwukata amashami, ushobora kwera kabiri mu myaka, hagati ya Nyakanga na Kanama no hagati y’Ukuboza na Gashyantare.

7. Indwara n’ibyonnyi by’ingenzi by’imyembe

| Indwara | Ibimenyetso | Uko bayirinda | Uko bayirwanya | Ibipimo muri 20L z’amazi |
|---|---|--|--|--|
| <p>1. AKARIBATA (ANTRACH-NOSE)</p>   <p>Akaribata ku mbuto</p>   <p>Akaribata ku mashami no ku mababi</p> | <ul style="list-style-type: none"> • Iyi ndwara itera ibidomo/ kubabuka ku mababi, kuma kw’imitwe y’ibishibu, kubabuka kw’ururabo no kubora kw’imbuto. • Ibidomo bigaragara mwibara ry’ikigina kumababi no kumashami aho amababi mato ariyo yibasirwa n’uburwayi cyane • Ku rurabo, utudomo duto tw’umukara tugenda twiyongera kugeza duhuye tukica ururabo rugahubguka. • Ku mbuto, iyi ndwara irangwa n’ibidomo by’umukara byinjije mu gishishwa bishobora gukira bigasiga inkovu. Iyo nkovu ishobora kuba intangiriro yo gusaduka K’urubuto igihe ubutaka bwabonye amazi menshi. | <ul style="list-style-type: none"> • Gutera ingemwe zitarwaye • Gukonorera/gukata ibiti by’imyembe buri gihe nyuma yo gusarura, • Gutera ubwoko bw’imyembe yihanganira ubu burwayi nka Tommy Atkins, Kent • Kwirinda gutera imyembe uyegeranije cyane, kuko bikururura ubuhehere bwinshi | <p>Gutera imiti nka Carbendazim (Rodazim), Copper hydroxide, Copper oxychloride, na Chlorothalonil uyisimburanya.</p> <p>Ni byiza gutangira gutera imiti igihe ururabo rwenda kuza, mu gihe hashibuka udushami duto, igihe cy’ururabo, kugeza igihe imbuto ziba zikuze</p> | <p>Carbendazim (20-25ml), Copper hydroxide / oxychlorid (40-60g), chlorothalonil (30-40ml)</p> |

| | | | | |
|--|--|--|---|---|
| <p>2. Indwara y'uruhumbu rw'umweru (powdery mildew)</p>  <p>Uruhumbu rw'umweru ku mababi no ku rurabo</p>  <p>Uburwayi ku mbuto</p> | <ul style="list-style-type: none"> • Iyi ndwara irangwa n'uruhumbu rw'umweru ku mababi, indabo n'imbuto zikiri n'toya. • Indabo zafashwe zirahunguka, • Amababi mato niyo yibasirwa n'uruhumbu rw'umweru cyane munsu y'amababi, • Imbuto n'toya zafashwe n'uruhumbu zirahanga zigahunguka, • Ku mbuto nkuru, igishishwa kirangirika kigasaduka mugihe ubutaka bufite amazi menshi. | <ul style="list-style-type: none"> • Gukonorera ibiti by'imyembe buri gihe kugirango hinjiremo urumuri, • Kuvanaho amashami n'amababi arashye agatwikwa cyangwa agatabwa, • Gutera ubwoko bw'imyembe yihanganira ubu burwayi nka Tommy Atkins, Kent, Bire, • Kwirinda kuvanga amoko y'imyembe arwara cyane (nka Bolibo, apple mango), | <ul style="list-style-type: none"> • Gutera imiti irimo sufure (Thiovit/Thiogil), uyisimburanya, Chlorothalonil na Copper hydroxide/ oxychloride, • Gutera umuti bitangira igihe harimo gushibuka amababi mashya mbere yo kurabya, bigakomeza mu gihe cy'ururabo. | <p>Thiovit (50-60g), Chlorothalonil (30-40g) na Copper hydroxide/ oxychloride (40-60g)</p> |
| <p>3. ISAZI (FRUIT FLY)</p>  <p>Isazi nkuru</p>  <p>Inyo ziri gusohoka murubuto</p>  <p>Urubuto rw'umwembe rwangijwe n'inyo.</p> | <p>Isazi zo mu bwoko bwa <i>Bacterocera</i> na <i>Ceratitis spp</i> zitera amagi mu gishishwa cy'urubuto, ariyo avamo inyo zangiza imbuto zenda guhisha,</p> <p>Ibi bituma habaho amarira ku rubuto asohoka aho isazi yakomereyeje itera amagi, hakaba hagaragazwa n'ibara ry'ibihogo cyangwa umutuku.</p> <p>Ya magi yatewe yituragamo inyo imbere mu mubiri w'urubuto maze izo nyo zigatangira kujya mo imbere mu gihe urubuto ruba rukigaragara nk'aho ari ruzima inyuma.</p> <p>Iyo urubuto rukaswe, ubasha kubona utuyira twijimye mu mubiri w'urubuto n'inyo zitemberamo.</p> <p>Imbuto zafashwe ziguma ku giti ariko zibora nyuma zikagwa hasi.</p> <p>Amasazi yangiza izi mbuto asa nk'utuvubi duto dufite amabara y'umuhondo n'ikigina.</p> | <ul style="list-style-type: none"> • Gusarura imbuto mbere yo guhishiriza ku giti, • Gutoragura imbuto zahungutse ku git buri cyumweru zigatabwa, • Guhinga ubutaka bwo hejuru (cm 5-10) mu murima w'imyembe mu mezi ya Nyakanga-Nzeri na Mutarama-Gashyantare bituma ibyana by'isazi biri mu butaka biya hejuru bityo bikaribwa n'ibindi bisimba cyangwa bikicwa n'izuba, • Gukoresha imitego ifata ayo masazi, igahora mu murima igihe cyose, • Hashyirwa imitego 10-12 kuri hegitare, imanitse ku bujeyuru bwa m 1-1.5 uvuye ku butaka kandi itandukanijwe na m 25 kuva mutego ujya kuwundi. |  <p>Umutego wabugenewe ushyirwamo umuti ukurura isazi n'umuti uziza,</p> <ul style="list-style-type: none"> • Gutera imiti nka acetameprid (Dudu acelamectin, lambda-cyhalothrin, deltamethrin, abamectin, ku mbuto guhera ku byumweru 6 mbere yo gusarura. Ni ngombwa kubahiriza igihe umuti umara mu murima mbere yo gusarura. | <p>Acetameprid (5-10ml), Lambdacyhalothrin (15-20ml), Deltamethrin (15-20ml), Abamectin (10ml).</p> |

**4. IKIVUMVURI
CY'URUBUTO
RW'UMWEMBE**



**Ikivumvuri ku
mwembe**

Ikivumvuri ni agasimba kajya kumera nk'igishorobwa.. Ibivumvuri rero nibyo bitera amagi ku mbuto iyo zikiri ntoya cyane, noneho urunyo ruvuye muri yamagi rwinjira mu rubuto rukajya mu kibuto kitarazengurukwa n'igishishwa kibamo.

Kemanya ko ikivumvuri cyangije imbuto ntabwo wabimenya kugeza imbuto zikuze ziri guhisha aho gitobora umwenge kuva mukibuto zimaze gukura gato biragora kubimenya kuko bitagaragara inyuma ku ruhu rw'urubuto. Iyo kimaze gukura, kivamo ari uko imbuto ziguye hasi cyangwa se zimaze guhisha kihakaca umwenge

- Ibimeneyetso bw'iki cyonnyi bigaraga cyane imbere mu rubuto aho gikurira kuva ku runnyo kugeza kibaye ikivumvuri.

- Guhinga buri gihe ahazengurutse ibiti nyuma yo gusarura, kugirango ibi byonnyi biri mu butaka bijye hejuru aho ibindi bisimba bibibona bikabirya.
- Gukusanya buri cyumweru imbuto zose zaguye, ukazitaba kure (muri cm 50 z'ubujyakuzima).

Gutera imiti nka acetameprid, Aster extrim) usimburanya na lambda cyhalothrin mu gihe cyo kuzana ururabo, ugatera byibuze inshuro ebyiri ku ntera y'iminsi 15..

Acetameprid (5-10ml), Lambdacyhalothrin (15-20ml), Deltamethrin (15-20ml), Abamectin (10ml).

B. AVOKA



1. Amoko y'avoka yamamazwa mu Rwanda

Ubu hari amoko 34 y'avoka; ariko ashobora kwera ahantu hose ni atatu: Hass, Fuerte na Ettinger.

2. Aho avoka zikunda

Avoka ihingwa ahantu hari ubutaka bufite isi ndende, buhitisha umwuka, bufite ifumbire ihagije, bufata amazi ariko ntarekemo, kuko yatuma imizi ibora bityo igiti kikuma. Ubusharire (pH) buri hagati ya 5.5-6.5, ubutumburuke bugera kuri 2500m, ibi bikaba bigaragaza ukuntu avoka ishobora kwera ahantu henshi hatandukanye. Ikunda ahantu hagwa imvura iringaniye (mm 1250 - 1750) mu mwaka, ariko ntigomba kuba muni ya 750mm. Kugira ngo ikure neza kandi itange umusaruro uhagije, ubushyuhe bukenewe ni dogere za selesiyusi 16-30.

3. Gutegura ingemwe zo gutera

- ✓ Habanza gutoranya ibiti bifite avoka zeze neza kandi zidafite indwara. Ibibitu bikurwa muri avoka zihanuwe ku biti: si byiza gukoresha ibibuto byatoraguwe kuko biba bifite uburwayi.
- ✓ Guhumbika bikorerwa mu butaka bwiza, buseseka, burimo ifumbire ihagije, kandi butari mu gishanga.

- ✓ Ubuhumbikiro burubakirwa, bugasakarwa, bagatera ibibuto mu mirongo.
- ✓ Umurongo n'undi itandukanwa na cm10, mu murongo ibibuto biba byegeranye, utwikirizaho agataka gake n'utwatsi duke hanyuma bikavomererwa kenshimigihe cyose imvura itagwa.
- ✓ Nyuma y'ukwezi n'igice kugeza kuri abiri, ibibuto biri mu buhumbikiro biba bimaze kumera. icyo gihe umumero uba ureshya na cm 5-10 kandi uba ugifashe ku bibuto. Urandura ikibuto cyameze, ugakata umuzi kuri cm 3-5 uvuye ku kibuto kugirango izamereho indi mizi, ukagishyira mu gihoho cya plastiki gipfumaguye cyuzuye igitaka rivanze n'ifumbire.
- ✓ Bakoresha ibihoho bya cm20xcm20, kuko bifata umwanya muto muri pepiniyeri kandi bikagabanya akazi. Ibihoho biterekwa ku murongo, muri pepiniyeri itwikiriye. Ingemwe zitabwaho, uvomerera iyo imvura itaguye.

Ubuhumbikiro bwubakwa hakurikijwe ibipimo bikurikira:

- ✓ Ubugari bw'umutabo: 1.20m-1.50m,
- ✓ Uburebure bw'umutabo: 10m-12m,
- ✓ Hagati y'umutabo n'undi: 80cm-1.00m,
- ✓ Ibiti byo gushinga bigomba kuba bifite 1.8m-2.00m,
- ✓ Ucukura umwobo wa cm 50 z'ubujyakuzimu,
- ✓ Ushingamo bya biti ku buryo ubuhumbikiro buba bufite 1.30m-1.50m,
- ✓ Igomba kuba ifite ibiti, imbaho (cyangwa imbabari) ku mpande byo gutangira ibihoho,
- ✓ Igomba kuba kandi itwikiriye kugira ngo ugabanye izuba (iyo sakaro ntigomba kuba igizwe n'ibyatsi bimera cyangwa bifite imbuto zimera).

- **Kubangurira**

- ✓ Kubanguria bikorwa ku mezi 2 –3 nyuma yo kugemurwa mubihoho, urugemwe ruba rufite cm 20 kugera kuri cm 30, rufite umubyimba ungana n'ikaramu.
- ✓ Hari uburyo bwinshi bwo kubangurira imyembe ariko ubukunze gukoreshwa ni uburyo bwo kubangurira ku mutwe, kuko ni bwo butanga ijanisha rinini mu gufata. Bikorwa bafata urugemwe babanguriraho bagakuraho umutwe bakatiye hagati y'ahoroshye n'ahakomeye, bagasatura ku mutwe hagati kugeza kuri cm 3-4. Nyuma y'aho babaza (kugegena) impande zombi agashami ko kubanguriza (umubangurizo), bakakinjiza muri rwa rugemwe rwasatuwe, bagahambira n'agasashe gato kuburyo igikomere cyose gipfukwa. Iyi bikurikirwa no gupfuka ka gashami kabangurijwe hakoreshejwe ishashi ibonerana.

- ✓ Umubangurizo ukoreshwa ni umutwe cyangwa ishami by'igiti cy'avoka y'ubwoko bwifuzwa (butanga umusaruro mwiza, mwinshi kandi buryoha). Uwo mubangurizo mwiza uba ifite amaso 3-4, ifite uburebure buri hagati ya cm 6-10.

- **Kwita ku ngemwe nyuma yo kubangurira**

- ✓ Nyuma y'ibyumweru bitatu umaze kubangurira, amababi yambere atangiye gupfundura, ishashi yatwikirijwe ka gashami ikurwaho.
- ✓ Ni ngombwa gukata buri gihe ibisambo bishibuka muni yaho igitsindiro gitereye ku rugemwe rwabanguriweho.
- ✓ Urugemwe rumaze guhindura amababi icyatsi cyibitsi nirwo rukwiriye guterwa mumurima; ruba rumaze amezi 2-3 rubanguriye.
- ✓ Ishashi yahambiriye kugisebe igomba gukurwaho kimaze gukira kugira ngo itanyunyuzwa urugyemwe uko rugenda rubyibuha.

4. Gutegura umurima no gutera

- ✓ Hinga umurima neza uvanemo urwiri.
- ✓ Ni ngombwa kubanza kugaragaza mu murima ahazaterwa ibiti by'avoka, hagashingwa imambo.
- ✓ Cukura imyobo ya cm 60-100 impande na cm 60-100 ibujyakuzimu (ibi bipimo bigenda bihinduka bitewe n'ubwoko bw'ubutaka). Igitaka cyohejuru gishirwa uruhande rumwe aricyo gisubiramo kivanze n'ifumbire, ibyo bigakorwa nibura icyumweru mbere yo gutera.
- ✓ Mu mwobo umwe hashyirwamo imborera ingana nibura n'ibase nigice
- ✓ Ku ngemwe zibanguriye, intera hagati y'igiti n'ikindi no hagati y'imirongo iba m 5 iyo nta yindi myaka iteganya guterwamo cyangwa se m 6 kugeza kuri m 7 iyo uteganya guhingamo indi myaka.
- ✓ Avoka ziterwa mu ntangiriro y'imvura kuva muri Nzeri kugeza mu Ugushyingo.
- ✓ Mu gutera igihoho kivanwaho hagasigara igitaka gikikije imizi kugirango ingemwe zifate neza.

| Ingano y'ifumbire mvaruganda ikoreshwa kugiti kimwe cy'avoka ku mwaka (garama) | | | |
|--|----------------|---------------|--------------|
| Umwaka | NPK (17-17-17) | Urea(46-0- 0) | KCl (0-0-60) |
| 1 | 133 | 42 | 87 |
| 2 | 266 | 84 | 175 |
| 3 | 399 | 127 | 304 |
| 4 - 5 | 598 | 144 | 331 |
| 6 - 7 | 798 | 192 | 441 |
| 8 - 9 | 997 | 240 | 551 |
| 10 - 12 | 1,196 | 288 | 661 |
| Nyuma yaho | 1.196 | 471 | 911 |

ICYICIRO CYA 3: GUFUMBIRA3

- Gushyira ifumbire n'itaka mu mwobo ku buryo bukurikira: habanza ifumbire mu mwobo kugeza kuri cm 30 z'ubuhagarike, hagakurikiraho itaka izindi cm 30 z'ubuhagarike, hakongerwamo ifumbire kuri cm 20 z'ubuhagarike, hagasozwa itaka ryiza kuri cm zisigaye 20. Ubundi buryo bushobora gukoreshwa ni ukuvanga ifumbire n'itaka mbere yo kurisubiza mu mwobo, ushyiramo ibiro 50 kugera kuri 70 by'ifumbire y'imborera. Ibi biba bigomba gukorwa nibura ibyumweru bibiri mbere yo gutera.
- Ibiti by'imbutu ziribwa bikenera ifumbire, cyane cyane ifumbire y'imborera; dushyiraho ibiro 50 kugera ku biro 70 ku giti buri mwaka; tugashyiraho amagarama 500 ya NPK 17³ ku giti ku mwaka. Kuva ku mwaka wa gatatu kuzamura hashyirwaho amagarama 1000 ya NPK 17³ ku mwaka.

ICYICIRO CYA 4: GUTERA IMBUTO

Igihe kiza cyo gutera avoka ni mu muhindo hagati y'Ukwakira n'Ukubozza. Ingemwe zibanguriye ziterwa zimaze igihe cyiri hagati y'amezi 8 na 10 muri pepiniyeri. Icyo gihe ziba zimaze gufata neza.

- Gufata urugemwe rwawe, ugakuraho igihoho, urandura urumambo rushinze mu mwobo, ucukura akobo ka cm30 ugaterekamo rwa rugemwe rwawe warangiza ugasibanganya neza

ICYICIRO CYA 5: GUFATA NEZA AVOKA MU MURIMA / KUBIKENURA

Mu rwego rwo gufata neza igiti cy'avoka kibanguriye, umuhinzi akuraho ibisambo, amashami ashaje, ayumye, ayavunitse n'ari hasi cyane; uku gukata bikorwa nyuma yoku gusarura.

Gusazura(Bikorwa iyo igiti kimaze gusaza, umusaruro utangiye kugabanuka; bakatira kuri cm 25 baturutse aho babanguririyeyi, igiti kikongera kigashibuka) .

Indwaraz'ibanze n'ibyonnyi bya Avoka n'uburyo bwo kuzirwanya

| Indwara / Ibyonnyi | Ibimenyetso | Wayirwanya ute? | Ibipimo by'umuti bikoreshwa |
|------------------------------------|---|--|-----------------------------|
| Kubora kw'imizi (Avocado root rot) | Mu butaka burekamo amazi, avoka ishobora gufatwa n'ako gahumyo, ku myaka iyo ariyo yose igiti cyaba gifite. Ibiti byafashwe bitangira gutakaza ubuzima, bigahunguka amababi kandi ntibigire umusaruro bitanga. Amababi ahindura ibara akeruruka kandi akaraba, amashami agenda asa n'ababurwa n'izuba akagenda yuma buhoro buhoro. Imizi igenda ihinduka umukara ikabora, hanyuma igiti kikuma imburagihe | gutera ahantu hatareka amazi, gukoresha imiti yica uduhumyo nka Oxychlorure/ hydroxide de cuivre, Ridomil, Daconil | |

Antarakinose
(Akaribata)



Iyi ndwara iterwa n'agahumyo kitwa *colletotricum gloeosporioides*. Amababi niyo akunze kugaragaza ibimenyetso aho usanga hazaho ibibara by'ibihogo, nyuma agahunguka, igiti kigasigara kimeze nk'icyakokotse. Iyo igiti cyafashwe bikabije, imbuto zikiri nto zirahunguka. Iyo imbuto zifashwe zimaze gukura, ako gahumyo kagumamo kihishe kugeza igihe urubuto ruzahira. Ni indwara iza na nyuma yo gusarura.



Ubu burwayi bugaragazwa n'ibidomo byinjyemo kandi hagasa n'ahaboze, ubwo bubore bushobora no kwinjiramo cyane imbere mu gice kiribwa cya avoka. Ako gahumyo gakunda kwibera ku bisambo, imbuto zaguye zikabora cyangwa se ibibabi byaguye.

- Iyi ndwara ikwirakwira cyane mu gihe cy'imvura,
- Gutera imbuto zifite agahumyo gatera iyi ndwara,
- Kubangurira avoka bakoresheje udushami dufite iyi ndwara
- Gukora isuku mu murima, kugabanya amashami no gukuraho ibisambo ku giti kugirango urumuri rwinjiremo neza,
- Kuvanaho imbuto zaguye
- Gukoresha ingemwe zitarwaye,
- Gutera imiti irwanya uduhumyo nka Copper oxychloride/hydroxide, carbendazim, chlorothalonil, Benomyl, Mancozeb, Metiram, Propineb, Thiabendazole cyangwa Triforine.

| | | | |
|-------------------------------------|--|---|--|
| <p>Amaga (Scab)</p> |  <p>Iyi ndwara iterwa n'agahumyo kitwa <i>sphaceloma perseeae</i>. Aka gahumyo gafata amababi akiri mato, ibisambo n'imbuto. Imbuto zafashwe zigira ibibara ku ruhu bimeze nk'uduheri cyangwa amagaragamba afite ibara ry'igihogo byerurutse bifite ishusho y'uruziga. Ku mababi usanga ariho byiganje cyane ku gice cyo hejuru cy'ikibabi kandi bikibanda ku mitsi y'ikibabi. Igishishwa cy'imbuto kirasatagurika, aho gisatuye hakabona. Ifata cyane ubwoko bufite igishishwa gito cyoroshye.</p> | <ul style="list-style-type: none"> • Gukora isuku mu murima, kugabanya amashami no gukuraho ibisambo ku giti kugirango urumuri rwinjiremo neza, • Gukura mu murima imbuto za avoka zaguye hasi, • Gutera imiti irwanya uduhumyo nka Copper oxychloride/hydroxide, carbendazim cyangwa chlorothalonil. | |
| <p>Ibidomo bya serikosisporiose</p> |  <p>Iyi ndwara iterwa n'agahumyo kitwa <i>sphaceloma purpureae</i>. Iyi ndwara ni ikibazo ku bwiza bw'imbuto. Gukara kw'iyi ndwara kugenda gutandukana bitewe n'igihembwe cy'ihinga, kandi ishobora gutuma umusaruro ugabanuka kugeza kuri 60%. Aka gahumyo kayitera gakunze gufata ku mbuto ndetse n'amababi, imbuto zafashwe zigira ibibara bisa n'umuhondo cyangwa ibihogo ku ruhu rw'imbuto no ku mababi Nyuma ibyo bidomo bigenda bihinduka bijya kuba ibihogo byegera umutuku, bigakomera kandi bigasatagurika. Iyi ndwara ikwirakwira cyane mu gihe cy'imvura cyangwa hariho ubuhehere bw'inshi mu murima uteyemo avoka.</p> | <ul style="list-style-type: none"> • Gutera umuti nka Copper oxychloride/hydroxide, carbendazim cyangwa chlorothalonil mu gihe cy'irabya, mugihe cyo kuzana imbuto na nyuma y'isarura, • Gukura mu murima avoka zigushije kugirango zitaboreramo • Gukora isuku mu murima, kugabanya amashami no gukuraho ibisambo ku giti kugirango urumuri rwinjiremo neza | |

Tiripusi 5



Tiripusi zikuze zikunda gufata avoka ziya gusa n'ikigina kijimye cyangwa umukara, naho izikiri nto ziba ari umuhondo.

Izi tiripusi zikwirakwizwa n'ibikoresho by'umuhinzi ndetse n'imyambaro.

Akenshi tiripusi zangiza igihingwa mu gihe cy'izuba aho zitera amagi ku mababi avamo ibishorobwa birya amababi agasigara abonerana. Tiripusi ishobora gukwirakwiza virus yitwa tospovirus ituma amababi yeruruka hanyuma akuma. Tiripusi zikunze kugaragara ku mitwe y'udushami, mu rurabo no ku duteja.

- Kugenzura umurima ku buryo buhoraho,
- Kubagara umurima hakurwamo ibyatsi bibi,
- Gusiga intera ihagije hagati y'ibihingwa,
- Gukoresha imiti ikomoka ku bimera (Urugero: Urusenda, itabi, pyrethrum,...)
- Gutera imiti nka: UMEME (Lambdacyhalothrin), Imidachloprid (confidor), Aster extrim, cypermethrin, Rokat ,Cypermethrin...;

8.

UBUHINZI BW'IBIHINGWA NGENGABUKUNGU

A. IKAWA



Kawa isasiye neza

1. **Uturere tuberanye n'igihingwa cya kawa:** Mu Ntara zose z'u Rwanda no mu turere twose two mu gihugu. Intara zifite amakawa menshi ni Intara y'Iburengerazuba, y'Amajyepfo, n'iy'iburasirazuba. Uturere 6 dufite amakawa menshi ni Nyamasheke, Rutsiro, Rusizi, Gatsibo, Ngoma na Kirehe.
2. **Ubutaka:** Ikawa yera ku butaka bwiza, burebure, buhehereye kandi budakomeye cyane.
3. **Amoko yamamazwa :** Jackson 2/1257, BM 71, BM 139 na RABC 15
4. **Aho ingemwe za Kawa ziboneka:** Ingemwe za Kawa zitegurwa n'inganda zitunganya umusaruro wa Kawa (Coffee Washing Station) zigahabwa abahinzi muri zone bakoreramo.
5. **Gutegura ubuhumbikiro/Pepiniyeri**

Bahumbika imbuto mu kwezi k'Ukwakira n'Ugushyingo kandi kg 1 y'imbuto itanga ingemwe ziri hagati ya 2 500 na 3 000. Ubhumbikiro bushyirwa aho buzashoborakuvomererwa ku buryo bworoshye kandi bugatwikirwa. Ingemwe zigemurirwa mu bihoho (birimo itaka ryiza n'ifumbire) nyuma y'amezi 3 cg 4 , nyuma zikavomererwa buri gihe, zikamaramo amezi 8.



Ubuhumbikiro bwa Kawa

6. Gutegura umurima

Imirimo ikorwa mu gutegura umurima ni iyi ikurikira: guhinga, kurwanya isuri, gucukura imyobo ya cm 60 z’ubugari kuri cm 60 z’uburebure na cm 60 z’ubujyakuzimu.

7. Gutera ingemwe

Haterwa ingemwe 2 500 kuri Ha 1 hagakoreshwa ibipimo bya m 2 hagati yumurongo n’undi na m 2 hagati y’urugemwe n’urundi ku murongo 1. Batera kava mu kwezi k’Ukwakira n’Ugushyingo naho gusimbura ingemwe zapfuye bigakorwa muri Werurwe.



Pepiniyeri ya kawa

8. Gufata neza kawa mu mirima

Gufumbira:

Hari uburyo bukurikira bwo gufumbira kawa:

- Bashyira kg 15-20 z’ifumbire y’imborera iboze neza kuri buri giti, imvura

igitangira kugwa (Werurwe na Nzeri). Iyi fumbire y'imborera ninayo ikoreshwa mugutera ingemwe za kawa.

- Ikawa bayifumbiza gr 100 za **NPK 22.6.12+3S** (mu byiciro bibiri ku giti gikuze: imvura igitangira kugwa Werurwe na Nzeri).
- Mu butaka bushariye cyane, ni ngombwa ko umuhinzi ashiramo hagati ya garama 200-300 y'ishwagara ku giti buri myaka itatu bitewe n'ingano y'ubusharire
- Ishwagara iterwa mu gihe cy'izuba mu mezi ya Nyakanga na kanama
- Ni ngombwa kandi gutera mu gipimo cya kawa ibiti ndumburabutaka.

Kubagara no gusasira kawa

Ni ngombwa kubagara uvanamo ibyatsi, ubagaza intoke muni y'igiti kugirango udakomeretsa imizi ya kawa; Mu gusasira Kawa umuhinzi ashobora gukoresha isaso ibora nk'umukenke, Temeda, Terebusakumu, ibisigazwa by'ibihingwa akirinda kwegereza isaso igiti. Usasira utambitse isaso kugirango izafashe kurwanya isuri mu gipimo cyawe cya kawa. Mu gukoresha isaso itabora (mukuna, desimodiyumu), umuhinzi yirinda ko ibyatsi bikura bikabangamira kawa, akaba agomba kubikata igihe bikuze no kwirinda ko byegera igiti cya kawa

Gukata

Hari uburyo butatu bwo gukata kawa:

a. kugonda kawa: ikawa ziba zimaze amezi 10 zitewe hagamijwe kuzatereka amashami 3 kuri buri giti. Iryo kata baryita : **ikata ryo kurera.**

b. ikata ryongera umusaruro: Buri mwaka, amashami yo hasi atacyera, ayumye, asobekeranye n'ibisambo, ayo yose agomba gukatwa.

c. ikata ryo gusazura igipimo: bikorwa nyuma y'imyaka 5 cyangwa 7 kawa itanga umusaruro. Ku mwaka wa mbere batema ibiti 2 nyuma y'isarura (Nyakanga-Kanama), hagasigara kimwe; ku mwaka wa kabiri w'iryo kata, batema igiti cya 3 cyari gisigaye. Ibyo biti bitemwa bamaze kongera gutoranya ibishibu 3 byiza bifite cm 50.

d. Gusimbura kawa ishaje

Iyo igiti cya kawa kimaze imyaka 30 gisarurwa kiba gishaje, kirarandurwa hagaterwa igiti gishya cya kawa.

Igipimo cya kawa gishobora gusimbura mu gihe cy'imyaka ine umuhinzi asimbuza 25% by'ibiti afite kugirango akomeze abone umusaruro.

9. KURWANYA INDWARA N'IBYONNYI BYA KAWA

Ibyonnyi by'ingenzi:

- A. *Agasurira (Antestiopsis spp)* : Agasurira ni agasimba gafite amabara y'umuhondo, umukara n' umweru ku nda no ku mugongo, kakagira amahembe n'amaguru bijya kuba umuhondo. Iyo ako gasimba ukiciye ku rutoki karanuka. Agasurira gakunze kuba ahantu hihishe, nko mu mababi menshi, muni y'amababi no hagati y'imbuto nyinshi z'ikawa. Ako gasimba kandi gakunze gutera amagi muni y'ikibabi cya Kawa.

Uko agasurira kangiza:

- Agasurira konona kawa gashinga umugobora wako mu ruteja rukiri igitumbwe maze kakanyunyuzwa amazi bityo ntirushobora gukomera neza.
- Ibitumbwe byariwe n'agasurira bitakaza ubuziranenge bwabyo kuko bihinduka ibihuhwe, ibi bikagaragara iyo bigeze mu nganda aho babitunganyiriza
- Uretse uruteja, udusurira twangiza amababi akiri mato, imitwe y'amashami n'ururabyo. Ibyo na byo bituma kawa ikura nabi igiti kikazana amababi akonjamywe kandi akaba menshi kandi mabi, ururabyo rukaba ruke n'utubuto tujeho, utwo dusimba tukaturya maze umusaruro ukagabanuka.



Agasurira



Amagi y'agasurira

Uburyo bwo kurwanya agasurira

Gufata neza umurima

- Gukata kawa kugirango urumuri rwiyoungere mu giti, agasurira kabure aho kihisha, kandi bitume imiti ikwirakwira neza mu mashami.
- Gutoragura udusurira n'amagi yatwo bikicirwa kure y'umurima
- Kwirinda kwica udusimba turya agasurira mu mirima (inchuti z'abahinzi), nk'uruvu, amavubi, urutambara)

Gutera imiti

Mbere yo gutera umuti uwo ari wose, umuhinzi asabwa kubanza kugisha inama ababishinzwe (abagaronome) kuko imiti yica agasurira igenda isimburana.

Imiti irigukukoreshwa:

- Alphacypermethrin 100 EC: Uwo muti ugomba guterwa ku gihe mu mezi y'Ukwakira/Ugushyingo kandi hamwe. Bavanga ml 4.5 z'umuti na litiro 15 z'amazi maze iyo mvange igaterwa ku biti hagati ya 40 na 45.
- Pyrethrins (AgropyEWC Plus : Igihe ni kimwe n'igihe baterera alphacypermethrin. Bavanga ml 22.5 z'umuti na litiro 15 z'amazi maze iyo mvange igaterwa ku biti 40.

B. Imungu y'ibitumbwe bya Kawa (coffee berry borer)

Mu Rwanda, icyo cyonyi cyibasiye intara y'Iburengerazuba cyane cyane ku nkengero y'ikiyaga cya Kivu. Imungu ifite ibara ry'umukara, itera amagi mu bitumbwe yinjiriye ku mutwe w'igitumbwe cya kawa (apex). Inyo ziturazwe mu magi zitungwa n'igitumbwe hagasigara ibishishwa gusa (parchment). Imungu y'ikawa ituma umusaruro ugabanuka kandi ugatazuka ubwiza bwawo bityo bigahombya umuhinzi.



Imungu ya kawa

Ibitumbwe byangirijwe n'imungu ya Kawa

Uburyo bwo kurwanya imungu ya Kawa

- Gusura umurima buri gihe ureba niba hari utwobo dutoya tw'umukara twiburungushuye turi ku mitwe y'ibitumbwe by'ikawa cg utuvumvuri dutoya tw'umukara turi mu twobo
- Gusoroma ibitumbwe byose byafashwe n'imungu bigacanirwa mu mazi hanyuma bigatabwa kure y'umurima kugirango uhagarike gukwirakwira kw'imungu z'ikawa
- Gusarura kawa zose z'imburagihe kugirango zidakomeza kuba indiri y'imungu mu murima wa Kawa

- Gutega imitego y'ibara ritukura mu bipimo bya Kawa irimo imvage y'ibikurura bihumura bigizwe na alukolo ya Metanolo na Etanolo kugirango imungu zifatirwemo
- Imiti yabugenewe yica udukoko iterwa mbere y'uko imungu yinjira mu gitumbwe

C. *Inkangabashi n' ibivumvuri (Stem borer): Igishorobwa*

Iki cyonnyi kigaragara mu Ntara zose z'u Rwanda kandi ibiti bishaje nibyo byibasiwe cyane n'igishorobwa

Inkangabashi y'umweru

- Yoroshye kuyibona, ifite ibara ry'umweru ku makote yayo.
- Itera amagi ku nsibo y'igiti cya kawa kitakorewe isuku, cyirihu inshankima, hagati y'iminsi 10-12 amagi yituragamo utunye twumweru tugatangira guharagata igishishwa cy'igiti tukinjira imbere mu giti.
- Iki gishorobwa cyangiza gihereye imbere mu nsibo y'igiti cya kawa, kikangiza imizi y'ikawa igiti kigahita cyuma. Urunyonyo (igishorobwa) kugirango ruhinduke inkangabashi bimara amezi 9-12, muri icyo gihe cyose rwangiza igiti cya kawa imbere mu ruti rukajya rusohora ifu imeze nk'ibarizo hanze ikagwa ku butaka. Iyo rwabaye inkangabashi, icukura umwobo wa cm 1 igasohoka igakomeza kuzunguruka mu gipimo cya kawa itera amagi.



Inkangabashi y'umuhondo:

- Yoroshye kuyibona, igira ibara rya orange (fanta ya orange), itera amagi ku giti cya kawa maze utunye tuvuyemo tukazamuka igiti dushakisha ahoroshye twakwinjirira. Twinjirira hejuru ku gashami kakiri gato koroshye gupfumura, kakarya igiti kamanuka mu ntimatima.

Ibimenyetso ku giti: utwobo duto cyane kandi twinshi tugaragara ku ruti rw'ikawa uva hejuru ujya hasi ku nsibo. Ifu imeze nk'ibarizo uyisanga hasi hafi y'igiti.



Igiti cya Kawa cyangijwe n'igishorobwa cy'umuhondo

Ikivumvuri: Gicukura umwobo ucuramye ku ruti rwa kawa hejuru ya cm 50 kikajyenda kizamuka mu ruti, iyo bicukuye bihungurira hasi ibisigazwa bimeze nk'ibarizo. Ku bindi bimenyetso, ibivumvuri kimwe n'inkangabashi zombi bituma amababi y'igiti aba umuhondo ndetse akagwa hasi uretse ko ibi bimenyetso bishobora no guterwa n'ibindi bibazo.



Kurwanya inkangabashi n'ibivumvuri (Stem borer)

Kubirwanya harimo akazi katoroshye ariko icyiza ni ugufata neza igiti kuko ibi byonyi bikunze kwibasira ibiti bishaje.

- Isuku ku giti : Gukura insharankima ku giti ukoresheje igikoresho cyidakomeretsa nk'imbagara, umufuka cyangwa umwenda ukomeye kugirango inkangabashi zibure aho zitera amagi.
- Gufumbira neza hakoreshejwe imborera n'imvaruganda bihagije kandi ku gihe byongerera ikawa imbaraga kandi bigatuma itangizwa cyane n'igishorobwa cy'ikawa
- Gusazura ibiti bishaje
- Gushyira ipamba mu muti wa Alphacypermetrin cyangwa Pyrethrins ugashyira mu mwobo wacunkuwe nako gakoko ukoresheje agati cyangwa urusinga.

INDWARA Z'INGENZI

- A. **Akaribata:** ni indwara iterwa n'udukoko duto cyane twitwa « *Colletotricum coffeanum* ».

Ibimenyetso:

- Imbuto zigaragaraho amabara ahombanye aho yafashe, zikagera n'ubwo zibora cyangwa zigahinduka umukara.
- Amababi y'igiti cyafashwe amera nk'ayababutse, ururabo n'intete bikumira ku giti ndetse rimwe na rimwe n'amashami akuma imitwe.
- Iyo ndwara yiyongera cyane mu bihe by'imvura.



Kwirinda no Kurwanya indwara y'Akaribata

- Gufata neza umurima wa Kawa kuzibagarira, kuzisasira, kuzifumbira no kuzikata ku gihe).
- Gutera umuti wa Oxylchlorure de cuivre inshuro 7 kugeza kuri 14 bitewe n'ubwinshi bw'imvura. Haterwa gr 140 bavanga na litiro 20 z'amazi batera ibiti hafi 25 bakagenda birenza iminsi 15. Batera umuti mu mezi ya Nzeli, Ukwakira, Ugushyingo, Ukuboza, Gashyantare (iyo imvura yatangiye kugwa) no muri Werurwe, Mata na Gicurasi (iyo imvura ikigwa).
- Gutera umuti wa Pyraclostrobin (Cabrio 250EC) : 6 ml/15 ml z'amazi ziterwa ku biti 40.

B. **Umugese:**

Iyo ndwara iterwa n'uduhumyo duto cyane bita *Hemileia vastatrix*.

Ibimenyetso :

Ku ruhande rwo hasi rw'amababi hazaho ifu y'umuhondo imeze nk'agakungugu gasa n'icunga rihye.

Ikunze kuboneka mu gihe cy'ubushyuhe, cyane cyane mu mpera z'itumba no mu ntangiriro z'impeshyi.



Kwirinda no Kurwanya indwara y'umugese

- Ni ngombwa gutera ubwoko bwihanganira indwara y'umugese nka RAB C15
- Gufata neza kawa mu murima (kuzibagarira, kuzisasira, kuzifumbira no kuzikata)
- Gutera ibiti bitannga igicucu mu murima wa Kawa
- Gutera umuti wa Oxylchlorure de cuivre: gr 70 bavanga na litiro 20 z'amazi bagatera ku biti hafi 25. batera 1 mu kwezi, batangira gutera mu kwezi kwa Nzeri, bagakomeza mu kwezi kwa Nzeri, bagakomeza mu Ukwakira, Ugushyingo, Ukuboza, Gashyantare, iyo imvura igwa Werurwe, Mata na Gicurasi.
- Gutera umuti wa Pyraclostrobin (Cabrio 250EC) : 6 ml/15 ml z'amazi ziterwa ku biti 40

C. Indwara ya Gikongoro (Dieback)

Indwara ya Gikongoro « Die-Back » iterwa n'umukeno. Ikunze gufata kawa ziteye ku butaka bubi, izidakoreye neza ndetse na Kawa itarabonye ifumbire ihagije.

Ibimenyetso



Uyibwirwa n'uko imbuto zihisha imburagihe (guhinduka umuhondo) maze zikirabura, zikumira ku giti. Amashami na yo arirabura akuma ahereye ku mitwe.

Kwirinda no kurwanya indwara ya Gikongoro (DieBack):

Ikawa igomba kurindwa umukeno hakorwa imirimo ikurikira:

- Gutera Kawa mu butaka bwiza
- Gukata Kawa igihe cyose aringombwa hakurwaho ibisambo n'andi mashami atagitanga umusaruro,
- Gufumbira cyane kandi buri gihe hakoreshwa ifumbire y'imborera n'invaruganda
- Kubagara no gusasira buri gihe

10. Gusarura Kawa

Kawa isarurwa ni ihishije neza, ifite ibara ritukura, kawa idahishije cyangwa yarengeranye yangiza ubwiza bwa kawa. Umuhinzi asoromera mu bikoresho bifite isuku agashyira mu mifuka ifite isuku kandi itaravuyemo ifumbire akagemura ku ruganda rutonora kawa mu gihe kitarenze amasaha umunani asoromye.



B. ICYAYI



1. Uturere tuberanye n'icyayi:

Mu Rwanda, icyayi gihingwa mu Ntara eshatu n'uturere 12 : Intara y'Amajyaruguru uturere twa Gicumbi, Rulindo na Burera, Intara y'Uburengerazuba uturere twa Ngororero, Nyabihu, Rubavu, Rutsiro, Karongi, Nyamasheke na Rusizi n'Intara y'Amajepfo, mu turere twa Nyaruguru na Nyamagabe.

Icyayi gihingwa ahantu hafite ubutumburuke buri hagati ya 1500 m na 2500 m, mu misozi ndetse no mu bishanga, ahantu hakonja (12°C - 22°C) kandi hagwa imvura ihagije ku mwaka (1500 mm-2000 mm) haboneka imirasire y'izuba nibura amasaha 5 ku munsu.

2. Ubutaka:

Icyayi gihingwa mu butaka busharira (pH iri hagati ya 4.5 na 5.5), burebure, butambutsa amazi kandi bufumbiye, ku buhaname butarengeje 60%

3. Amoko yamamazwa:

Ubu hari, 6/8, 31/8, 100/5, BB/10, 475, BB/35 BB/10, 12/56, 11/4, 303/577, 301/4, 301/5 n'ayandi.

4. UKO ICYAYI GIHINGWA KIKITABWAHO KUGEZA KU KUGEMURWA KU RUGANDA RUGITUNGANYA

- 4.1. **Gutegura pepiniyeri** : Ingeri (cuttings) zivamo ingemwe zikatwa ku mashami yakaswe mu murima wateretswe igihe cy'amezi 6-8, zikinikwa mu muti wabugenewe wica uduhumyo mbere yo kuzigemeka. Ingemwe zimara mu irerero igihe cy'amezi 10-12 ku ngemwe zizahingwa mu mirima mishya n'amezi 18 ku ngemwe zizahingwa mu mirima isanzwe ihinzemo icyayi, ziterwa ifumbire, zikabagarwa, ziterwa imiti mu gihe udukoko duteye, zikanamenyerezwa urumuri.



Umurima wateretswe kugirango utange ingeri

Pepiniyeri y'icyayi (irerero ry'ingemwe)

4.2. Gutegura umurima :

- Guca imirwanyasuri (imusozi), inzira, imihanda, imigende (mu bishanga), gutema ibihuru, kurimbura ibitsinsi neza nti hagire ibisigisigi byabyo bisigara, iyo bisigaye bishobora gutera icyayi indwara zimwe na zimwe.
- Guhinga bwa mbere barima (± 50 cm z'ubujyakuzimu) n'ubwa kabiri batabira kugirango ubutaka burekurane, buseseseke (loose).
- Gukuramo ibyatsi bibi byose, n'urwiri rwose.
- Gutera imambo aho icyayi kizaterwa hakurikijwe ibipimo by'uko bashaka ko icyayi kizaba cyegeranye ; hagati y'urugemwe n'urundi hateganywa cm 60 – cm 80 hagati y'umurongo n'undi hateganywa m 1.20 – m 1.40 bitewe n'ubuhaname

4.3. Gutera icyayi

- Aho buri rumambo rwashinzwe, hacukurwa imyobo ifite umurambararo wa ± 30 cm n'ubujyakuzimu bwa ± 60 cm (cyangwa 45 cm X 22.5 cm).
- Gutera gusa ingemwe zakuze neza zimeze neza.
- Ifumbire ya single superphosphate ivangwa n'ubutaka bushyirwa mu myobo icyayi giterwamo : haterwa ifumbire ya SSP ingana na g 54 mu mwobo wa 60 cm x 30 cm (cyangwa g 30 mu mwobo wa 45 cm X 22.5 cm).

- Gushyira urugemwe hagati mu mwobo isashe (tubing) igashyirwa ku mambo, gusubiza itaka (ryabanje kuvangwa n'ifumbire) mu mwobo.
- Gutsindagira neza
- Nyuma amasashe yose (tubing) barayakoranya akazajya muri recyclage
- Haterwa ingemwe 10,400 kugeza kuri 13,800 kuri Ha bitewe n'ubuhaname bagatera mu Ukwakira-Ukuboza iyo ari imusozi naho mu gishanga ni muri Gashyantare-Werurwe.

4.4. Guha icyayi ireme

- Icyayi kimaze amezi 6 gitewe kirakatwa cyangwa kikagondwa kugirango kigire ireme ku buryo kigara uherye hasi kikagira amashami ya mbere atambitse azazamukaho andi menshi akoze ameza y'icyayi umusoromyi asoroma bitamugoye.
- **Uburyo bwo gukata nibwo bukunzwe gukoreshwa**, Urugemwe rwatwe mu murima ruba rudafite amashami ; kugirango icyayi kizane amashami, kugikatira hagati ya 15 cm - 25 cm uturutse hasi hifashishijwe secator (decentrage) nyuma y'amezi nibura 6 gitewe, muni y'aho bakatiye haba hari nibura amababi 3 ; nyuma y'umwaka n'igice icyayi gitewe(amezi 18-20), amashami yacyo aba afite umurambararo nibura wa cm 1, icyayi gikatirwa kuri cm 25 uvuye hasi, ni ugukata bwa mbere gihabwa ireme (1st formative pruning), nyuma y'andi mezi 12-15, gugikata bwa kabiri bagiha ireme ku burebure bwa cm 40.
- **Nyuma y'ibyo hakurikiraho kugorora ameza** (tipping) kugirango icyayi kigire ameza aringaniye kandi ateganye (pararel) n'ubutaka. Nyuma y'amezi 3 bakuraho ishami ryose rifite amababi 3 n'umwumba hejuru ya cm 60 hifashishwa inkoni y'umusoromyi, tipping ikorwa nibura inshuro 3 kugirango icyayi kigire ameza aringaniye neza.

4.4. Gufata neza icyayi mu mirima

Imirimo umuhinzi agomba kwitaho ni iyi : kubagara, kugomorora amazi mu bishanga mu gihe cy'imvura no kuyagomera mu gihe cy'izuba, gusibura imirwanyasuri imusozi, gusasa amashami yakaswe iyo icyayi cyakaswe, gutera ibiti bihagarika umuyaga, gukata icyayi buri myaka ine uherye ku mwaka wa munani gitewe, gusimbura ingemwe zapfuye, kurwanya indwara n'ibyonnyi, gusoroma buri minsi 7-10, gutera ifumbire, n'ibindi.

4.5. Gutera ifumbire :

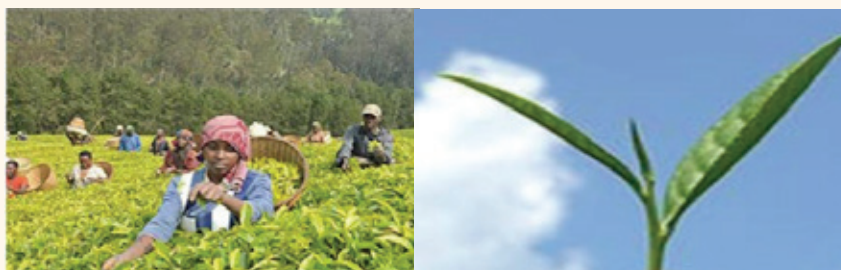
Ifumbire iterwa mu mirima ibagaye neza, yagomereye neza, iterwa mu kwezi kwa 3 no mu kwa 10, iterwa ku muzenguruko wa buri giti cyangwa bakamisha iyo icyayi cyamaze gufatana.

Haterwa ifumbire ya NPK 25-5-5, ariko ibipimo by'ubutaka n'amababi biramutse bigaragaje ko hakenewe indi fumbire itari iyo, niyo iterwa cyangwa ifumbire y'imborera ku bashaka icyayi kitarimo imvaruganda (organic tea).

Ingano y'ifumbire iterwa :

| Umwaka | Ingano y'ifumbire |
|------------------------|-------------------|
| Mu mwaka wa 1 | kg 240/ha |
| Mu mwaka wa 2 | kg 280/ha |
| Mu mwaka wa 3-5 | kg 320/ha |
| Mu mwaka wa 6-7 | kg 480/ha |
| Mu mwaka wa 8 kuzamura | Kg 600/ha |

4.6. Gusoroma icyayi



- Icyayi gisoromwa buri minsi 7-10 ariko ishobora kwiyongera mu gihe cy'izuba;
- Hasoromwa amababi 2 n'umwumba (P+2)
- Ambwiriza y'isoroma ryiza ku cyayi cyitwa Black CTC tea ari nacyo gikorwa cyane mu Rwanda ni aya akurikira:
 - Umwumba n'ibabi 1 : $P+1 \leq 4\%$
 - Umwumba n'amababi 2 : $P+2 \geq 50\%$
 - Umwumba n'amababi 3 : $P+3 \leq 17\%$ (irya 3 ryoroherewe)
 - Umwumba n'amababi 4 : $P+4 \leq 4\%$ (irya 3 n'irya 4 ryoroherewe).

1.1. Gutwara icyayi:

- Amababi y'icyayi yasoromwe agomba gufatwa neza nta kuyanyukanyuka no kuyapfanyarika mu ntoki, asoromerwa mu gitebo cyabugenewe kiba kiri



mu mugongo w'umusoromyi ntatsindagirwe kuko iyo atsindagiwe cyangwa anyukanyutswe arangirika agatangira gushya. Umusoromyi yihutira gutwara icyayi ku kirogotero gifite isuku (collection center) aho gipimirwa uburemere ndetse iyo gisoromye nabi arongerera akagitoranyamo ibisoromye nabi aribyo bita kurogota, iyo umusoromyi amaze gupimirwa icyayi yihutira kugisuka hasi akagisanza kugirango kidashyuhirana kigashya, imodoka zikihutira kuza kugipakira zikijyana ku ruganda rugitunganya.

- Imodoka zitwara icyayi zigomba kuba zifite isuku, zikaba zirimo ibitanda biterekwaho amakirete (cretes) apakiyemo icyayi kidatsindagiye gifite ubuhumekero cyangwa se zikabamo utwuma tumanikwaho imifuka (crochets) ipakiyemo icyayi kidatsindagiye gifite ubuhumekero.
- Imodoka zigomba kuza gutwara icyayi zidakorerewe, ababishinzwe bose bagomba gufatanya gupanga uko imodoka zijya gupakira byihuse, abazipakira n'abazipakurura n'aho zipakururirwa bigategurwa kugirango icyayi kidapfira mu birogotero cyangwa mu nzira cyangwa ku ruganda aho zitegerereza gupakururwa ngo icyayi gitunganywe.
- Imihanda (feeder roads) igomba kuba ikoze neza kugirango imodoka zitanainrwa kunyuramo icyayi kigakererwa kigapfa.


5. Indwara n'ibyonnyi bimwe na bimwe biboneka mu cyayi

Ntabwo icyayi gikunze kugira ikibazo cy'indwara n'ibyonnyi gihangayikishije ariko kandi bijya biboneka.

A. Indwara y'ububore (Armillaria root rot):

| | |
|---|--|
|  | <p>Iterwa n'agahumyo bita <i>Armillaria mellea</i> igafata mu mizi y'icyayi igatuma ibora.</p> |
|  | <p>Ibimenyetso byayo: Kugwingira mu mikurire, guhinduka umuhondo kw'amababi, Kurabya imburagihe, guhunguka kw'amababi, guturika k'uruti mu ntangiriro yarwo, uruhumbu rwera hagati mu busate n'imbere mu ruhu.</p> |
| | <p>Kuyirwanya: Kurandura no gutwika icyayi kigifatwa n'iyi ndwara, kwirinda gutera ibiti bishora imizi cyane aho ikunze kuboneka.</p> |
| | <p>Icyitonderwa:</p> <p>Iyo ibishyitsi by'amashyamba cyangwa ibyo ku mirwanyasuri bisigaye mu mirima bitaranduwe, bituma kenshi na kenshi indwara ikura igafata icyayi. Iyo ndwara iboneka cyane mu butaka buremereye kandi buhehereye.</p> |


B. Indwara y'ibidomo by'ibijuju:

| | |
|---|---|
|  | <p>Ikiyitera: <i>Pestalotia theae</i></p> <ul style="list-style-type: none"> • Ibimenyetso: - Ibizinga bya « grey » ku mababi akuze - Utudomo tw'umukara muri ibyo bizinga ku ruhande rwo hejuru rw'ikibabi • Uburyo bwo kuyirinda - Kudakora igicucu gikabije mu ma pepiniyeri - Kutarenza amazi akenewe mu gihe cyo kuvomerera imbuto muri pepiniyeri - Gutera ifumbire uko bigomba • Uburyo bwo kuyivura - Kugabanya igicucu - Kugabanya kuvomerera - Imiti ikoresheya : Dithane M45 (4-5gm/1 Lt y'amazi), Copper Oxchloride (5-7gm/1lt y'amazi), Benlate (1gm/1lt y'amazi). |
|---|---|


C. Inda z'icyayi

| | |
|--|--|
| <p>Red spide mite (<i>Oligonychus coffea</i>)</p>   | <ul style="list-style-type: none"> • Ni agakoko gato (mm 0,3) iyo gakuze kagira ibara ritukura. Ibyana n'udukuru bitungwa no konona icyayi dushinga umugobora watwo ku mababi ku gipande cyo munsu kandi iyo tumaze gukura tunyonyuza amazi bityo amababi yafashwe ahinduka ikigina kijya gutukura. • Uko kuma bikabona bituma amababi ashobora kuma no guhunguka. Ubwone bukunze kugaragara ku biti bimwe na bimwe mu mirima kandi bigakura cyane cyane mu gihe cy'impeshyi. <p>Kurwanya utwo dutagangurirwa:</p> <ul style="list-style-type: none"> • Iyo bidakabije, imvura irabivura • Gutera Abamectin 1.8 EC, Pyrethrum 5EW, Azadirachtin Indica <p>Icyitonderwa: Iyo mu kurwanya utwo dutagangurirwa hakoreshejwe umuti , icyayi gisoromwa nyuma y'iminsi 15.</p> |
| <p>Red crevice mite (<i>Brevipalpus phoenicis</i>)</p>   | <ul style="list-style-type: none"> • Ibara: Umutuku • Uko kingana: 0.5 mm • Ibimenyetso: <p>Amababi ahinduka ikigina ku ruhande rwayo rwo hasi Uko kiyongera amababi arahunguka</p> <ul style="list-style-type: none"> • Kukirwanya: <p>Gukata no gukura mu mirima ibiti birwaye</p> <ul style="list-style-type: none"> • Gutera umuti wabugenewe • Gutera Abamectin 1.8 EC, Pyrethrum 5EW, Azadirachtin Indica |


D. Imbaragasa z'icyayi (aphids)

| | |
|---|--|
|  | <p>Ibimenyetso</p> <ul style="list-style-type: none">• Imbaragasa nyinshi ziboneka mu mashami mato agishibuka muni y'ikibabi.• Amababi yafashwe arizingazinga byatinda agahinduka umukara. <p>Kuyirwanya</p> <ul style="list-style-type: none">• Gusoroma kenshi cg gusoromera hasi (hard plucking)• Gutera umuti uturuka muri Pyrethrin kuko udasaba gutegereza igihe kinini mbere yo kongera gusarura. |
|---|--|

E. Hypoxylon wood rot

| | |
|---|--|
|  | <p>Iterwa n'agahumyo bita Hypoxylon serpens.</p> <p>Ibimenyetso byayo : Kugabanuka kw'amashami ashibuka nyuma yo gukata, ibidomo by'umukara ku mashami yaboze/yapfuye/yumye.</p> <p>Kuyirwanya : Kurinda ko izuba rirasa ku nkovu z'igiti igihe cy'ikata, Gukata neza ku buryo amazi y'imvura atemba ku nkovu, kwirinda gukatira icyayi ku burebure bwo hasi, gukoresha ibikoresho byabugenewe mu gihe cyo gukata, kurenza amashami ku biti byakaswe mu gihe cy'izuba.</p> |
|---|--|

F. Igishorobwa (cockhafer grub)

| | |
|---|---|
|  | <p>Ibimenyetso</p> <ul style="list-style-type: none">• Amababi ahinduka umuhondo• Igiti cy'icyayi kiruma kigapfa• Iyo uranduye igiti kirwaye usanga imizi mito (feeder roots) yarariwe. <p>Uko kirwanywa:</p> <ul style="list-style-type: none">• Kubitoragura ariko ibyavuyemo bigatwikirwa kure y'umurima.• Mu gihe cyo guhinga kureba ko nta bishorobwa bito birimo bigakurwamo.• Gutera icyayi gikuze neza kandi kigahabwa ibikenewe byose (GAP). |
|---|---|

9.

UBWOROZI GAHUNDA YO GUTERA INTANGA MU NKA



Inyungu zo kubangurira Inka hakoreshewe intanga

- Kubangurira inka hakoreshewe intanga nibwo buryo bwizewe bwo kuvugurura icyororo bwongera umusaruro.
- Biroroshye kubona no gukoresha intanga z'imfizi nziza aho yaba iherereye hose kuko gutwara intanga biroroha kandi birahenduka ugereranije n'Imfizi.
- Imfizi zitanga intanga zitoranywa hagendewe ku makuru yanditse y'ubwiza bwazo, ubw'izazibyaye, izo byavukanye, ndetse n'izazikomotseho cyangwa hapinywe uturemangingo (ADN) twazo kuburyo umusaruro zizatanga uba wizewe.
- Gukoresha intanga bituma inka zitarwara indwara z'imyorokere,
Urugero: Kwirinda Amakore.
- Mu kubangurira hakoreshewe intanga, birashoboka gukoresha intanga zibyara Inyana gusa.
- Gukoresha intanga birahenduka kuko gutunga imfizi birahenda cyane.
- Gukoresha intanga birinda impanuka nyinshi zikunze kubaho mu gukoresha no gutunga imfizi.

Uko serivisi yo gutera intanga mu Inka iboneka

Umworozi ushaka kubangurira inka akoresheje intanga, ashobora kubona iyi serivisi abajije Umukozi ushinze ubworozi ku Murenge. Hari n'abatekinisiye bigenda mu Mirenge bahuguriwe gutera intanga. Ni ngombwa ko Umworozi abika numero y'Umukozi ushinze ubworozi mu Murenge cg Umutekinisiye utera intanga kugirango aje amugisha inama.

Ibimenyetso bigaragaza inka yarinze

- Kurira izindi, cyangwa g igihe indi iyuriye ikaguma hamwe, igatega nk'igiye kwima
- Kuzana izimwe
- Umukamo uragabanuka iyo yakamwaga
- Imera nk'irwaye kandi itarwaye
- Gusonza
- Kwabira
- Kwiruka imusozo nk'ifite icyo ishaka (imfizi)

Igihe uhamagara ushinze gutera intanga

Nkuko ubushakashatsi bwabyerekanye, iyo ibimenyetso byambere by'inca yarinze, byagaragaye, interwa intanga nyuma y'amasaha 12.

- Inca yarinze mu gitondo kare iterwa intanga nyuma ya saa sita.
- Inca yatangiye kurinda nimugoroba iterwa intanga mu gitondo.

Ni ngombwa cyane gukurikiranira hafi inca yawe, ukagenzura buri gihe ko igaragaza kimwe mubimenyetso byavuzwe haruguru, hanyuma ukihutira guhamagara utera intanga kandi ukamuha amakuru yose, ugasubiza uvugisha ukuri ibibazo utera intanga akubaza. Kunyuranya nibivugwa muri iki gika, bishobora gutuma inca yawe irinduka, yaterwa intanga ntifate.

Iyo inca yatewe intanga itafashe yongera kugaragaza ibimenyetso by'inca yarinze hagati y'iminsi 19 na 21.

Ubwoko bw' intanga ziri mu Rwanda

Hagendewe ku ntego y'umusaruro ukenewe, habaho inca zororerwa gutanga amata n'izororerwa gutanga inyama. Ubwoko bw'intanga ziboneka:

Ubworozi butanga amata:

- Frisone
- Jersey
- Brown Suisse
- Fleckvieh

Ubworozi butanga inyama:

- Sahiwal
- Fleckvieh

Kubika amakuru

Bika certificat yawe Umutekinisiye utera intanga agusigiye, kuko ubutaha izamufasha kubona andi makuru atuma arushaho kuguha service nziza. Uzibuke kandi

kumumenyesha ko wavukishije kugirango aze kubarura no kwambika iherena inyana yawe.



1. Ikiraro:

Ikiraro gituma umworozi yongera umusaruro ukomoka ku matungo nk'amata, inyama, ifumbire n'imirimo.

- Gukingira amatungo ibihe bibi biturutse ku kirere nk'ubushyuye, izuba n'ibindi
- Gucunga neza amatungo, kuyagaburira neza no kwita ku buvuzi bwayo
- Koroshya uburyo bwo gufata umusaruro w'ubworozi bw'inka: Amata n'ifumbire
- Kongera umusaruro uyaturukaho, gutanga ifumbire no kugabanya abakozi.

Uko ikiraro kigomba kungana



- Kuri buri nka, hagomba umwanya wa m 1,50 z'ubutambike, naho ubuhagarike bukangana n'uko inka ireshya, kuva ku mazuru kugera ku matako wongeraho cm 10 ari byo byangana na m 2-2.50.
- Ikiraro bororeramo kigomba kuba gisakaye, kandi gifite icyarire. iyo kitubakiye mu mpande, inka barazizirika.
- Ikimopoteri (ingarani) kiba kigizwe n'icyobo cy'ubugari bwa m 2,5, uburebure bukangana na m 2 ku nka ebyiri. Ubuajakuzimu buba bufite m 1, ibitaka bijugunywe iruhande bikora akantu k'agakingo. Inyuma haba hacuramyeye buhoro.

2. Kororoka

- Bitewe n'uko ari ubworozi busanzwe cyangwa ubwa kijyambere inka zima zigahita zifata ni 50% kugeza kuri 80%.
- inka yima ubwa mbere imaze amezi 24 ivutse iyo yorowe kijyambere cyangwa 36 iyo yorowe bisanzwe bya gihanga. Imfizi imwe iba ihagije kwimya inka 50. Hagati y'imbyaro 2, haca amezi 12 kugeza kuri 21 bitewe n'uko inka yorowe. Inka ivanwa mu bworozi imaze imyaka 10-13.
- Inka ihaka amezi 9, bahagarika kuyikama ishigaje amezi 2 ngo ibyare.
- Gutera intanga ni byiza kurusha kubangurira ku mfizi; mu moko y'inka zo mu mahanga dufite iwacu kandi dushobora kubangurira n'ubwoko bwacu bw'Ankole kugira ngo haboneke ibyimanyi byiza, twavuga nka Jersey. Brun-suisse, Sahiwal, Frisonne n'izindi.

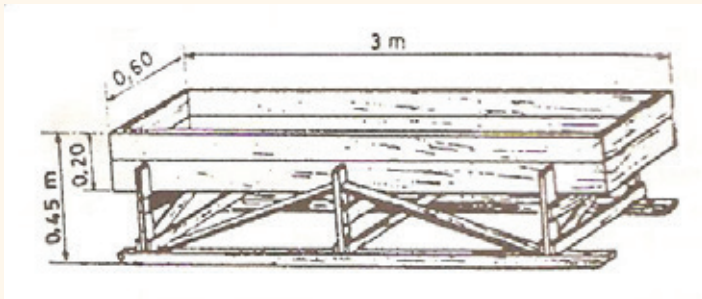
3. Kugaburira inka



- Aho inka zirira hagomba kuba hubatse ku buryo ibiryo byazo bidatakara zirimo kurya, kandi umuntu akaba yahashubiramo bitamugoye iyo bibaye ngombwa.
- Mu biraro bisanzwe by'abahinzi-borozi, uburiro bushobora gukorwa mu mbaho cyangwa ibiti.

Dore uko uburiro bugomba kungana :

- o ubugari cm 60-80
- o ubutambike bungana n'ubw'ikiraro
- o uburebure imbere cm 10-40
- o uburebure kuva hasi kugera aho zirira : cm 80
- o ubufukure : cm 20



Igaburo

- Inka zirya ibyatsi byo ku gasozi, ibyahingirwa amatungo, ibisigazwa bituruka ku musaruro w'ubuhinzi, cyangwa ibyo mu nganda
- Mu byatsi bihingirwa inka twavuga **“Tiribusakumu, setariya, urubingo, desmodiyumu, luzerine, Kariyandara, kororisi gayana, n'ibindi”**.
- Inka yororerwa mu kiraro isaba guhingirwa ari 30-40 z'ubwatsi ku mwaka. Hakurikijwe ko bwahinzwe mu kibaya cyangwa ku gasozi. Ni byiza ko mu igaburo ry'inka haba harimo imvange y'ibinyampeke n'ibinyamisogwe.
- Iyo bafumbira umurima w'ubwatsi bw'amatungo bashyiramo toni 10 z'ifumbire yo mu ngarani na kg 300 z'ifumbire mvaruganda kuri hegitari imwe.
- Kugira ngo baziteganyirize ibihe bibi, inka bazibikira ubwatsi bwumye (foin) cyangwa ubwahunitswe mu butaka (ensilage).
- Inka zikamwa n'izihaka hejuru y'amezi arindwi, ni byiza kongera ku igaburo ryazo risanzwe ibiryo mvaruganda. Iyo umukamo uri hejuru ya litiro 6, bayiha 0,5 kg cyabyo kuri buri litiro ziyongeraho. Buri nka igomba guhabwa igaburo yihariye cyangwa rusange.

Umusaruro

Bitewe n'uko yorowe bisanzwe cyangwa kijyambere, inka ya kinyarwanda ikamwa:

- Iminsi 180 (ubworozi busanzwe), igakamwa litiro 325 havuyeho ayo inyana yonka;
- Iminsi 300 (ubworozi bwa kijyambere), igakamwa litiro 2 280, inyana yonka amalitiro 350 y'amata;
- Inka ya kinyarwanda iyo ibazwe itanga umurumbuko wa 48-50% by'inyama.

Umusaruro w'izindi nka zororwa mu Rwanda

| | Sahiwal (Sayiwale) | Jersey (Jerise) | Brun Suisse | Firizone Holstein | Jersey Sahiwal Ankolé |
|-----------------------------|--------------------|-----------------|-------------|-------------------|-----------------------|
| Umukamo (litiro) | 2 300 | 2 500 | 4 000 | 5 000 | 3 757 |
| Igihe imara ikamwa (iminsi) | 359 | 330 | 330 | 305 | 333 |
| Umusaruro iyo ibazwe | 50% | 45% | 50% | 50% | 50% |

Indwara z'Inka

Indwara zikunze kuboneka cyane ni inzoka zo mu nda, iziterwa n'uburondwe nk'ikibagarira n'amashuya, naho indwara zandurwa twavuga ruhaha, uburenge, ubutaka, amakore, igituntu, kurwara amafumbi y'icebe.

Icyitonderwa: Mu bikorwa kugira ngo barengere ubuzima bw'inka hari ukuzikingira ubutaka ni igifuruto buri mwaka, kuzuhagiza umuti wica uburondwe byibura rimwe cyangwa kabiri mu cyumweru, no kuziha imiti y'inzoka kabiri mu mwaka. Inka nkuru buri amezi 6 mu giye inyana ifata umuti w'inzoka buri amezi 3.

Indwara z'inka n'uburyo bwo kuzirwanya

| Indwara | Ikigero cy'inka zifatwa | Ibimenyetso | Uko bayirwanya |
|----------------------------------|-------------------------|--|---|
| 1. Inzoka | Inyana, inka nkuru | - Kubyimba inda - Kudakura neza, guhitwa, kunanuka, gukorora, guhinduriza ubwoya | - Imiti y'inzoka nka Nilzan kabiri mu mwaka - Kororera mu kiraro |
| 2. Ikibagarira (igikira) | Inyana, inka nkuru | Kugira umuriro mwinshi 39.5-41 °C, kutarisha, kubyimba inturugunyu, guta urukonda, guhumeka nabi, kubyimba amaso | Gutera imiti y'uburondwe na decatif rimwe cyangwa kabiri mu cyumweru kuvurisha oxytétracycline na Butalex |
| 3. Umwumira (Anaplasmoze) | Inyana, inka nkuru | Kugira umuriro minshi, kutarisha, kunanuka cyane, amaso y'umuhondo | - Gutera imiti y'uburondwe - Kumisha oxytétracycline |
| 4. Amashuya/ Inkurikizi | Inyana, inka nkuru | Kugira umuriro mwinshi 39-40 kurisha nabi, kugira amaraso make, kunanuka bikabije | - Kurwanya isazi ya Tsétsé - Kuvurisha Samorin, Bérénil, Trypamidium |
| 5. Uburenge | Inyana, inka nkuru | Kugira umuriro mwinshi 40-41 °C, ibisebe mu kanwa, ku mabere, no binono | - Koza ibisebe - Gutera antibiotique na sulfamides - Kororera mi kiraro |
| 6. Ubutaka (Anthrax) | Inyana, inka nkuru | Izafashwe akenshi zipfa ako kanya nta bimenyetso by'indwara byigaragaje Kugira umurimo mwinshi 40-41 °C, guhinda umushyitsi, kutarisha, umutima utera cyane, ingorane mu guhumeka, inyama zisa n'izababutse, guhitwa amaraso, kuganga amaraso | Gukingira Gutera za antibiotiques Gutwika inka yishwe n'ubutaka |

| | | | |
|-------------------------------------|--------------------|---|---|
| 7. Ubutaka bubyimbisha (BQ) | Inyana, inka nkuru | Kugira umuriro 41-42° (AC, kugira ububyimba bunini ku rwakanakana, mu gituza, mu nyama zo mu itako, no mu kaboko kubyimba inturugunyu | Gukingira Gutera za antibiotiques |
| 8. Amakore (af-ata n'abantu) | inka nkuru | Kuramburura ku mezi 6, kuzana ububyimba mu ngingo z'amaguru n'amaboko, kubyimba amabya (imisuha) | Gukingira na B 19 Kwica inka zafashwe |
| 9. Igituntu (gifata abantu) | inka nkuru | Kugira umuriro rimwe na rimwe, kunanuka bikabije, gukorora cyane, guhumeka nabi, kubyimba inturugunyu zo ku bihaha, kugira utubyimba turimo amashyira mu icebe, no mu mura, amata ajya gusa n'icyatsi kibisi kivanze n'umuhondo | Kwica inka zafashwe zigatwikwa iyo cyafashe umubiri wose |
| 10. Ifumbi y'icebe | inka nkuru | Kugira umuriro, amabere icebe birashyuha kandi n'imoko zikabyimba, amata arimo amashyira | Kugira isuku ku mukamya n'ibikoresho byo gukama Gutera antibiotiques |
| 11. Babeziyoze | inka nkuru | Kugira umuriro amaganga y'umuhondo no kubyimbirwa | Gutera imiti yica uburondwe Kuvurisha berenil |

UBWOKO BW'INKA BUTANGA INYAMA

Boran

- Boran imenyereye imibereho yo mu Rwanda (zirahari)
- Yihanganira indwara z'ahantu hashyuha
- Ikura vuba
- Iboneka Kenya, Tanzania



Brahman

- yihanganira ubushyuhe, isazi n'utundi dukoko kubera uruhu rwayo rufite umubyimba munini.
- Zishoboye imibereho yo mu Rwanda
- Zaboneka Afrika yepfo



Simental

- Ubwoko butanga inyama n'amata afasha inyana n'ibimasa gukura neza kandi vuba
- Ubwoko bukomoka mu Ubusuwisi ariko bwabanguriwe ku yandi moko atandukanye hashakishwa andi moko (flexvieh)
- Ubu bwoko buba no mu Rwanda bushoboye imibereho yaho
- Bukomoka mu Uburayi na Africa yepfo



Sahiwal

- Zihanganira ubushyuhe
- Zigira amata
- Zikuravuba



Limousin

- Zikura vuba
- Zibyibuha cyane
- Zikomoka mu Ubufaransa /SA
- Ntabwo ziragera mu Rwanda



UBWOROZI BW'INGURUBE



- Ingurube irya ibiryo bike ariko ikiyongera ibiro byinshi kandi vuba kurusha ayandi matungo ;
- Ingurube irya byose uyihaye : ibisigazwa byo mu gikoni, ibiryo bikomoka ku bikatsi, ibituruka ku mavuta, ku miceri, ku ma- sukari, ku bworozi bw'amafi kandi bikayigirira akamaro. Ibyo bishobora kuzuzwa n'inyama, ubwatsi, ibinyampeke, n'imbuto.
- Ingurube itanga ifumbire ikoreshwa mu mirima kugira ngo umusaruro wiyongere.

Icyitonderwa: Ariko umworozi agomba kumenya ko ingurube itagomba gutungwa n'umwanda uko abenshi babyibeshyaho ;

Ingurube itunzwe no kurya imyanda no kuyibamo iba irwaye inzoka nyinshi n'utundi dukoko ku mubiri wayo bityo bigatuma inenwa , ntitange umusaruro ugaragara kandi ishobora kwanduza abantu indwara.

Ibitera ibihombo bigaragara mu micungire y'ubworozi:

1. Icyororo kibi gitera igihombo
2. Imicungire mibi y'icyororo itera ibihombo
3. Igaburo n'ibiryo bidakwiye nabyo biri mu mpamvu zitera umusaruro muke mu bworozi:
4. Ikiraro cyangwa ibiraro bibi nabyo bifite ingaruka mu kugabanya umusaruro ukomoka ku bworozi bw'ingurube:

5. Indwara ziri mu mpamvu ya mbere ziteza ibihombo mu bworozi, iyo zidakumiriwe cyangwa umworozi azirinde amatungo ye:

Inkingi zashingirwaho ku bworozi bw'ingurube

Kugira ngo ubworozi burusheho kugenda neza, bunatanga n'inyungu:

- Umworozi agomba kumenya guhitamo icyororo cyiza, akagicunga neza, akagaburira neza amatungo ye, akayitaho akayarinda indwara. Kandi ayo matungo agomba kuba mu kiraro cyubatswe uko bikwiye kandi gifite isuku.

Kumenya gutandukanya amoko y'ingurube yororerwa mu rwanda

Amoko ya kizungu atatu y'ingurube yorererwa mu Rwanda atanga umusaruro ugaragara iyo umworozi agabuye neza ni Pietrain, Landrace na Large white.

1. Pietrain:

Niyo ngurube igira inyama nyinshi, ibinure bike kurusha ayandi moko ariko inyama zayo zikaba ngufi cyane cyane ku mataka.

Inenge ya Pietrain nuko ikunze kugira ikibazo cyo guhungabana vuba kandi ntishoboye kurwanya indwara cyane, bityo biba byiza kuyivanga na Landrace.

2. Landrace:

Ni iya kabiri mu kugira inyama nyinshi. Inyama zayo ni ndende zikunzwe n'abaguzi.

N'imbyeyi nziza, ibyara byinshi kandi igacutsa byinshi kurusha Pietrain. Ishoboye kurwanya indwara kurusha pietrain iyo icunzwe neza. Itanga umusaruro mwinshi kandi mwiza iyo ivanzwe na Pietrain.

3. Large white:

Itanga umusaruro muke w'inyama ugerenyanyije nayo mako yavuzwe haruguru kubera igira ibinure byinshi kurusha inyama. Gusa n' imbyeyi nziza kuzirusha zose; n'iya mbere mu kurwanya indwara n'ihungabana. Inyama zayo ziraryoha kurusha izindi kubera ibinure igira. Ikunze kuvangwa na Landrace kugira ngo igire umusaruro bwiza.

Bityo umworozi ukeneye umusaruro uhagije mu bworozi bwe yorora ibyimanyi by'ayo moko uko ari atatu cyangwa ibyimanyi bya Pietrain na Landrace.

Umworozi ahitamo icyoro cyiza yibanda ku burumbuke, imikurire n'imico y'ingurube:

a. Uburumbuke

Burangwa na:

- Umubare w'amabere w'inyagazi ugaragaza abana yagira ubushobozi bwo gututsa

- Umubare y'ibibwana bivuka kuri buri rubyaro;
- Umubare w'abana bacuka kuri buri rubyaro.

b. Imikurire

Igaragazwa n'uburyo ibibwana byiyongera ibiro kuva bivutse.

Ibibwana bipimwa ubwa mbere bifite ukwezi kumwe, hanyuma buri kwezi kugeza amezi arindwi. Ibiro byiyongera bigabanwa hagati y'iminsi yacyiyemo. Ayo magarama iyo ari hejuru niho ingurube iba yunguka vuba inyama zikenerwa.

Urugero rw'ibiro ingurube ikwiye kuba ipima hakurikije amezi y'amavuko ifite:

Ukwezi 1 : 15-18 kg

Amezi 2 : 23-28 kg

Amezi 3 : 30-35 kg

Amezi 4 : 45-50 kg

Amezi 5 : 60-70 kg

Amezi 6 : 75-90 kg

Amezi 7 : 95- 110 kg

Iyo ubworozu bugaragaza ibiro biri muni y'ibyo, nyirabwo agomba gutangira gushakisha aho impamvu zibitera zituruka (ubwoko, imirire, imicungire, ubushyuhe, indwara.....).

IBIRARO

Ibiraro bigomba kugira umwanya wo kwinyagamburiramo, umwuka mwiza, isuku. Pavement igomba kuba igizwe na beton ikomeye, hagatunganwa na rigole ziganisha amaganga ahabigenewe. Ibimoteli bigomba gusakarwa kimwe n'ahajya amaganga.

Ikiraro cy'ingurube ibyariramo kugeza icukije, hagomba guteganywa ikibambasi cyangwa ibiti.

Ikiraro gishobora kubakwa n'ibiti mu mwanya w'amatafali ahiye cyangwa wa bloc ciment.

Hasi, ni ngombwa ko hakoreshwa beto ikomeye, kandi y'igihari (ku buryo hasi hatanyerera).

Ikiraro kigomba kugira ubuhande butuma amaganga asohoka, ye kureka aho ingurube ziryama.

Ibipimo by'ikiraro:

- Imfizi : hagati ya :8-10m²
- Inyagazi n'abana bayo : 10m²
- Inyagazi idahaka : 2,5m²

- Ingurube ikonye : 2m2
- Ishashi : 2m2

Ikiraro cy'imbyeyi Kigomba kuba gishinzemo ibiti bigitandukanya n'aho ibibwana bikivuka bizajya biba kugira ngo nyina itabiryamira mu gihe cyo kubyara cyangwa icyo konsa .

Imbehe n'igikoresho cyo kunyweramo;

Bigomba kuba bikoze mu giti gikomeye ; Ibyiza n'ukubikora mu giti kiremereye ku buryo ingurube itagisunika ngo gihirime igihe cyose ishakiye. Ibyo bikorwa mw'ishusho y'umuvure mitoya.

Icyitonderwa : nta myenge minini igomba kuba hasi hagati y'imbabari kugira ngo ingurube itavunika ikirenge giseseyemo



IMYOROROKERE

- Amacugane**, n'imwe mu nzitizi zisubiza ubworozi inyuma. Umworozi agomba kumenya ko ni bibi cyane kwimisha ingurube zifitanye isano kugeza ku gisekuruzwa cya gatanu aribwo buvivi. Ibi birinda ubworozi gucika.

Kimwe mu bifasha kurinda amacugane ni ugutera intanga hakureshejwe intanga ziteguriweho (fresh semen) no kugenzura icyororo hakorwa imyandiko z'ubworozi. Aho bidashoboka ugomba kwitondera uburyo wateguyemo imfizi n'uburyo uzisumbaza.

- Ibimenyetso byo kurinda**; biba bitandukanye, inda y'amaganga irabyimba, igatukura, igata ururenda. Inyagazi cyangwa ishashi ishaka guca ikiraro, irasakuza, yanga kurya.

Iyo ibana n'izindi irazurira, ariko mu bimenyetso byose, ikigomba kwibandwaho cyane ni igihe ihagarara hamwe ikika ntinyeganyeye iyo yuriwe n'umushumba cyangwa se ayikanze mu mugongo nkigiye kuyimya. Iyo icyo kimenyetso cyagaragaye mu gitondo, ingurube iterwa intanga ni mugoroba. Iyo kigaragaye ni mugoroba, iterwa intanga ejo mu gitondo.



- c. **Kurindishiriza hamwe:** Umushumba akora uko ashoboye kugira ngo ingurube zabyaye mu minsi yegeranye zirindana zigacukiriza rimwe (n'ukuvuga umunsi umwe).

Inyagazi zivanywa mu biraro aho zonkerezaga umunsi umwe, zikajyanwa mu bindi biraro. Ibibwana bigumamo.

Izo nyagazi zakuwe bu biraro zabyariyemo, zegerezwa imfizi iyo bishobotse, cyangwa hakazanwa mu biraro byazo icyarire kivuye mu kiraro cy'imfizi, bityo zikacyihumuriza (ibyo bituma zihuta kurinda)

Icyitonderwa: ingurube zigomba kugaburirwa neza kandi byinshi mu gihe zonsa kugira ngo zizacutse zifite umubiri mwiza, ntizizire urwonko, bityo mu minsi itarenze 10 (zirinda hagati y'iminsi 5-7 muri rusange) nyuma yo gucutsa ziba zarinze. Kandi kuba zaragaburiwe neza bituma amagi (ovules matures) yitegura kwakira intanga aba menshi. Bigatuma umubare w'abana bavuka uba mwinshi.

IMIRIRE

Imirire ifite akamaro kanini mu bworozu bw'ingurube kugira ngo bwunguke. Indyo itanogeye umubiri akenshi niyo soko y'ingaruka mbi. Inkurikizi yayo ni uguhurumura, ukutituma neza, kubyara binaniranye, kubura amagurubegurube.

- a. **Igihe kigenewe kubika ibisigazwa byo mu nganda cyangwa ibiryo byo muri resitora**

Amata cyangwa ibisigara nyuma yuko uruganda rwarangije gutegura no kubika imbuto cyangwa amata byagenewe abantu. Ibyo bisigazwa, kimwe n'ibyo muri resitora, ntibigomba kubikwa igihe kirekire ngo bigere aho bigaga. Iminsi ntarengwa yakagombye **kuba ni 3**. Ibitu byose bitaribwa bigomba gutoranywamo bikajugunywa.

Igihe gikwiye cyegenerwa mu kubika ibihari by'ibigori cyagombye **kutarenza amezi 3** kandi bibikwa ahantu hinjira umwuka uhagije hadafunganye kandi humutse neza. Naho ubundi ibigori bikunze kubyara urubobi n'uruhumbu, biviramo uburozi bwitwa **afatoxine** bukunze kwica ingurube no kuzidindiza mu mikurire. Ibihere by'ingano bibikika neza kurusha.

Muri rusange Indyo ku ngurube igizwe n'ibya ngombwa bikurikira:

Indyo ikungahaye mu gutanga ingufu bita énergetique: 75% - 80% (urugero; ibigori, ingano, amasaka, imyumbati yumye, ibijumba, amavuta, ibiheri by'ibigori, iby'ingano iby'umuceri; ibisigazwa by'ibihwagari, iby'ipamba; amavuta, cana amabilis...);

Icyitonderwa: Ibigori bigomba kuba biseye (0,5 mm-0,8mm), binoze kurusha ibigaburirwa inka cyangwa inkoko. Bitabayeyo ingurube zirwara constipation, ibisebe mu gifu no gutumba, amaherezo yabyo n'ugupfa. Na none ibyiryo biseye kurenza urugero bituma ingurube zitituma neza.

Indyo ikungahaye mu byubaka umubiri aribyo protéinique: 15%-20% (urugero soya, calliandra, leucena, moringa, ifu y'indagala, ifu y'amaraso, ifu y'inyama, amacunda, alfalfa...);

Ibiryo bikungahaye mu birinda umubiri indwara(vitamine: premix, imboga z'ubwoko butandukanye, imigozi, kimari ...); Ibikomeza amagufa (mineraux: Ifu y'amagufwa, ishwagara, gikukuru, ifu y'ibishishwa, by'amagi), zitangwa kandi n'imboga n'amashu, imigozi, kimari) Vitamine na Minerals bikunzwe gutangirwa rimwe mu kigero cya 5%

b. Ibipimo by'ibiryo bitangwa mu ngero z'amafufu: IBIRO BY'INGURUBE URUGERO KU MUNSI IKIGERO IGEZEMO

- Ibibwana bikiri bito bifite 20 kg mu rugero: 1 kg cy'ibiryo ku munsu Amezi 2,5
- Ibibwana bicutse bifite 30kg mu rugero: 1, 4 kg by'ibiryo ku munsu Amezi 3,5
- Ingurube bipima ibiro 40kg mu rugero: 1, 8 kg by'ibiryo ku munsu Amezi 4
- Ingurube zipima ibiro 50kg mu rugero: 2, 2 kg by'ibiryo ku munsu Amezi 4,5
- Ingurube zose zifite ibiro hejuru ya 60: 2, 5 kg by'ibiryo ku munsu Amezi 5.

Indyo igaburwa kabiri ku munsu; bitarenze saa tatu hatangwa igice cya mbere, igice cya kabiri gitangwa saa cyenda, bitarenga saa kumi.

c. Uburyo inyagazi igaburirwa kuva (ihaka, ibyaye, yonsa)

Inyagazi ihaka, kuva ku munsu wa 8 igabanyirizwa ibyo yaryaga bikagera ku biro 2 ku munsu. Ingurube ihaka ntikenera ibiribwa byinshi kuko iraremera cyane kandi ibike irya ibikoresha neza. Ikindi nuko ingurube yabyibushye cyane inanirwa kubyara bityo abana bayo bagapfa bavuka. Iyo ishigaye iminsi 3 ngo ibyare, umworozzi ayigabanyiriza ibiryo kugeza **ku kiro 1 ku munsu**. Umunsu iri bubyare ntacyo inyagazi igomba kurya. Muri icyo gihe cyose igomba kubona amazi ahagije.

Ingurube yabyaye: mu munsu **ibiri ya mbere** imaze kubyara irya bike ikiro 1, ikannywa amazi menshi. Hanyuma igipimo kigenda kiyongera buhororo buhoro hakurikije uko irya n'umubare w'ibibwana yabyaye. **Nyuma y'icyimweru kimwe** iba irya ibiryo bikubye inshuro ebyiri n'igice kugeza inshuro eshata y'ibyo yaryaga mbere.

(Ishobora kurya hagati ya 5 kg na 7,5 kg bitewe n’umubare w’ibibwana yonsa). **Iyo ndyo igaburwa 3 ku munsu**. Amazi akomeza gutangwa menshi. Hagomba buri gihe kubamo inyongera **y’imyunyu**. Ibyo byose bituma inyagazi ibona amagurubegurube menshi kandi ntigandare kubera konsa cyane.

Inyagazi iri bucutse mu gitondo, ntigaburirwa ni mugoroba, bayima n’amazi. Umunsu wa mbere icukije ihabwa ikiro1 cy’ibiryo umunsu wa 2 na 3 ihabwa ibiro 2 ku munsu. Kuva ku munsu wa 4 kugeza yimye ikanageza umunsu wa 8 ihabwa hagati y’ibiro 2,5 na 3 by’ibiryo n’inyongera y’imyunyu. Inyongera y’indyo n’imyunyu ituma ingurube yongera umubare w’abana izabyara.

d. Ingero z’indyo ku byiciro bitandukanya by’ingurube:

i. Urugero rw’indyo **y’ingurube zonsa**, ku gipimo cy’ibiro 100, hajyamo ibi bikurikira:

- Ibigori biheze : 28 kg
- Igiheri (son) cy’ingano I : 35 kg
- Igiheri (son) cy’ingano II: 22 kg
- Soya ikaranze : 14 kg
- Ishwagara : 0.5kg
- Premix : 0.5 kg

ii. Urugero rw’indyo **z’ingurube zihaka** ku gipimo cy’ibiro 100, hajyamo ibi bikurikira:

- Igiheri cy’ingano I : 35 kg
- Igiheri cy’ingano II: 60 kg
- Soya ikaranze : 4 kg
- Ishwagara : 0.5 kg
- Umunyu : 0.5 kg

iii. Urugero rw’indyo **bigenewe ingurube zibyibushywa** ku gipimo cy’ibiro 100, hajyamo ibi bikurikira:

- Ibigori biheze : 9 kg
- Igiheri cy’ingano I : 55 kg
- Igiheri cy’ingano II : 35 kg
- Ishwagara : 0.5
- Premix : 0.5

Ingurube cyane izabyaye ntizigenerwa amazi, agomba guhora mu kibumbiro

Ibyihutirwa guterwa mu butaka kugira ngo imirire inozwe ku mafaranga make cyane ku borozi bafite ubutaka bugari, haterwa ku mirwanyasuri no ku rugo ni ibinyamisogwe n'indabyo nka Kana ibibilis,

Calliandra na leucena (ni legumineuse nziza zikunze kwera hose kandi zitanga ifumbire mu butaka.) zikoreshwa mu mwanya wa soya kuko bihendutse kuzihinga, zitanga kandi n'ifumbire mu murima zitewemo.

Muringa ni legumineuse nziza cyane kandi itinda mu murima itawangiza. Isimbura neza soya, indagala n'ifu y'inyama n'iy'amaraso mu gutanga ibyubaka umubiri.

Icyitonderwa: Muringa ntikura neza mu misozi miremire kandi ahakonje. Ariko mu turere dushyushye ikura neza kandi irakungahaye cyane muri proteine na lysine ari nabyo bituma itungo rigira inyama nyinshi.

Alfalfa itewe ku migende mitoya yumutse, ifumbiye neza kandi ibona amazi. Iyo Alfalfa igomba kuba yatewe ku mirongo.

Icyitonderwa: Usibye alfalfa itwo duti duhora dusarurwa dukiri duto, nta gutegereza ko dukura dukaba ibiti bini, kuko umusaruro uba mucye.

Canna (n'icyatsi kandi ikirabo cyiza kigaburirwa ingurube). Iterwa ku mirwanyasuri, irwanya isuri kandi ntikihungabanwa cyane n'izuba mu gihe ibindi byatsi muri rusange biba bimaze kuma. Icyo cyatsi gifite vitamine kandi gitera imbaraga.

UBURYO BWO KURINDA INGURUBE INDWARA KUVA ZIKIVUKA

a. Ibikorera inyagazi igiye kubyara n'ibibwana bivutse kugeza ku bicutse:

Ishigaje iminsi cumi n'itanu ngo ibyare:

- Kuyuhagira umubiri wose no ku mabere hakoreshajwe icyangwe (cyangwa ikiroso cyoroshye) n'isabune;
- Guhabwa umuti uvura inzoka (Albendazole cyangwa Ivermectine) hakurikijwe ibipimo.
- Hasigaye iminsi 3 ngo ibyare, iterwa umuti wa vitamini na Penicilini.
- Kwimurirwa mu kiraro cyabanje gukorerwa isuku kandi cyatewemo umuti wica udukoko nkuko byavuzwe haruguru. Bidashobotse iguma mu kiraro cyayo ariko cyabanje gukorerwa isuku, **cyaratewemo umuti wica udukoko iminsi 3 mbere.**

Hasigaye umunsi umwe ngo ibyare:

Yongere kuhagirwa neza, hagashyirwa mu kiraro cyayo isaso isukuye kandi yumutse. Ntihabwa ibiryo, ariko igahabwa amazi yo kunywa ahagije.

Mu gihe iri kubyara:

Umworozi agomba kuyiba hafi ngo ayifashe iyo bibaye ngombwa, afashe n’abana bavuka kutaryamirwa na nyina no konka ku bifite intege nke.

Imaze kubyara:

Umunsi wa mbere ihabwa ibiryo bike, 1kg, nyuma igipimo kigenda kiyongerwa mu mbehe buhoro buhoro ku buryo nyuma y’iminsi irindwi iba irya ibiryo byikubiyemo inshuro ebyiri cyangwa eshatu kubyo yari isanzwe irya hashingiye ahanini ku mubare w’abana yonsa.

Icyo gipimo gikomeza kugeza igihe icukije. Guhoza amazi mu mbehe.

Ibibwana bigomba kurindwa kuryamirwa na nyina, hakoreshejwe kuziba hafi no kuzifasha kumenyera kwihisha mu kazu kazo;

Ibibwana bigomba kurindwa imbeho hakoresheje isaso ryumutse cyangwa ibikarito aho bishobora kuba byikinga imbeho.

Ibibwana biterwa **intrafer (dose imwe gusa)** ku **munsi wa gatatu** bivutse **cyangwa** bihabwa itaka ry’inombe/ibumba kuva ku munsi wa munani kandi mu gihe cy’icyumweru kimwe.

Ku babishoboye, habaho guca imirizo no guca amenyo.

Ibibwana bigejeje amezi abiri, biterwa umuti uvura inzoka, bikaguma mukiraro. Nyina niyo yimurirwa mu kindi kiraro kugira ngo itegurwe kwima.

INDWARA

A. Uruheri cyangwa ubuheri bw’ingurube

Uruheri n’indwara yanduza cyane ifata amatungo yose ndetse n’abantu barayirwara. Nubwo iyo ndwara ubwayo idakanganye, ntibura gutera igihombo kigaragara mu bworozi.

Ubuheri buterwa n’agasodondwe ko mu bwoko bwa **sarcoptes** kareshya n’igice cya milimetero kagaragara kuri microsikopi. **Ako gakoko gacukura utwobo mu ruhu rw’ingurube aka ari natwo kabamo.**

Ibimenyetso by’uruheri n’uburyaryate, ingurube irikuba ku biti, ibibambasi, irishima mu buryo bwose bushoboka; uruhu rurashishuka, ruraturuka kandi ahagana kw’ijosi no ku rutugu cyane cyane hakabyimba.

Ku ruhu hazaho umwera cyangwa rukavuka ibisa n’igitaka, bikagaragara cyane ku matwi, kw’ijosi hejuru no ku mugongo. Amaherezo rugakomera cyane ndetse rukanasaduka.

Ingaruka nuko ingurube kubera guhora yishima, ubutaruhuka, itakaza imbaraga nyinshi, ntikure neza. Nyuma ingurube igira ibyo itakaza mu mubiri cyane izihaka zishobora no kuramburura, izibyibushya umworozi yongeraho hafi ukwezi mu gihe ngombwa cyo kubyibushywa

Uburyo bwo kurwanya Uruheri

- Ingurube zishyirwa mu biraro byegeranye. Ibyo biraro byakuwemo ingurube, bikorerwe isuku, hanyuma biterwemo umuti wica utwo dukoko. Igipimo c'y'umuti kigomba kubahirizwa.
- Hari bukoreshwe **Deltametrine, Pyrethrine** (Deltax cyangwa Deltanex, Permapy). Umuti uterwa mu gitondo, hose, mu mbaho, hasi no ku mabati. Ibyo biraro biguma nta kirimo umunsi wose, bikumuka neza, mangoire zirozwa kugira ngo umuti udahumanya ingurube.
- **Ibyarire** birimo indwara bigomba gutwikwa.
- Ingurube zose ziterwa **Ivermectine**, hubahirizwa ibipimo, mu ruhu(**S/C**) cyangwa hagakoreshwa imiti yo kuhira.
- Ingurube zazahaye cyane ziterwa **Multivitamine** hakurikijwe ibiro, mu nyama hagati (**IM**). Buri imwe imaze guterwa umuti, ishyirwa muri ibyo biraro byakorewe isuku. **Ibyo bikorwa ni mugoroba.**
- Ibiraro bimaze gukurwamo ingurube nabyo bisukurwa nkibya mbere.
- **Icyo gikorwa gisubirwamoko ubwa kabiri nyuma y'ibyumweru bibiri**, hanyuma kikajya **gikorwa buri mezi atandatu.**
- Ubundi hagati aho n'ukuvuga nyuma y'amezi ane, ingurube ziterwe gusa ivermectine cyangwa zahirwa na Deltametrine.
- **Ubundi, iyo inyagazi ivuwe mbere yuko ihaka cyangwa ibyara, abana ntibandura bakivuka nkuko bikunda kuboneka.**

B. Indwara ya rouget ();

Rouget n'indwara iterwa na **bacterie** yitwa Erisipelotrix Insidiosa. N'indwara ifata andi matungo ndetse n'umuntu ariko icyo gihe ubukana bukaba bworoheje.

Mikorobi yiyo ndwara iboneka mu butaka, ahantu hahehereye, mu mazi, mu biribwa. Umuntu arazigendana mu nkwezi, muri bote azivanye mu biraro byanduyeye; iyo ndwara ishobora kuguma mu ngurube yatabwe mu gihe cy'amezi cyenda yose.

Mikorobi erizipelotrix iranakwirakwizwa n'udukoko tunyonyuza amaraso y'ingurube tubarirwa mu bwoko bw'iburondwe, bwitwa "**argazide**". Iyo mikorobi ndetse iba no mu ngururube ubwayo itagaragaza ibimenyetso by'uburwayi.

Ariko iyo ndwara ikunze gufata ingurube ziri hejuru **y'amezi 3.**

Indwara ikunze kugaragara iyo ingurube yacice intege cyangwa ihungabanijwe n'impamvu zitandukanye.

- Ubushyuhe bwinshi (mu mpeshi)
- Indyo mbi
- Urugendo, gukingirwa,
- Gukoreshwa cyane (kwimya inshuro nyinshi)

Ibimenyetso by'indwara; icyo bita "rouget blanc"

Uburyo bwa mbere: Ingurube igira umuriro mwinshi cyane kugeza kuri 42oc, inanirwa kurya, igatitira, yubika umutwe hasi, ubundi ikananirwa kugenda, yikuruza ku matako. Iyo ngurube ipfa hagati y'amasaha 12 na 24. **Hari igihe ingurube ipfa, umworozi atagize igihe cyo kubona n'ikimenyetso na kimwe. Ubwo buryo bugaragara mu gihe cy'impesha cyane cyane.**

Uburyo bwa kabiri, ingurube igaragaza umuriro mwinshi n'ibimenyetso bitukura ku mubiri (amatwi, imbere mu matako, ku nda no ku mubiri ahandi) hazaho ibiziga by'amaraso, gutukura uruhu. Ingurube iracumbagira, iratitira, inananirwa kurya. Iyo itavuye vuba, irapfa nyuma y'iminsi 2 cyangwa 4.

Uburyo bwa gatatu ni Akaramata. Ingurube yakize ibimenyetso twavuze haruguru kandi itavuye ikunze kugumana ibisigisigi by'iyi ndwara, uburwayi b'umutima bituma ibyimba amaguru n'amaboko. Hakabaho ubwo irwara kubyimba mu ngingo. Hari n'igihe haziramo n'izindi ndwara z'byuriririzi nka Salmonenelose cyangwa Pastereulose.

Uburyo bwo kuvura no kurinda ayandi matungo.

Iyo indwara igaragaye , umworozi agomba guha ingurube zose imiti yica mikorobi. Hakunze ukoreshwa Penicilline, igatangwa iminsi itatu ikurikiranye ku gipimo kigenewe buri tungo. Ku ngurube zarwaye hiyongeraho umuti urwanya umuriro n'ikibazo cyo kubabara mu ngingo (hakunzwe gukoreshwa Phenyibutazone).

Iyo hagaragayemo inda ku ruhu rw'ingurube (argazide), hakoreshwe n'imiti yagenewe kurwanya utwo dukoko no gufuhera mu biraro hose.

C. Inzoka

Inzoka ziba mu nda cyangwa mu mubiri w'ingurube, zizitera guhitwa, gufuruta, kunanuka, guhumeka nabi, cyangwa kugira ibibazo mu bwonko iyo zitavuye hakiri kare. Biterwa n'uburyo izo nzoka zibaho: izitungwa n'ibiryo ingurube irya, zimwe ziguguna inzira nyobokabiryo mu mpande, izindi zitungwa n'amaraso y'ingurube.

Haba n'iziba mu bihaha Ingurube yazonzwe n'inzoka iba ifite intege nke ku buryo ishobora kwandura n'izindi ndwara ziterwa na mikorobi.

Hari **n'izanduza** abantu iyo bariye inyama z'ingurube yanduye, hanyuma zigasubira zikanduza ingurube iyo iriye umwanda w'umuntu wanduye.

Zimwe mu nzoka igurube zikunze kurwara mu Rwanda:

- **Runwa:** ni inzoka zumweru zifite umubyimba w'uruziga zireshya na cm 15, ziba mu mara y'ingurube zabanje kunyura mu mwijima no mu bihaha. Rimwe na rimwe ingurube zirazinyanya.
- **Rushe :** ni inyo za teniya umuntu arwara. Zifita ishusho y'agasabo kaba mu mihore, ku rurimi no mu mutima w'ingurube yabazwe. Umuntu yandura tenya iyo ariye inyama z'ingurube iyirwaye. Cyane inyama zidahiye neza.
- **Strongles:** ni utuyoka duto cyane tupima cm 1 tukagira umurambararo ungana na mm 1 zimwe ziraturuka(izitunzwe n'amaraso) izindi ziba umweru. Ziba mu mara mu bihaha cyangwa mu gifu cy'ingurube.
- **Trichures:** ni inzoka zibungurushyeye zireshya hagati ya cm 3- 5 ziba mu mara y'ingurube. Zituma ingurube ihitwa amaraso iyo zibaye nyinshi.
 - **Strongyloides:** ni utuyoka duto cyane dupa hagati ya mm3-5, twanduza gusa abana b'ingurube bacyonka . Inyagazi ziba zizifite ariko nta ngaruka zizigiraho.

Uburyo bwo kurwanya inzoka zo mu ngurube :

Inyagazi:

- Iminsi 15 mbere yuko inyagazi zibyara, kuziha umuti bwa mbere,
- Umunsi ukurikiraho, gukuramo amabyi , koza aho ziri
- Iminsi 3 mbere yuko zibyara, kuziha umuti w'izoka ubwa kabiri
- Umunsi umwe mbere yuko zibyara, koza neza inyagazi no gusukura inzu.

Abana b'ingurube:

Iyo ibyo bakorereya inyagazi byakurikijwe neza, nta muti w'inzoka abana bakenera mbere yuko bacuka

Ingurube zibyibushywa:

- Iminsi 2 cyangwa nyuma yo gucuka, kuziha kuziha umuti w'inzoka bwa mbere.
- Gusukura nyuma y'iminsi 2
- Nyuma y'iminsi 14, kuziha umuti w'inzoka ubwa kabiri
- Gusukura.

Imfizi

- Ihabwa umuti w'inzoka buri mezi 4, n'ukuvuga inshuro eshatu mu mwaka

D. Uguhitwa kw'abana b'ingurube

Uguhitwa gutera no:

- Kurya nabi
 - Korora nabi
 - Mikorobi
- a. **Inzira nyobokabiryo** iyo itabonye umwanya wo kwimenyerezwa ngo ikore imusemburo, ibiryo ntibishoboke kugogoroka neza, bihita vuba mu nzira nyobokabiryo. Ariko iyo bamenyereje umwana w'ingurube utaracuka, kurya ibiribwa bijyanye n'ikigero ugezemo, ugeza igihe cyo gucuka ufite imisembure ngombwa iwufasa kurenga icyo gihe kitoroshye nta kibazo ihuye nacyo.

Uko kuyumenyereza buhorobuhoro buhoro bituma amara nayo yiyagura buhorobuhoro umwana adahungabanye, bitawuteye kuruka no guhitwa.

- b. **Uburyo bwo korora** : Ubukonje n'ubutohe mu gihe abana b'ingurube baryama hasi ku isima bubatera inzoka bityo bituma bahitwa bakaruka. Korora ibyana byinshi bicucikanaye nabyo bitera guhitwa.
- c. **Mikorobi ziyongera** iyo umwana w'ingurube uriye ibiryo byinshi utarameneyera, cyangwa udashobora kugogora kubera kubura imisemburo ijyanye nabyo, bityo mu nzira nyobokabiryo huzuramo ibiribwa, bigahuguta, hanyuma mikorobi zitera indwara zikiyongera kurusha izidatera indwara.
- d. **Kubura amaraso ku bibwana** bitatewe fer hagati y'iminsi 5- 8 bimaze kuvuka (kirize y'ibyumweru 3).

Iyo ndwara ikunze kugaragazwa no guhagara gukura nyuma y'ibyumweru 3 bivutse, umunwa wo hasi ukeruruka cyane, uruhu rukazana iminkanyari, hakurikizazaho gupfa.

Umworozi agomba gukora uko ashoboye, kurinda ubwiyongere bwa mikrobi

- Koza koza inyagazi no gutera umuti mbere yuko ibyara kugira ngo umwana w'ingurube udahura na mikorobi nyinshi;
- Guha inyagazi umuti w'inzoka mbere yuko ibyara kugira ngo itanduza abana inzoka
- Gutunganya ikibuti cy'abana b'ingurube gishyushya kugura ngo zidahura n'ubukonje. Ibibwana bibamo iminsi 15 ya mbere.
- Gutera umwana w'ingurube urushinge rwa interferon ku munsu wa 5-8 kugira ngo bawufashe kurwanya ibihe bibi by'igabanuka by'amagurubegurube kandi utarashobora kurya ibiribwa bikomeye.
- Kugaburira neza inyagazi kugira ngo umwana abone amagurubegurube ahagije meza

- Kugaburira umwana w'ingurube ibiribwa byihariye mbere y'icuka kugira ngo inzira nyobokabiryo imenyere buhorobuhoro ibiribwa byuzuye. **Umworozi atangira kugaburira abana b'ingurube ibiribwa bikomeye hakiri kare, kuva hagati y'iminsi 8-10 bavutse.** Ibyo biribwa bigomba kuba biryoshye, birimo agasukari. Umworozi agabura duke duke inshuro nyinshi ku muni, nyuma akabaha ibyo bashatse byose iyo batangiye kurya byinshi.
- Umwana w'ingurube agomba kuba yarayiye nibura ikiro 1,5 y'ibiri mbere y'uko ucuka ;
- Mu gihe cyo gucuka, umworozi, agomba kugera indyo kuko kubera umwana w'ingurube utacyonka uba ushaka kurya birenze urugero.
- Kudashyira abana benshi mu nzu imwe, umworozi ntiyakagombye kurenza abana 15 mu nzu imwe. Bishobotse akora udusiko tw'abana bameze kimwe.
- Kuzigaburira ibiribwa binogeye umubiri kandi byiza, amazi meza yo kunywa

Uko indwara y'icuka ivurwa:

- Umworozi yima abana b'ingurube ibiribwa amasaha 12 kugeza kuri 24.
- Abaha amazi meza cyane make make inshuro nyinshi ku muni.
- Nyuma atangira kubaha ibiryo bike bike, buhoro buhoro.
- Abana basubira kurya ibyo bari basanzwe bafata ku muni nyuma y'iminsi 3 cyangwa 4
- Umworozi agomba gusukura buri gihe aho ziba
- Agomba kukuramo vuba ibipfuye
- Agomba kuvanamo izirwaye nizo akeka ko zirwaye mu zindi akazishyira ukwazo

Imiti itangwa ari uko muganga yasuzumye itungo akamenya icyo ibibwana birwaye, inzoka, mikorobi, cyangwa impiswi nta yindi mpamvu. Imiti ihabwa abana b'ingurube bose cya rimwe mu minsi itatu byibura.

E. Kumererwa nabi kw'inyagazi zihaka

A. Impamvu zidaturuka ku bwandure

Kuramburura, kubyara bake, kubyara abana bananutse, n'ibibazo biteza igihomba mu bworozi bw'ingurube kandi bikaba ari ingaruka zo kumererwa nabi kw'ingurube mu gihe ihaka. Uko kumererwa nabi guturuka ku mpamvu zitandukanye (ubuzima bwite bw'inyagazi, imirire, uburyo bwo korora, ibwandure).

i. Impamvu zituruka ku buzima bwite bw'inyagazi:

- Inyagazi ibyara ubwa mbere ibona ibibwana bike. Uwo mubare ugenda wiyongera buhoro buhoro, ugera kuri 10- 12 ku rubyaro rwa 3 muri rusange.

- Ingurube ibyaye ikiri nto cyane cyangwa ishaje cyane ibyara ibibwana bike
- Amacugana atuma ingurube ibyara ibibwana bidashitse, biremaye cyangwa bipfiriyeye mu nda. Niyo mpamvu, ingurube igomba kwima igejeje igihe, iyo ishaje igasimburwa n'iyindi, kandi hagombera kwirinda amacugane.

ii. Impamvu zituruka ku mirire: Indyo idahagije ituma abana b'ingurube badakomera, bakaremara, bakarwara ibisebe. Inyagazi nayo ishobora guhurumura.

- Ibiribwa biseye cyane bituma ingurube itituma neza, naho ibiheretuye cyane, bituma ingurube irwara igifu
- Indyo ituzuye (ibura ibyubaka umubiri, vitamini cyane A na E), imyunyu, cyangwa ibiribwa byatoye uruhumbu, bituma igomera, irwara ifumbi y'amabere, ubudahembera, kubyara abana bake,

Niyo mpamvu, ingurube ihaka igomba kwitabwaho, ikarya indyo yuzuye, itari nyinshi cyane, kandi igahabwa imyunyu na vitamine. Ikindi nuko igaburo ririmo ibibyibushya cyane ntigomba guhabwa ishaha igenewe kuba icyorororo kuko yakura vuba ikazima igihe kiteregera.

iii. Impamvu zituruka aho zorororewe zigira ingaruka cyane cyane mu byumweru bya mbere byo guhaka bigatuma abana bapfira mu nda ya nyina, inyagazi ikabyara bake, rimwe na rimwe ikongera kurinda

- Izuba ryinshi n'ubushyuhe bwinshi,
- Gupakira no guhungabanya inyagazi,
- Gushira hamwe inyagazi nyinshi zihaka bigatuma zihora zirwana;
- Kutabangurira inyagazi kabiri;
- Kubangurira inyagazi ku mfizi yimya cyane;

Niyo mpamvu umworozi agomba kumenya kwita ku nyagazi ihaka. Ikiraro kigomba kuba cyuzuzwa byose bisabwa kandi inyagazi ikaba mw'ituze.

B. Impamvu zituruka ku bwandure

Izo mpamvu ziterwa na mikorobi zitandukanye

- Hari mikorobi zisanze zibana n'amatungo nta mbogamizi, ariko zikaza kuhinduka mbi ziyongera ubukana iyo ingurube ihungabanywe kubera impamvu zitandukanye. Inyagazi zishobora kwanduzwa n'umwanda iyo ubaye mwinshi, n'imfizi cyangwa amazi mabi. Izo mikorobi ni za colibacilles, streptocoques, staphylocoques cyangwa uduhumyo. Ibyo bikazitera kuramburura no kumererwa nabi.

Uburyo bwo kurywanya ubwo bwandu, ni ukugira isuku no gutera imiti yica mikorobi mu nzu no ku nkuta.

- b. Hari za virusi zitafite imbaraga zo kumerera nabi inyagazi ariko zica abana bayo mu nda, bityo ingurube zikaramburura abana bumye, cyangwa bakavuka ariko nta mbaraga, bahora barwaragurika. Hari na virus zica insoro, ingurube ntiramburure ariko igahora yongera kurinda. Uburyo bwo kwirinda na none n'ukwibanda mu gukora isuku.
- c. Izo ni mikorobi zica insoro, abana, ingurube zibyibushyw, inyagzi n'imfizi. Muri make ni muryamo. Uburyo bwo kuyirwanya n'ugukinkira aho iyo nwaru ikunze kugaragara.

Gufungirana ingurube

Igikorwa cyo gufungirana ingurube shya yinjijwe mu bworozi kiba kigamije kumenyereza itungo rishya mikorobi zaho igiye kororerwa no kurinda ubwo bworozi mikorobi zaba zazanywe naryo.

Akandi kamaro ko gufungirana ingurube nshya ni:

- Bituma ingurube shya zimenyera ahantu hashya n'indyo nshya;
- Bituma zikurira neza mu nzu ituje, irimo umwuka, ziruhuka neza;
- Bituma umworozi yita kuri izi ngurube nshya mu buryo bw'umwihariko (azongera imyunyu, vitamin n'ibindi iyo bibaye ngombwa.
- Bigabanya ihungabana mu bworozi busanzwo no ku cyororo gishya kyijye aho hantu

Uburyo bikorwamo:

- Ingurube nshya ifungiranwa mu nzu ngali, nini, irimo umwuka kandi isukuye neza; hagomba kubamo metero 100 hagati yibyo biraro
- Kuyogeshwa isabune n'uburoso, kuyifuhera cyangwa kuyitera umuti urwanya uruheri,
- Ku umuti w'inzoka umunsi wa mbere n'uwa kabiri
- Kuyitera penicilline na vitamine

Nyuma y'iminsi 2 gushyira buri muni ifumbire nke y'izindi ngurube mu cyarire cy'iyi ngurube nshya; buhoro, buhoro imennyera mikorobi zaho, igakora igakora amasirikare bazirwanya.

- Igihe cyo kuzifungirana ni hagati y'ukwezi 1 n'iminsi 40.
- Umukozi uzikorere mbere yo kwinjira mu kiraro cy'iyi nshya abanza gukaraba , guhindura bote no gukandagira mu muti wica mikorobi

Korora umubare uringaniye w'inyagazi z'indobanure, zigafatwa neza (kuryama no kurira aheza, indyo yuzuye, ihagije kandi isukuye, amazi atabura, kurindwa indwara no guhungabanwa...) zigacukiriza rimwe cyangwa mu byiciro byegeranye, zikarindira rimwe cyangwa mu byiciro byegeranye. Izo nyagazi zikimishirizwa rimwe cyangwa mu byiciro byegeranye hakoresheje imfizi y'ubwoko bwo mwimerere buzira inenge cyangwa gutera intanga.

Ngiryo ibanga ry'ubworozi bw'ingurube butanga umusaruro!

UBWOROZI BW'IHENE



1. Ikiraro

1.1. Uko ikiraro kigomba kuba kingana

- Ihene n'abana bayo zikenera m² 1,20
- Ihene y'incuke ikenera m² 0,60
- Ihene ikuze ikenera m² 0,80
- Isekurume ikenera m² 2

2. Kororoka

- Ku'ihene 100 zimye, habyara 85;
- Ku'ihene 100 zibyara, havuka abana 140 ku nyarwanda, 180 ku za kijyambere;
- Ihene yima bwa mbere imaze amezi 11-12 ivutse ku nyarwanda, amezi 9 ku za kijyambere;
- Ihaka iminsi 149-152 (amezi 5);
- Isekurume 1, ihagije inyagazi 50, kandi itangira kwimya imaze amezi 15 ivutse;
- Abana b'ihene bacuka bamaze amezi 3 bavutse bitewe n'ubwoko cyangwa uburyo ihene zororwa;
- Hagati y'imbyaro n'indi haca amezi 9-12;
- Abana b'ihene bavuka bafite kg 2 (isekurume), na kg 1.8 (inyagazi);
- Ihene nyarwanda ishobora kubangurirwa ku isekurume nyamahanga kugira ngo ishobore kugira ibiro cyangwa umukamo mwiza;
- Inyagazi bayikura mu bworozi igihe cyose ifite ibibazo bikomeye by'ubuzima;
- Ihene ivanwa mu bworozi iyo igize imbyaro 6 ku nyarwanda zisanzwe, n'imbyaro 9 ku za kijyambere ubwo iba ifite imyaka 7.

3. Igaburo

- Ihene zitungwa n'ibyatsi bisanzwe, setariya, tribusakumu, urubingo, n'ibisigazwa byo ku bikomoka ku buhinzi
- Zishobora no kurya imvange y'ifu iyo umworozi ashobora kuyibona, ibyo bituma zicutsa vuba, zikabyana kenshi, n'abana bagakura neza.

Dore uko batanga imvange y'ifu

- Ihene yonsa n'abana bayo zihabwa gr 300 cyangwa 400
- Ihene zicutse zihabwa gr 50 kugera kuri 100
- Isekurume yimya ihabwa gr 300

4. Umusaruro

Isekurume ikuze ishobora gupima kg 40, inyagazi igapima kg 30 (ihene za kinyarwanda). Iyo ihene ibazwe itanga inyama zingana na 48% z'ibiro byayo ari nzima. Ihene 3 zorowe mu kiraro zishobora gutanga toni 2 z'ifumbire ku mwaka.

5. Indwara z'ihene

| Indwara | Ikigero cy'ihene zifatwa | Ibimenyetso | Uburyo bwo kuyirwanya |
|---------------------------------------|--------------------------|--|---|
| 1. Inzoka zo mu nda | Ihene nkuru n'intoya | Kudakura neza, guhitwa, kunanuka, guhinduriza ubwoya, gukorora | Kugira isuku Imiti y'inzoka |
| 2. Ibinwanwa (ibimwete) | Ihene ntoya n'inkuru | Kugira umuriro mwinshi 41°C Urukoko ku munwa ibimwete mu kanwa bishoboka gutuma amara abyimba, bikazana n'ingorane mu guhumeke | Glycerine ivanze na iode kuri ¼ bogesha ibimwete, gutera antibiotiques Gukingira |
| 3. Muryamo y'amatungo magufi yuza PPR | | | |
| 3. Ruhaha | Ihene nkuru n'intoya | Kugira umuriro mwinshi 41°C gukorora, gupfuna ibimyira bivanze n'amashyira guhumeke nabi, guhirita, kutabasha kugenda, umutima ugatera cyane | Gukingira antibiotiques |

UBWOROZI BW'INTAMA



1. Ikiraro

1.1. Uko ikiraro kigomba kuba kingana

- Inyagazi y'intama iri kumwe n'abana bayo kugeza bacutse ikenera ahantu hafite m^2 1,5
- Isekurume y'intama bayigenera m^2 2
- Umwana w'intama ufite munsu y'amezi 8 agenerwa m^2 0,7

2. Kororoka

- Ku ntama 100 zimye, habyara 85;
- Ku ntama zibyara, havuka abana 140 ku nyarwanda, 180 ku za kijyambere;
- Intama ibangurirwa bwa mbere imaze amezi 8 ivutse, icyo gihe iba ifite ibiro hafi 23 ku za kijyambere, na 12 ku Nyarwanda;
- Isekurume imwe ihagije inyagazi 50, igatangira kwimya ifite amezi 15 ivutse;
- Intama ihaka iminsi 149-152 (amezi 5);
- Yonsa amezi atatu, ishobora rero kubyara buri mezi 9 iyo yorowe kijyambere;
- Intama iba ishaje iyo imaze imyaka 6-7 ivutse iba itangiye gukuka amenyo);
- Bahita bayikura mu bworozi.

3. Igaburo

- Intama itungwa n'ibyatsi ;
- Iyo ihaka ni byiza kuyongerera igaburo. Bayiha imvange gr 100-150 ku munsu (mu mezi abiri ya nyuma). Bituma ibyara banini kandi na yo igakomeza kuba nziza. Iyo yonsa bayiha gr 300-400 ku munsu bakurikije umubare w'abana ;
- Isekurume bayiha gr 300 z'imvange iyo yimya ;
- Iyo zicutse, intama baziha gr 50-100 z'imvange ku munsu.

4. Umusaruro

- Intama iyo ibazwe, itanga inyama mu rugero rwa 48% kugeza 50% ku zimeze neza.

5. Indwara z'intama n'uburyo bwo kuzirwanya

| Indwara | Ikigero cy'intama zifatwa | Ibimenyetso | Uburyo bwo kuzirwanya |
|------------------------------|-----------------------------------|---|---|
| 1. Inzoka zo mu nda | Intama ntoya n'inkuru | Guhitwa, kunanuka, kudakura neza, gukorora | Imiti y'inzoka Kugira isuku |
| 2. Ibivumvuri byo mu gihanga | Intama nkuru | Kuzengerera, kubyimba mu gihanga | Kurwanya isazi |
| 3. Ibinwete (ibinwanwa) | Intama ntoya cyane cyane n'inkuru | Kugira ibikoko ku munwa ; Kubyimba mu kanwa kugakurikirwa no kubyimba amara n'ibibazo byo guhumeka | Glycérine ivanze na iode kuri ¼ Gutera antibiotiques |
| 4. Ibisebe byo mu binono | Intama nkuru n'intoya | Uruhu rwo hagati y'ibinono rureruruka bikanuka cyane, hakazamo ikibyimba urwara rukavaho | Koza mu kinono na antiseptique Gutera antibiotiques |

UBWOROZI BW'INKWAVU

1. Aho ziba

- Akazu inkwavu zibamo kagomba kuba nibura kicaye kuri cm 75 uvuye ku butaka.
- Agasanduku kagomba kuba gafite : ibipimo bikurikira :
 - Uburebure : m 1
 - Ubugari : cm 75
 - Ubuhagarike : cm 55
- Abana 6 bamaze gucuka
 - Uburebure : cm 90
 - Ubugari : cm 70
 - Ubuhagarike : cm 55
- Inkwavu zikunda ituze, cyane cyane mu gihe cyo kubangurira, guhaka no kubyara.

2. Kororoka

- Urukwavu rubangurirwa bwa mbere rumaze amezi 7 ruvutse;
- Urw'urugabo rushobora gutangira kwimya kare, ariko ibyiza ni uko rwatangira rufite amezi 8 ruvutse;
- Imfizi imwe ihagije ingore 10, kandi bikwiriye ko itakwimya ingore zirenze 3 mu cyumweru.
- Urukwavu ruhaka iminsi 30-32;
- Hasigaye iminsi itatu ngo rubyare, ni byiza gushyira mu kazu karwo agasanduku ko kuzabyariramo. Urukwavu rugiye kubyara rwipfura amoya rutegura aho ruzabyarira;
- Abana b'urukwavu batangira kureba bamaze iminsi 12 bavutse;
- Batangira kurya bamaze iminsi 18. nyina ibonsa rimwe mu munsu. Ikabonsa iminota 3-5 gusa;
- Inkwavu zicuka zimaze amezi 2 iyo zirya ibyatsi gusa. icyo gihe nyina ishobora kubyara inshuro 3 mu mwaka;
- Iyo zirya n'imvange y'ifu (zihaka, zonsa) urukwavu rucukira iminsi 35-42. Rushobora rero kubyara 5 mu mwaka rugacutsa abana 30;
- Iyo hasigaye icyumweru ngo abana b'inkwavu bacuke, bakuramo ka gasanduku kugira ngo zibanze zimenyere kuba mu kazu katarimo ako gasanduku;

- Iyo urukwavu rumaze imyaka 2,5-3, ruba rushaje, bagomba kuruvana mu bworozi ;
- Hari n'izindi mpamvu zituma baruvanamo : iyo rubyara abana batarenze bane, iyo rukunda kuramburura, no kubyara abana bapfuye.

3. Igaburo

- Urukwavu rugomba kubona amazi n'ibyatsi bihagije;
- Rushobora kurya kg 2-2,5 z'ibyatsi ku munsu bashyira mu byo kuriramo kitegeranye n'icyarire;
- Ariko umuntu ashoboye kurwongereraho n'imvange byaba byiza :
 - Ukwezi kumwe rucutse : gr 50 ku munsu
 - Amezi abiri rucutse : gr 75 ku munsu
 - Amezi atatu rucutse : gr 100 ku munsu
 - Urukwavu rutegereje kwima : gr 100 ku munsu
 - Urukwavu rwonsa gr 300-400 (biterwa n'umubare w'utwana twonka).

4. Umusaruro

- Iyo inkwavu zirya ibyatsi gusa zishobora kugira kg 2 zimaze amezi atanu (ubwoko bwa kijyambere).
- Iyo zirya imvange y'ifu zipima kg 2 zimaze amezi 3,5-4 zivutse
- Urukwavu rwa kinyarwanda rurya ibyatsi gusa rushobora kugira kg 2 rumaze amezi 7
- Iyo rubona imvange rugira ibyo biro rumaze amezi 4,5-5
- Urukwavu rutanga inyama zingana na 60% z'ibiro byarwo ari ruzima.

5. Indwara z'inkwavu

| Indwara | Ikigero cy'inkwavu zifatwa | Ibimenyetso | Uburyo bwo kuyirwanya |
|--------------------------|-------------------------------------|---|--|
| 1.Umuzimire (coccidiose) | Inkwavu ntoya ni zo zikunda gufatwa | Guhitwa cyane bituma inkwavu zumirana ziga-hita zipfa iyo hafashwe amara. Gutumba iyo hafashwe umwijima | Imiti irwanya umuzimire, Amprolium Ferazolidone Kugira isuku y'aho ziba, n'ibyo ziriramo |
| 2. Ubuheri bwo mu matwi | Inkwavu zose | Gucurika amatwi arwaye, kubyimba imiheha y'amatwi no kugira urukoko mu matwi | Gukuraho urukoko, koza n'isabune n'amazi y'akazuyazi no gushyiramo umuti wica udukoko (nka crésyl) uvanze n'amavuta. Benzoate du Benzyl |

UBWOROZI BW'INZUKI (UBUVUMVU)



1. Akamaro k'ubworozi bw'inzuki

- Inzuki zibangurira indabo zihoramo, bityo umusaruro ukomoka ku buhinzi ukiyongera
- Inzuki zitanga ubuki, bukaba bufitiye imibiri y'abantu akamaro kanini kuko burimo intungamubiri nyinshi zitera ingufu (79% z'isukari mu buki) kandi buvura n'indwara nyinshi.
- Ubworozi bw'inzuki bushobora gukorerwa ahantu hadahingwa, busaba amafaranga y'igishoro make ariko bugatanga inyungu nini kandi ntiburushya ubukora.
- Ibishashara bishoboka kuvamo buji (bougies), siraje (cirages) n'ibindi.

2. Uruvumvu

Uruvumvu rushobora kujyamo imizinga mike cyangwa myinshi kandi rukayirinda ibihe bibi (izuba, imvura, umuyaga), rugashyirwa ahantu kure y'ingo n'inzira y'abagenzi n'amatungo, ahantu hatari mu kibaya mu gishanga kandi hadakonja.

Ibyiza ni ukurushyira mu ishyamba (ry'inturusu) cyangwa hafi yaryo kandi rukazitirirwa na senyenge. Imizinga igomba guhora isukurwa bavanaho ubwatsi mu mpande z'uruvumbu kugira ngo intozi zitinjira mu mizinga.

Imizinga igomba gusurwa kenshi guhera sa kumi n'ebiyi kugera saa yine mu gitondo, no guhera saa kumi kugera saa kumi n'ebiyi ni mugoroba kandi bigakorwa vuba mu gihe gito.

3. Uko imirimo y'inzuki ikorwa mu mwaka

Iyo mirimo yigabanyijemo ibice bibiri: imirimo ikorwa igihe hariho ubuki bw'inshi n'ikorwa igihe butariho.

3.1. Imirimo y'igihe hariho ubuki bwinshi

Icyo gihe inzuki ziraboha, urwiru rurabyara cyane bigatuma n'inzuki zica. Ubuki buba buriho muri Kamena, Nyakanga, Kanama, Nzeri, Ukwakira, Gashyantare na werurwe.

Icyo gihe:

- Guhakura birashoboka
- Bagereka imizinga iyo zabaye nyinshi
- Baragika kandi bagashyira inzuki mu mizinga
- Barwanya uruco
- Bakoresha akuma kanini kimira urwiru ku mizinga ifite inzuki nyinshi cyane. Ako kuma iyo bagashyize hagati y'isanduku yo hasi n'ingereko yayo babanje kumanura urwiru mu isanduku yo hasi, bitanga umusaruro mwinshi kuko bahakura ubuki gusa mu ngereko nta cyana na kimwe. Urwiru ruguma mu isanduku yo hasi, intazi zo zigahitamo zikajya mu yo hejuru.

3.2. Imirimo y'igihe ubuki butariho

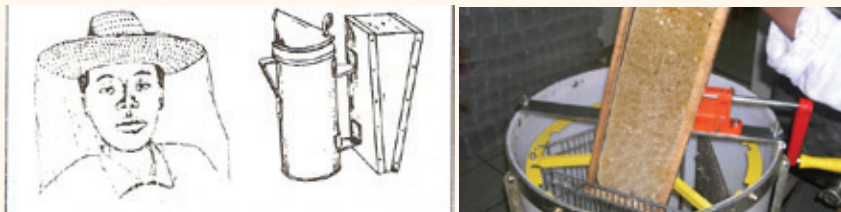
Icyo gihe inzuki ntiziboha, urwiru na rwo rugabanya kubyara bigatuma inzuki zigabanuka mu mizinga, zimwe ndetse zikaboneranwa n'ibyonyi. Ubuki buba buke muri Mutarama, Mata, Gicurasi, Ugushyingo n'Ukuboza.

Icyo gihe:

- Ni bibi guhakura
- Nta kugereka ahubwo bagerekura imizinga irimo inzuki nke zidakwiriye ingereko
- Kirazira kwagika cyangwa gushyira inzuki mu muzinga udafite icyo uzigaburira, birumvikana ko nta ruco ruboneka
- Barwanya ya ndwara y'ikinya
- Akuma kanini kimira urwiru ntibashobora kugakoresha ahubwo bagakura ku mizinga bagashyizeho.

4. UMUSARURO

Mu turere inzuki zeramo neza, umuzinga wa kijyambere w'ubwoko bya Langstroth ushobora kwera kg 50 kugera kuri 70 z'ubuki, naho uwa gihanga ukera kugera kuri kg 10 gusa.



Ubwoko bw'inzuki buboneka mu Rwanda

Hari ubwoko bwinshi bw'inzuki ariko izikunze kuboneka mu Rwanda zirimo amoko atatu ari yo aya akurikira:

INYENZI (apis mellifera adansonii)

Ni inzuki z'umuhondo zitagira amahane kandi zitanga umusaruro utubutse. Ku mubiri warwo hagaragara uduce dutatu tubanza dusa nk'umuhondo naho uduce dutatu duhera ni umukara ; hagati y'agace n'akandi hari ibara rito ry'umuhondo ; ni zo nzuki zikunda kuboneka mu Rwanda kandi abavumvu barazikunda kuko zororoka cyane kandi zigatanga umusaruro utubutse.

INGINA (apis mellifera intermissa)

Ni inzuki zigira amahane cyane zikarangwa no kugira umusaruro muke. Ku nda yazo, hagaragara uduce dutatu twa mbere tw'umuhondo uruta uw'inzenzi naho utwa nyuma tukaba umukara kandi hagati y'agace n'akandi hagasa n'ikigina.

INYUMBU (apis mellifera unicolor)

Ni inzuki zisa n'umukara zigira amahane cyane, zikarangwa n'umusaruro uringaniye. Izo nzuki ni ubwoko bw'utuyiki duto tw'umukara hose ndetse n'urwiru ruba ari umukara.

Ikigamijwe mu gusura umuzinga

Iyo umworozi w'inzuki asura umuzinga akenshi aba agamije kugenzura no kwita kuri bimwe muri ibi bikurikira:

- Gushaka urwiru no kureba ko rutera amagi neza no kurusimbuza igihe rushaje
- Kureba niba inzuki zifite ibizitunga bihagije (ubuki n'intsinda)
- Kuzigaburira
- Kugenzura niba nta byonnyi bibangamiye inzuki mu muzinga, indiririzi cyangwa izindi ndwara
- Kugenzura ubwiyongere bw'inzuki bityo bakagerereka cyangwa se bakagerukura
- Kongerera ingufu irumbo
- Kugereka no kugerekura imizinga
- Gusimbuza amakaderi ashaje
- Kubuza inzuki guca
- Kureba ko harimo ubuki ngo buhakurwe
- Guhoma imyenge itari ngombwa
- Gusimbuza ibishashara bishaje



Ni ngombwa gusura imizinga kugira ngo ugenzure imikorere y'inzuki cyangwa umenye ibibazo zifite (ifoto ya mbere). Ifoto ya kabiri n'ya gatatu zirerekana ibinyagu byuzuye innyo ziteguye kuvuka zikavamo inzuki, ubonye ikadere imeze kuriya wakwemeza ko urwiru ruri mu muzinga rutera neza .

Uko borora inziru

Iki gendererwa n'ukubona inzuki zibasha kw'ihanganira indwara, zidakunda guca kandi zitanga umusaruro uhagije.

Ubu buryo bwibanda ku bikorwa by'ingenzi bikurikira :

- Guhitamo imizinga itanga umusaruro mwinshi, ifite inziru nziza, rumwe rugatanga innyo zizifashishwa , undi ugatanga mpugu zizifashisha mu kubangurira inziru
- Gutegura umuzinga ufite mpugu
- Gushaka no gutegura ikadere ifite innyo zikiri nto zitarengeje iminsi itatu
- Gutegura umuzinga uzororerwamo inziru
- Gutegura akazinga gategurirwamo ibangurirwa ry'urwiru

Gutegura akazinga ko kwakira innyo

Uburyo bwo kuvana innyo mu nkongoro zishyirwa muri cupule

Uburyo bwa piking

Ni akuma kabugenewe kagoronzoye umuntu yifashisha azamura innyo mu nkongoro nkuko bigaragara ku ifoto aho abavumvu bari mu gikorwa cyo kworora inziru bari kuzamura innyo bakoresheje picking

Uburyo bwa cupularve

Ni agasanduku gakoze muri palasitike kagizwe n'ibice bitatu ari byo :

Igice cy'inyuma

Igice cy'imbere kimeze nk'inkongoro zo mu kinyagu kandi gifite myenge 110 ishobora kwakira cupule 110 , igice cyo hejuru gifite aho urwiru rusohokera nahandi hagenewe kwinjiramo urwiru.

Akimirizi (grille à reine)



Uburyo cupularve ikoreshwa:

- cupularve bayifatisha ku icadere ku gice cyayo cyo hejuru ,
- cupularve bayishyiraho grille à reine mu gihe cy'amasaha 24,
- nyuma yayo masaha 24 fata urwiru urwunjize muri cupularve hanyuma ukayifunga ,
- nyuma y'amasaha 12 uvana urwiru muri cupularve rugasubizwa mu muzinga niyo rwaba rutateye muri cupule zose,
- subiza cupularve mu muzinga utegereze ko amagi ahindurwa innyo,
- nyuma y'amasaha 36 shyira cupule kuri porte cupule zo ku macadere no kuyinjiza mu kazinga gatoya , nyuma ya'amasaha atatu umuvumvu areba innyo zakiririwe,
- umuvumvu afata porte cupule ifite inyo zakiririwe akazishyira kuri porte porte cupule yarangiza agashyira ya kadere mu muzinga wokwororeramo za nziru.



Umuvumvu ategura utuzinga two kubanguriramo inziru duhwanye n'umubare w'inziru akeneye.

UBWOROZI BW'AMAFI



Ubworozi bw'amafi bugamije kongera umusaruro kugira ngo bufashe abanyarwanda kwihaza mu biribwa mu rwego rw'umutekano w'inda.

Mu Rwanda hororwa amafi yo mu bwoko bw'ingege, igihwati, inyamugera n'ingembe.

1. icyuzi cy'amafi

- icyuzi cy'amafi cyubakwa ahantu amazi adashobora kumena ubutaka, haboneka amazi meza kandi ahagije ;
- icyuzi kigomba kugira nibura ari 2 ;
- Uburebure bw'incyuzi mu gice cya ruguru cm 40-cm60 naho aho barobera amafi ni cm 1,10-1,20 ;
- Imirimo ijyanye n'ubwubatsi ikorwa muri Mutarama-Gashyantare, Kamena-Nyakanga.

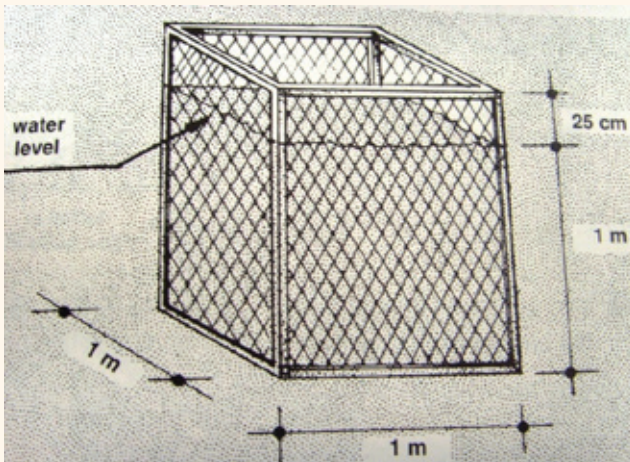
2. Gutera amafi mu byuzi

- Mu cyuzi haterwamo amafi 2 kuri m². Batera amafi muri Werurwe, Nzeli.

1. Kororera amafi muri Kareremba

- Kareremba zishyirwa mu biyaga, mu nzuzi no bizenga by'amazi mu rwego rwo kurinda mafi kugeza asaruwe.
- Amafi yo muri Kareremba agaburirwa ibiryo by'amafi byo mu nganda kugeza igihe cyo kujya ku isoko.
- Ibiyaga n'imigezi myinshi yo mu Rwanda bishobora gukoreshwa mu bworozi bw'amafi muri Kareremba
- Amoko y'amafi aboneka mu Rwanda ashobora kororerwa muri Kareremba

Ifoto ya Kareremba n'ibipimo byayo.



Akamaro ka Kareremba

- Yongera umusaruro w'amafi kugeze ku nshuro 10 – 12 ku mafi yorewe mu byuzi
- Igabanya inagruka ziterwa n'isuru
- Ntizikenera guhinduranya amazi
- Zifasha kororoka kwa Tilapia

2. Imirimo y'ubworozi

- Igihe cy'ubworozi : amezi 6-8 ;
- kugaburira amafi mu gihe cyose ari mu cyuzi ;
- Gufumbira icyuzi: 10% z'ubuso bwacyo, ni ukuvuga ibiro 20 kugeza 50 kuri ari imwe y'icyuzi mu cyumweru ;
- kugenzura ko harimo amazi ahagije ;

- kuroba ibyuzi, kugurisha amafi manini naho amatoya akongera guterwa (Gashyantare, Kanama) ;
- umusaruro: ibiro 20-40 kuri ari imwe.

3. Imirimo yo gufata neza ibyuzi

- Gusana imiyoboro y'amazi
- Gutunganya imigende ikamura amazi
- Gutera ibyatsi birwanya isuri hafi y'ibyuzi
- Kumisha icyuzi nibura iminsi 15 bitewe n'uko igihe cyifashe (Gashyantare, Kanama).

4. Ubworozi bw'amafi n'andi matungo

Uburyo bwo korora ingurube, inkoko, inkwavu cyangwa ibishuhe hejuru cyangwa iruhande rw'icyuzi bituma umusaruro w'amafi wikuba kabiri kubera ifumbire, hakiyongeraho umusaruro ukomoka kuri ayo matungo kandi urondereje ubutaka.

UBUROBYI

Ibisobanuro:

- **Uburobyi** ni uburyo bwo kubyaza umusaruro w'amafi ibiyaga n'ibidendezi kamere ku buryo burambye
- **Imiterere y'uburobyi:** ibiyaga, ibidendezi kamere n'inzuzi bingana na 6 ku ijana by'ubuso bwose bw'igihugu cyose

Mu Rwanda haboneka amoko y'amafi arenga gato mirongo itatu. Amoko ane muri ayo kugeza magingo aya ni yo arobwa ku buryo bugaragara.

Umusaruro w'uburobyi uboneka kugeza ubu mu biyaga, ibidendezi kamere n'inzuzi ugera hafi kuri toni 6 000 ku mwaka hatabarwamo igice cy'umusaruro kiribwa n'abarobyi kimwe n'ikindi gice kigurishwa kitanyuze mu mashyirahamwe y'abarobyi.

Urebye umuntu yavugaga ko umusaruro w'uburobyi waba ukabakaba toni 7 500 ku mwaka.

- **Amoko y'amafi arobwa:** Tilapia, Isambaza, Indugu n'Inkube.
- **Ibikoresho by'uburobyi:** Ubutimba guhera ku gipimo cya 4 ubutimba butegurwa mu irobwa ry'isambaza,
- Palangres, inshundura na masses.
- **Uburyo bwo kuroba bubujijwe:** Amakokoro, ubutimba bufite amaso ari muni ya 4, kukubita amazi kimwe no kurobesha imiti yica amafi.

- **Amategako y'uburobyi:** kuroba mu mazi y'u Rwanda byemererwa gusa abenegihugu n'abanyamahanga batuye kandi bakabarurirwa mu Rwanda. Abo bose bagomba kugira impushya z'uburobyi cyangwa bagakodesha ibikingi by'uburobyi ku buryo bukurikije itegeko rigenga uburobyi.

Impushya zo kuroba ziri muri ibi byiciro.

Icyiciro cya mbere „A“: Uburobyi bw'ikiruhuko bugabanijwemo ibice bibiri:

- A1: Uburobyi bukozwe n'abenegihugu
- A2: Uburobyi bukozwe n'abanyamahanga

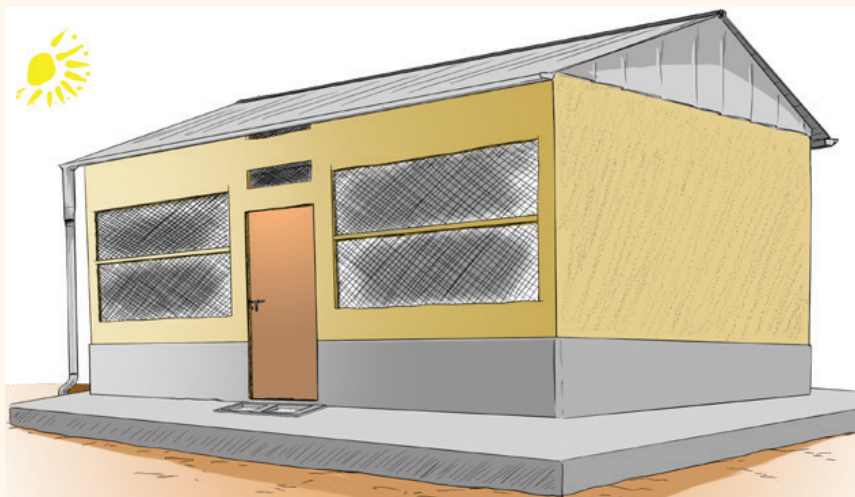
Icyiciro cya kabiri “B”: Uburobyi bw'ubucuruzi

- B1: Uburobyi bukoresha ibikoresho biciriritse nk'inshundura ;
- B2: Uburobyi bukoresha ubutimba butarengeje m 1000 ;
- B3: Uburobyi bukoresha ubutimba buterurwa ;
- B4: Uburobyi bukoresha umukwabu uhindukizwa.

UBWOROZI BW'INKOKO



1. Ikiraro cy'inkoko



Inkoko zigomba kuba ahantu zisanzuye kandi hari urumuri n'umwuka birahagije.

Ikiraro cy'inkoko cyubakwa ahantu hakurikira:

- a. Ahantu humutse
- b. Hafi y'ahantu washobora kubona abakozi no kuyikurikirana byoroshye
- c. Hitaruye nibura metero 800 uvuye ku bindi biraro by'inkoko, kugira ngo hatabaho ikwirakwiza ry'indwara.
- d. Ibi ntibikunze kubaho, ariko biba byiza iyo ikiraro cyitaruye kurushaho
- e. Hitaruye nibura metero 200 y'aho abantu batuye na metero 500 uturutse ku gace gatuwemo.
- f. Hafi y'umuhanda, kugira ngo ubwikorezi bw'ibiryo n'amagi bworohye
- g. Hafi y'amazi n'amashanyarazi

Ibipimo:

- 1 m² ku mishwi 20 (umunsi umwe kugeza ku minsi 30) ;
- 1 m² ku bigwana 10 (ukwezi kugeza ku mezi 5) ;
- 1 m² ku nkokokazi 5 zitera;
- Inkoko zigomba kugira urugo rwo gutemberamo ku zuba. Urwo rugo rugomba kuba ruzitiye kugira ngo zitajya hanze yarwo.

Icyitonderwa: Inkoko zitangana, zitaturutse hamwe, zidahuje ubwoko ntabwo zororerwa mu kiraro kimwe

2. Kororoka

- Inkokokazi itangira gutera imaze amezi 5,5 ivutse ;
- Irarira iminsi 21 ;
- Inkokokazi ishobora gutera idafite isake, ariko igatera amahuri ;
- Isake imwe irahagije ku nkokokazi 10 kugira ngo zitere amagi atari amahuri;
- Inkokokazi imaze umwaka itera igomba kuvanwa mu bworozi.

3. Kugaburira inkoko



- Kugira ngo inkoko zikure neza kandi zitange amagi menshi, zigomba kugaburirwa neza;
- Kugabura neza rero nta kundi ni ugutanga indyo yuzuye, ku kigero cyagenwe kandi yujuje ubuziranenge. Iyo ndyo kandi itangirwa ku gihe cyagenwe, umworozi akagabura akurikije uko inkoko zigenda zikura mu magarama.
- Iyo tuvuga indyo yuzuye tuba tuvuga indyo ibonekamo ibitera imbaraga, ibyubaka umubiri, n'ibirinda indwara. Ibitera imbaraga tubisanga mu binyampeke (ibigori, amasaka, ingano, umuceri, ibisheke,...), ibyubaka umubiri biboneka mu biribwa bikungahaye ku ma poroteyini nka Soya, Indagara, ibihwagari, acide amine :Lysine, Methionone. Naho mu birinda indwara, dusangamo ibiribwa bikungahaye ku myunyu ngugu n' amavitamine nk'amagufa, ibikonoshwa by'ibinyamujonjorerwa, premix, DCP, umunyu wo mu gikoni, n'ibindi.
- Ku bashoboye kubona imvange, dore uko bagomba kuyitanga kuri buri nkoko, ku munsu:
 - Icyumweru cya 1 ivutse: gr 15
 - Icyumweru cya 8: gr 50
 - Icyumweru cya 20: gr 100
 - Icyumweru cya 22: gr 120
 - Inkoko itera: gr 130

4. Umusaruro

Uretse ubwoko bw'inkoko zitera, hari n'ubwoko bw'izitanga inyama, ari bwo bita mu gifaransa "poulet de chair"

- Mu mezi abiri, inkoko y'ubwo bwoko ishobora kuba ipima kg 1,6 itabaze ;
- Iyo ibaze ishobora gutanga umusaruro wa 70% (inkoko ifite kg 1,6 ari nzima itanga kg 1,120 z'inyama) ;
- Inkoko zisanzwe zo, zishobora gutanga umusaruro wa 60% w'inyama ;
- Inkoko yo mu bwoko bwa RIR (Rhode Island Red) ishobora gutera ku mwaka amagi 220 iyo yafashwe neza. Ni ukuvuga umusaruro w'amagi wa 60% ;
- Inkoko yo mu bwoko Derco, iyo ifashwe neza ishobora gutera amagi 250 ku mwaka. Ni ukuvuga umusaruro wa 69% ku mwaka ;
- Hari ubundi bwoko bushobora gutera amagi 300 ku mwaka, aha twavugaga nka Warren ;
- Inkoko isanzwe ya kinyarwanda ishobora gutera amagi 60 kugeza kuri 90 ku mwaka. Mu bwoko bwa kinyarwanda, hagenda habamo zimwe ziba nziza kuruta izindi.

5. Indwara z'inkoko

Inkoko irwaye (ntibasha kurya, iba yigunze, irahagira, ipfuka amababa, irangwa no kwitsamura, gukorora, igira ibimyira mu mazuru, igira amarira mu maso, amatotoro yayo aba ari amazi cyangwa arimo amaraso n'ibindi).



| Indwara | Ikigero cy'inkoko zifatwa | Ibimenyetso | Uburyo bwo kuyirwanya |
|---------------------------|-------------------------------------|---|---|
| 1. Inzoka | Inkoko ntoya cyane cyane | Guhumeka nabi, gufureka, gukura nabi, guhitwa, kwitsamura, kunanuka | Imiti y'inzoka Kugira isuku y'aho ziba n'ibyo ziriramo |
| 2. Umuzimire (coccidiose) | Inkoko ntoya cyane cyane | Guhitwa amaraso, kunanuka bikabije, gupfa ari nyinshi | Kuvuza sulfamides (amprolium) Kugira isuku y'aho ziba n'ibyo ziriramo |
| 3. Umuraramo (umusinziro) | Inkoko ntoya n'inkuru | Guhitwa iby'umweru cyangwa iby'umuhondo, amababa agacurama, inkoko ziriyegegeranya, ntizishobore kugenda, ntizirye, ntizibona ntizibashe guhagarara | Kugira isuku y'aho ziba n'ibyo ziriramo Kuzikingira zikivuka, ku mezi 2 no ku mezi 4 Kuziha sulfamides (Furazolidone) |
| 4. Indwara ya Gumboro | Ibyana by'ibyumweru 3 kugeza kuri 6 | Guhitwa cyane iby'umweru, guhinda umushyitsi, gutumba, kwigunga. Hapfa 10-30% by'izafashwe | Gukingira imishwi |
| 5. Ubushita (Variole) | Inkoko ntoya n'inkuru | Kubyimba amaso n'amazuru no mu kanwa, kuzana uduheri ku ruhu tukazana urukoko. Mu Rwanda indwara ihaboneka ntikanganye | Gutera antibiotiques na vitamine |

UBWOROZI BW'INKOKO Z'INYAMA



- Ni ubworozi bumara igihe kigufi cyane,
- zishobora gutanga umusaruro nyuma y'iminsi mirongwitanu gusa (amezi abiri gusa) .
- icyo gihe inkoko imwe uyibaze, iba ipima ikiro n'igice (1.5kg)

Imishwi y'inkoko z'inyama

- Igomba gushyirwa ahantu hashyushye (ushobora gukoresha imbabura, cyangwa se ampoules z'amashanyarazi).
- Ubushyuhe bugomba kuba buringaniye (32°)
- Mu cyumweru cya mbere imishwi 50 ijya kuri metero kare imwe, ni ukuvuga metero imwe kuri metero imwe.
- Isaso y'inkoko igomba kuba ihagije (ushobora gukoresha ibarizo cyangwa se ibishishwa by'umuceri).

Ibigwana by'inkoko z'inyama

- Ikenera icyo kunyweramo kimwe kijyamo litiro eshatu z'amazi ku nkoko 50 z'imishwi, iyo zikuze hakenewe icyo kunyweramo kimwe cya litiro icumi.
- Zikenera icyo kuriramo kimwe gifite uburebure bwa metero imwe ku mishwi 50,
- zakura zigakenera icyo kuriramo kimwe kijyamo ibiro 20 by'ibiryo.

Gahunda yo gukingira ku nkoko z'inyama

| Iminsi | Indwara ikingirwa | Inkingo | Uko zitangwa |
|--------|--|------------------|----------------------------------|
| 0 | New Castle(ND) +infectious bronchitis(BI Mass) | Cevac Vitabron L | Urukingo rutangirwa mu ituragiro |
| 3 | Infectious bronchitis BI (Variant): | CEVAC Ibird | Mu mazi yo kunywa |
| 7 | GUMBORO (IBDV) | CEVAC Gumbo L | Mu mazi yo kunywa |
| 14 | GUMBORO (IBDV) | CEVAC IBDL | Mu mazi yo kunywa |
| 21 | New Castle (ND) | CEVAC NEW L | Mu mazi yo kunywa |

NB: Izi ngero zishobora guhinduka cyane bitewe n'akarere inkoko zirimo ndetse n'ubwoko bw'inkoko

Ibiryo bikenewe ku nkoko z'inyama

| Igihe imaze (Ibyumweru) | Igipimo cy'Ibiryo (muri garama) | Amazi (ml) | Ubumere bwayo |
|-------------------------|---------------------------------|------------|---------------|
| 1 | 20 | 40-50 | 130-150 g |
| 2 | 30 | 60-80 | 260-300g |
| 3 | 50 | 100-120 | 460-520g |
| 4 | 70 | 140-160 | 750-800 g |
| 5 | 90 | 180-200 | 100-1200 g |
| 6 | 105 | 210-230 | 1300-1500g |
| 7 | 115 | 230-280 | 1600-1800g |
| 8 | 120 | 240-300 | 1900-2100g |
| 9 | 125 | 250-320 | 2100-2300g |
| 10 | 130 | 260-350 | 2200-2400g |

UBWOROZI BW'INKOKO Z'AMAGI



Ifoto y'imishwi y'inkoko z'amagi

Imishwi y'inko z'amagi igomba gushyirwa ahantu hashyushye (ushobora gukoresha imbabura, cyangwa se amashanyarazi). Ubushyuhe bukenewe ku nkoko z'inyama ni nabwo bukenewe ku nkoko z'amagi.

Ibigwana by'inkoko z'amagi

Ni ukwaga ku cyumweru cya cyenda kugeza ku cyumweru cya 20

Ni muri kiriya gihe inkoko zigomba gukurikiranwa, hagakorwa inkingo zose zabugenewe, isuku ikitabwaho ibiryo n'amazi nabyo bikaba bihagije.

Inkoko zitangiye gutera amagi.

- Kuva ku cyumweru cya 20 kugeza inkoko zishaje (hafi ku byumweru 80),
- Mbere y'ibyumweru 2 ngo inkoko zitangire gutera, umworozi agomba gushyiramo udusanduka inkoko zizatereramo kugirango zizatangiye gutera zaratumenyereye.
- Iyo inkoko zatangiye gutera amagi , umworozi agomba kunyura mu nzu y'inkoko nibura incuro enye; mu gitondo mu masaa tatu; saa tanu; saa munani, no ku mugoroba mu ma saa kumi n'imwe, kugirango akuremo amagi inkoko zimaze gutera.
- Gukuramo amagi inshuro nyinshi bituma zitayamena.

Gahunda yo gukingira ku nkoko z'amagi

| Iminsi | Indwara ikingirwa | Inkingo | Uko zitangwa |
|-------------|---|--|----------------------------------|
| 0 | Marek | CEVAC MD HVT RISPENS | Urukingo rutangirwa mu ituragiro |
| 3 | New Castle(ND) +infectious bronchitis (BI(mass)+BI(variant)) | CEVAC BI L + CEVAC Ibird | Mu mazi yo kunywa |
| 7 | GUMBORO (IBDV) | CEVAC Gumbo L | Mu mazi yo kunywa |
| 14 | GUMBORO (IBDV) | CEVAC IBDL | Mu mazi yo kunywa |
| 21 | New Castle (ND) | CEVAC NEW L | Mu mazi yo kunywa |
| 25 | GUMBORO (IBDV) | CEVAC IBD L | Mu mazi yo kunywa |
| 35 | New Castle (ND) | CEVAC NEW L | Mu mazi yo kunywa |
| 45 | FowlPox (FP) | CEVAC FPL | Ruterwa mu ibaba |
| 56 | New Castle (ND) | CEVAC NEW L | Mu mazi yo kunywa |
| 70 | New Castle(ND) +infectious bronchitis(BI Mass) | CEVAC NEW L + CEVAC BRON L Cyan- gwa (CEVAC NBL) | Mu mazi yo kunywa |
| 91 | New Castle (ND)+infectious bronchitis BI(Variant) | CAVAC NEW L + CEVAC Ibird | Mu mazi yo kunywa |
| 112 -119 | New Castle(ND) + infec- tious bronchitis(BI) + Egg-drop syndome(EDS)+ coryza(ABC) +salmonella Enteritidis | Cevac Corymune 7k | Ruterwa mu nyama |
| 196 | New Castle (ND)+ infectious bronchitis(BI Mass) | CEVAC NEW L + CEVAC BRON L Cyan- gwa CEVAC NBL | Mu mazi yo kunywa |
| 245 | New Castle(ND)+ infectious bronchitis BI(Variant): | CEVAC NEW L + CEVAC Ibird | Mu mazi yo kunywa |
| 385 | New Castle (ND)+ infectious bronchitis BI(Variant) | CEVAC NEW L + CEVAC Ibird | Mu mazi yo |

Ibiryo bikenewe ku nkoko z'amagi

| Imishwi y'iz'amagi | | |
|---------------------------------|--------------|------------------|
| Ibigize ibiryo | Ijanisha (%) | Ingano (1000 Kg) |
| Ibigori | 29 | 290 |
| Ibisigazwa by'ibigori (Buranda) | 40 | 400 |
| Indagara | 6 | 60 |
| Kokiye | 4 | 40 |
| Ibisigazwa bya Soya | 8 | 80 |
| Ibihwagari | 8 | 80 |
| Concentrate/Premix | 5 | 50 |
| Igiteranyo | 100 | 1000 |

| Ibigwano by'iz'amagi | | |
|----------------------|--------------|------------------|
| Ibigize ibiryo | Ijanisha (%) | Ingano (1000 Kg) |
| Ibigori | 30 | 300 |
| Buranda | 35 | 350 |
| Indagara | 7 | 70 |
| Kokiye | 5 | 50 |
| Soya | 10 | 100 |
| Ibihwagari | 8 | 80 |
| Concentrate/ Premix | 5 | 50 |
| Igiteranyo | 100 | 1000 |

| Izitera amagi | | |
|---------------------|--------------|------------------|
| Ibigize ibiryo | Ijanisha (%) | Ingano (1000 Kg) |
| Ibigori | 25 | 250 |
| Buranda | 43.5 | 435 |
| Indagara | 8 | 80 |
| Kokiye | 6 | 60 |
| Ibisigazwa bya Soya | 7 | 65 |
| Ibihwagari | 6 | 60 |
| Concentrate /Premix | 5 | 50 |
| Igiteranyo | 100 | 1000 |

Izibagwa: muni y'iminsi 28

| Ibigize imvange | Ijanisha (%) | Ingano (1000 Kg) |
|------------------------|---------------------|-------------------------|
| Ibigori | 64.00% | 640 |
| Buranda | 9.00% | 90 |
| Indagara | 2.50% | 25 |
| Soya | 16.00% | 160 |
| Moringa | 2.00% | 20 |
| Ishwagara | 0.50% | 10 |
| Amavuta ya soya | 1.00% | 5 |
| Concentrate /Premix | 5.00% | 50 |
| Igiteranyo | 100.00% | 1000 |

Ingengabihe y'ubworozi , Gahunda z'ibikorwa by'ingenzi muri buri gihembwe

| | | Ibihe (TIME PERIOD) | | | | | | | | | | | |
|--|---|---------------------|-----|-----|-----|-----|-------------------|-----|-----|-----|------|-----------------|-----|
| | | Umuhindo (Season A) | | | | | Itumba (Season B) | | | | | Icyi (Season C) | |
| | Igikorwa gikenewe (REQUIRED ACTIONS) | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | June | July | Aug |
| Girinka | Kwemeza urutonde rw'imiryango izorozwa | ■ | | | | | | | | | | | |
| | Gutegura aborozi | ■ | ■ | ■ | | | | | | | | | |
| | Gutanga inka zihaka | | ■ | ■ | ■ | ■ | | | | | | | |
| | Gukurikirana inka zatanzwe | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Gutegura ubwatsi bw'amatumungo | Igikorwa gikenewe (REQUIRED ACTIONS) | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | June | July | Aug |
| | Gutanga imbuto z'ubwatsi (via MCCs, Imirenge) | ■ | ■ | | | | ■ | ■ | | | | | |
| | Gutera ubwatsi bw'amatumungo ahasoboka hose (ku miringoti, hagati y'imirima, mu dushyamba, imibande no hagati mu nsina) | ■ | ■ | ■ | | | | | ■ | ■ | | | |
| | Kuvugurura no gushyira ifumbire ku bwatsi busanzweho | ■ | ■ | ■ | | | | ■ | ■ | | | | |
| | Kuvugurura inzuri | ■ | ■ | ■ | | | ■ | ■ | | | | | |
| | Guhunika ubwatsi | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Kuvugurura amatungo | Public awareness | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Campaign AI ku nka za Girinka | | ■ | ■ | | | | | | | | | |
| | Kugeza ibikoresho kubatera intanga | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| | Ibarura ry'inyana zivuka kuri AI | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| | Public awareness | ■ | | ■ | | | | | | | | | |
| Ubuzima bw'amatumungo | Gukingira LSD | | ■ | ■ | | | | | | | | | |
| | Gukingira Brucellosis | | ■ | ■ | | | | | | | | | |
| | Gukingira ubutaka | | ■ | ■ | | | ■ | ■ | | | | | |
| | Gukingira Rift Valley fever (Dec - Jan) | | | | ■ | ■ | | | | ■ | ■ | | |
| | Kubakisha impangu mu Tugari | ■ | ■ | | | | | | | | | | |
| | Gufuhera amatungo: Nibura rimwe mu cyumweru | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Gukingira inyana indwara y'amakore buri gihe inyana igejeje ku amezi 5-11 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | Gukingira ikibagarira (igihe cyose ariko byiza kubikora mu gihe kitari cy'impehyi) | ■ | ■ | ■ | ■ | | | ■ | ■ | | | | |
| | Gukingira inkoko (Igihe cyose imishwi yaguzwe, calendar y'uko izajya ikingirwa kuva ku muni wa mbere iri ku mugereka) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Gukingira indwara y'ibisazi mu mbwa n'injangwe | | | | ■ | ■ | | | | | | ■ | ■ | |

