



## **IMFASHANYIGISHO YA 06: UBURYO BUKOMATANYE BWO KURWANYA INDWARA N'IBYONNYI**

Kurwanya indwara ni ibyonnyi ni igikorwa cy'ingenzi mu buhinzi bwa kawa kugirango umusaruro wiyongere mu bwinshi no mu bwiza. Indwara z'ingenzi ziboneka mu Rwanda ni: Umugese, Akalibata na gikongoro ndetse ikagira n'ibyonnyi bitandukanye, iby'ingenzi akaba ari Agasurira, Ibishorobwa n'imungu. Kurwanya indwara ni ibyonnyi bisaba umuhinzi gufata umurima we neza nko kubagara, gukata ikawa, gusasira, gufumbira no gutera imiti.

**Indwara** ni ingaruka mbi ku mikorere y'ibice bigize kawa biturutse mikorere mibi y'udukoko duto cyane tutereshwa amaso nk'udukoko, bacteria cyangwa virus, bigatuma amababi, amashami cyangwa imbuto byangirika, bikagabanya umusaruro n'ubwiza bw'ikawa

**Ibyonnyi**, ku rundi ruhande, ni udukoko cyangwa inyamaswa bigaragara byangiza ibice by'igiti cy'ikawa, nk'udukoko, utumaturizi, imungu ya kawa n'inkangabashi, bigatera igihombo.

### **Kugenzura indwara n'ibyonnyi n'inshuti z'abahinzi mu murima wa kawa**

Kugenzura umurima no gusuzuma indwara mu ikawa bifite akamaro kanini kuko bifasha gutahura indwara n'udukoko hakiri kare, bikarinda ikwirakwira ryabyo mu murima wose, bikagabanya igihombo ku musaruro n'ubwiza bw'ikawa. Ibi bituma umuhinzi afata ibyemezo bishingiye ku makuru nyayo, akavura aho bikenewe gusa, bityo akagabanya ikiguzi cy'imiti no kurengera ibidukikije. Gusuzuma kenshi kandi bituma ikawa igumana ubuzima bwiza, igatanga imbuto nziza kandi nyinshi, bikongera amahirwe yo kubona isoko ryiza n'inyungu zirambye ku muhinzi.

**Gusura no gukurikirana ibiti bya kawa mu murima** bikorwa ugenda mu murima wose usuzuma ibiti byatoranyijwe mu bice bitandukanye kugira ngo hamenyekane uko ibiti bihagaze mu buryo butandukanye. Ku giti cyatoranyijwe, usuzuma niba harimo ibyonnyi nk'udusurira, inkangabashi, imungu y'ibitumbwe bya kawa, ndetse n'ibimenyetso by'indwara nk'umugese w'amababi, indwara y'akaribata. Muri icyo gihe kandi, wandika niba hari udukoko tw'ingirakamaro nka **uruvu, urutambara, nriramabara, utuvubi n'ibitagangurirwa**. Dufasha mu kugenzura udukoko twangiza ibiti mu buryo bw'ibinyabuzima. Ibyo ubona byose bigomba kwandikwa neza, harimo ubukana n'uburyo byakwirakwiye, kugira ngo bifashe gufata ibyemezo ku gihe no mu buryo bukwiye mu guhangana n'indwara n'udukoko.

## Indwara n'ibyonnyi bikunda kuboneka mu ikawa

### <Ibyonnyi>

#### 1) Uduhunduguru n'utumatirizi



Ni udusimba duto twonka amashami n'amababi bya kawa bikiri bito byoroshye. Tunyunyuzamamatembabuzi ya kawa maze igiti cya kawa kigacika intege.

Tera umuti mu buryo butoranya: Niba uturiyari twinshi cyane mu murima wawe, vanga amavuta yo guteka

n'isabune y'amazi (nka teepol) maze ugende utera ahari uturiyari gusa. Ibi ntibizica udukoko dukenewe. Urugero rwo kuvanga ni mililitiro 100 z'amavuta na mililitiro 50 z'isabune muri litiro 16 kugeza kuri 20 z'amazi.

#### 2) Imungu ya Kawa



Mu Rwanda, icyo cyonnyi 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. Imungu y'ikawa ituma umusaruro ugabanuka kandi ugatakaza ubwiza bwawo bityo bigahombya umuhinzi. Imungu nkuru iba ari umukara. Nta kintu byamara ku mungu z'ibitumbwe gutera imiti yica udukoko, kuko ziba imbere mu bitumbwe. Iyi miti ahubwo izica udukoko dukenewe

## Uburyo bwo kurwanya imungu y'ikawa

### a) Gufata neza umurima

- 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 hanyuma ubisarure ubitwike.
- Gusarura kawa zose z'imburagihe no kubitwikira kure y'umurima kugirango uhagarike ikwirakwira kw'imungu
- Kuvanga ibiti by'ikawa n'ibiti bitanga igicucu aribyo Alnus, Calliandra, Leuceana kugirango hororoke udusimba turya imungu y'ikawa (inshuti z'abahinzi).
- Gusoroma ibitumbwe byose byafashwe n'imungu no kubitwikira kure y'umurima kugirango uhagarike gukwirakwira kw'imungu z'ikawa.
- Kata ikawa yawe hagati ya Kamena na Kanama uvanaho ibisambo byose biri kuri buri giti cy'ikawa.

b) **Koresha imitego:** Wifashishije icupa rya pulastike cya litiro 1, 2 ccyangwa 5. Urisige



irangi ritukura, urikatemo amadirishya atatu, imbere ushyiremo akandi gacupa gato karimo alcohol/inzoga /ubushera cyangwa urwagwa.

- Zirika umugozi ku gacupa gato gateretse mu icupa rinini
- Suka amazi mu icupa rinini azenguruke kagacupa gato karimo alcohol
- Pfumura mu mupfundikizo w'icupa rinini ucishemo

umugozi uziritse agacupa gato hanyuma upfundikire neza ryacupa ariko umugozi ugaragara hejuru

- Manika iryo cupa mu ishami ry'igiti kuburebure bwa ml-1.5
- Shyira umutego umwe mubiti 50 by'ikawa.

Imungu iza ikurikiye impumuro n'ibara ritukura kuko biyimerera nk'igitumbwe cya kawa gihishije. Nyuma yo guhumeka arukoro, irasinda ikagwa mu mazi igapfa/

### 3) **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, cyirihho insharankima, hagati y’iminsi 10-12



Imyobo yacukuwe  
N’igishorobwa



amagi yituragamo utunyo twumweru tugatangira guharagata igishishwa cy’igiti tukinjira imbere mu giti. Iki gishorobwa cyangiza gihereye imbere mu nsibo

- **Inkangabashi y’umweru. (Igishorobwa 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 rwabayeho inkangabashi, icukura umwobo wa cm 1 igasohoka igakomeza kuzunguruka mu gipimo cya kawa itera amagi

- **Inkangabashi nkuru. Ikivumvuri**



**Inkangabashi y’umuhondo** igira ibara rya orange, itera amagi ku giti cya kawa maze utunyo tuvuyemo tukazamuka dushakisha ahoroshye twakwinjirira. Twinjirira hejuru ku gashami kakiri gato koroshye gupfumura. Gapfumura utwobo duto cyane kandi twinshi dushoreranya ku giti uva hejuru ujya hasi. Ifu imeze nk’ibarizo uyisanga hasi hafi y’igiti



### **Igiti cyangijwe n'inkangabashi y'umuhondo**

**Ikivumvuli** gicukura umwobo ucuramyeye ku ruti rwa kawa hejuru ya cm 50 kikagenda kizamuka mu ruti, iyo bicukuye bihungurira hasi ifu imeze nk'ibarizo. Ari inkangabashi cg ibivumvuli byombi bituma amababi y'igiti aba umuhondo, akagwa hasi, uretse koi bi bimenyetso bishobora no guterwa n'ibindi bibazo

### **Kurwanya Inkangabashi n'ibivumvuli**

Kubirwanya ni umurimo utoroshye ariko icyiza ni ugufata neza umurima wa kawa kuko ibi byonnyi bikunze gufata ibiti bishaje kandi bidakorerwa isuku.

- i. Isuku ku giti (gukuraho insharankima) ukoresha ibikoresho bidakomeretsa igiti. icyo gihe ibyo byonnyi ntibibona aho biterera amagi
- ii. Gufata neza igipimo cya kawa (gufumbira no gusazura igihe ibiti bishaje)
- iii. Gucengeza urutsinga mu mwobo wacukuwe n'igishorobwa kugirango ukice.
- iv. Ibishorobwa bikunda ahantu hashyuha niyo mpamvu gutera ibiti bitanga igicucu mu ikawa bigabanya ibyo bishorobwa
- v. Gukoresha umuti wica utwo dusimba ukoresheje ipamba ririho umuti ukaryinjiza mu mwobo wacukuwe mu ruti rw'ikawa n'igishorobwa

#### 4) Agasurira

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, munsu y’amababi no hagati y’imbuto nyinshi z’ikawa. Ako gasimba kandi gakunze gutera amagi munsu y’ikibabi cya Kawa.



Ifoto y’agasurira n’amagi yatwo

#### Uko agasurira kangiza

- **Kwonona imbuto z’ikawa:** Antestia icukura ikananyunyuzwa amazi ari mu mbuto z’ikawa zitarakura neza cyangwa zeze. Ibi bitera utudomo tw’umukara, imbuto zigashirirana kandi rimwe na rimwe zikagwa mbere yo kwera.
- **Kwangiza ubuziranenge bw’ikawa:** Mu gihe irya imbuto, antestia yinjiza udukoko duta (microorganisms) dutera indwara yitwa “potato taste defect (PTD)”, igatuma ikawa igira impumuro n’uburyohe bubi, bigabanya agaciro kayo ku isoko.
- **Kwonona indabo n’udushami duta:** Iyo antestia ari nyinshi, ishobora no kwangiza indabo n’udushami dukiri duta, bigatuma igabanuka ry’imbuto zifatika.
- **Kugabanya umusaruro:** Kurya gukomeje gutuma igiti cya kawa kigira intege nke, bikagabanya umusaruro n’ubwiza bw’imbuto.



## Uburyo bukomatanyije bwo kurwanya agasurira

### A) Gufata neza umurima

- 1) Gukata kawa kugirango urumuri rwiyongere mu giti, agasurira kabure aho kihisha, kandi bitume imiti ikwirakwira neza mu mashami.
- 2) Gusuzuma umurima kenshi, gutoragura udusurira n'amagi yatwo bikicirwa kure y'umurima
- 3) Niba ubonye udusurira 2-3 ku giti, tegura ako kanya uburyo bwo gutera umuti wica udusurira
- 4) Kwirinda kwica udusimba turya agasurira mu mirima (inshuti z'abahinzi), nk'uruvu, amavubi, urutambara n'utundi....)

### B) Gutera imiti

Gutera imiti yica agasurira kandi itangiza ibidukikije. Imiti iterwa mbere yo gusarura kugira ngo hirindwe ko ubukana bw'imiti bujyana n'ibitumbwe mu gihe cy'isarura. Mbere yo gutera umuti uwo ari wose, umuhinzi asabwa kubanza kugisha inama ababishinzwe (ba Agronomes n'abafashamyumvire kuko imiti yica agasurira igenda isimburana buri mwaka

#### 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.
- Koresha umuti wica udusurira gusa wemewe mu ikawa.

#### <Indwara>

### 1) Umugese

Umugese w'ikawa uterwa n'uduhumyo twitwa "*Hemileia vastatrix*" Iyi ndwara igaragara cyane mu gihe cy'izuba by'umwihariko mu mpeshyi n'urugaryi no mu turere dufite ubutumburuke buri hasi./ Coffee leaf rust is caused by a fungus called *Hemileia vastatrix*. This disease occurs mainly during the dry season, especially in the short dry season and the long dry season, and is more common in low-altitude areas.

### **Ibimenyetso**

Imenyekanira ku tudomo tw'ifu y'umuhondo iboneka ku ruhande rwo hasi rw'ikibabi cy'ikawa.



### **Amababi ariho ibimenyetso by'umugese**

Igihe kiragera ibibabi byafashwe bigahunguka bikagwa hasi, bityo amashami y'ikawa akuma. Umugese ukwirakwizwa cyane n'umuyaga ariko n'abantu ubwabo ndetse n'ibikoresho bashobora kuwukwirakwiza igihe bagendagenda mu gipimo kuko kariya gafu gashobora gufata ku myenda no ku mubiri bityo bakaba bagasiga ku mababi atarwaye akandura atyo. Muri rusange iyo utudomo tubiri (2) tw'umugese tugaragaye ku kibabi kimwe, umuhinzi akwiriye gutangira kuyirwanya.

### **Uburyo bwo kurwanya umugese**

#### **A. Gufata neza umurima**



- Ikawa igomba guterwa nibura kuri 2m hagati y'umurongo n'undi na 2m hagatiy'ikawa n'indi
- Gukoresha ifumbire y'imborera n'imvaruganda bihagije kandi ku buryo buhoraho byongerera ikawa ubudahangarwa
- Kubagara igipimo no kugisasira bihoraho nabyo byongerera ikawa ubudahangarwa
- Ni byiza gukura ibisambo no kugabanya amashami ku ikawa kugirango uduhumyo tutabona ahantu heza ho korokera kandi n'umuti ushobore kugera ku mababi yose igihe bibaye ngombwa ko bawutera
- Gutera ibiti bitanga igicucu mu gipimo cya Kawa
- Ni byiza gutera imbuto zitarwara (zihanganira umugese) nka RAB C15.
- Fumbiza ifumbire ikorwa n'iminyorogoto Litiro 1y'ifumbire muri L10-15 z'amazi. Iyi fumbire yitere kubiti 30-40 bya kawa, mugitondo kare cyangwa nimugoroba. Yitere ukoresheje impompo isohora umuti neza. Irinde kuyitera mugihe ibiti byahungabanyijwe n'amapfa. Igihe umugeze ukabije, wayitera buri byumweru bibiri

## B. Gukoresha imiti

Mbere yo gutera umuti uwo ari wose, umuhinzi asabwa kubanza kugisha inama ababishinze (Agronomes cyangwa abafashamyumvire) kuko imiti irwanya umugese igenda isimburana (ihindagurika) ndetse buri miti yose ntikoreshwa mu buryo bumwe. 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.

**\*Icyitonderwa:** Ni ngombwa gutera umuti ku ruhande rwo hasi rw'ikibabi cy'ikawa

## 2) Akaribata

Akaribata ni indwara ifata ibitumbwe bya kawa, ikaba iterwa n’uduhumyo twitwa “*Colletotrichum kahawae*)”

Iyi ndwara igira ubukana bwinsi ahantu hafite ubutumburuke buri hejuru ya metero 1600. Ibihe by’imvura n’ubukonje bituma iyi ndwara yiyongera cyane kandi n’uduhumyo tuyitera tukihuta mu gufata ibitumbwe byinshi. Iyo uku gukwirakwira kw’uduhumyo bibaye mu gihe cyo gusarura, iyi ndwara yangiza ibitumbwe kurushaho kuko ituma bihunguka ku giti



Ifoto yerekana indwara y’akaribata

### Ibimenyetso by’indwara y’Akaribata

- Iyi ndwara ituma igitumbwe kiba umukara nk’icyamenetseho amazi ashyushye
- Aho yafashe ibitumbwe bigaragara ibidomo by’ikijuju kandi bigahombana, bikagera n’ubwo bibora cyangwa bigahinduka umukara.
- Ibi bimenyetso bigaragara ku bitumbwe, ku giti no ku mabababi.
- Ifata kandi amababi n’udushami bikiri bito
- 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 birenga 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
- Mbere yo gutera umuti uwo ari wose, umuhinzi asabwa kubanza kugisha inama ababishinzwe (Agronomes cyangwa abafashamyumvire) kuko imiti irwanya akaribata igenda isimburana (ihindagurika) ndetse buri miti yose ntikoreshwa mu buryo bumwe.
- Imiti iterwa mbere yo gusarura kugira ngo hirindwe ko ubukana bw'imiti bujyana n'ibitumbwe mu gihe cy'isarura.

### **3) Indwara ya Gikongoro (Dieback)**

Ni indwara bita « Die-back "iterwa n'umukeno. Ikinze gufata kawa ziteye ku butaka bubiri, izidakoreye neza ndetse na kawa zeze cyane ariko ntizibone ifumbire ihagije

#### **Ibimenyetso:**

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



### **Ibimenyetso bya Dieback**

#### **Kwirinda no kurwanya iyo ndwara:**

- Gutera kawa mu butaka bwiza kandi zigasukurwa neza
- Gufumbira bikwiye kandi ku gihe,
- gusasira buri gihe ndetse no kuzikata neza kandi ku gihe/

#### **Inshuti z'abahinzi**

Udusimba tw'inshuti z'abahinzi mu ikawa dufite akamaro kanini kuko dufasha kurwanya udukoko twangiza ikawa mu buryo karemano, bityo bikagabanya gukenera gukoresha imiti myinshi yica udukoko. Utu dusimba, nk'inzuki, utunyugunyugu, n'utundi udusimba turya udukoko twangiza ikawa, tugira uruhare mu kubangurira indabo z'ibimera bitandukanye no kongera umusaruro, tunafasha kubungabunga ibidukikije. Kurinda no kubungabunga utu dusimba bituma ikawa igira ubuzima bwiza, umusaruro ukiyongera, ikiguzi cy'ubuhinzi kikagabanuka, bityo bigatanga inyungu zirambye ku muhinzi

#### **1) Imbogo**



Rurya udusimba twinshi harimo n’udusurira. Ni umwanzi karemano w’udukoko twangiza ikawa. Ibi bifasha kugabanya gukoresha imiti yica udukoko, bigatuma ubuhinzi burushaho kuba karemano kandi burengera ibidukikije.

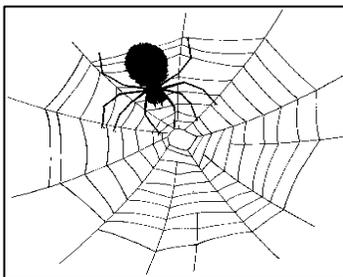
## 2) Nyiramabara



- Tuba twiburungushuye hejuru kandi tugira amabara y’umukara n’umutuku (utari oranje).
- Udukuru n’ibyana byose birya uturyi, akenshi usanga tuba hamwe.
- Ntutwitiranye n’udusurira tubi

Ni umwanzi karemano w’ibyonnyi byangiza ikawa, cyane cyane **uduhunduguru n’utumatorizi (udusimba twonka amazi y’amababi)**, n’utundi dusimba duto twanduza ikawa. Nyiramabara irya ibi byonnyi mu bwinshi bityo ikagabanya umubare wabyo mu murima, bigatuma amababi n’imbuto by’ikawa bidahungabanywa. Ibi bifasha kugabanya gukoresha imiti yica ibyonnyi, bikarengera ibidukikije n’ubuzima bw’umuhinzi, kandi bigateza imbere uburinganire bw’ibinyabuzima n’umusaruro urambye w’ikawa

## 3) Igitagangurirwa



- Kirya udusimba twinshi
- Ibi bituma ikawa igira uburinzi karemano, bigagabanya gukoresha imiti yica ibyonnyi, bikarengera ibidukikije n’ubuzima bw’umuhinzi, kandi bigafasha kubungabunga uburinganire bw’ibinyabuzima no kongera umusaruro w’ikawa mu buryo burambye

## 4) Urutambara



- Rurya udusimba turimo n'udusurira
- Mugikono kimwe havamo udutambara 100
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### 5) Utuvubi duto



- Ni utuvubi duto dutera amagi ku magi y'utundi dukoko. (Ntacyo dutwara abantu).
- Ibyana byatwo birya andi magi bikayica.
- Dukunda kuyatera ku magi

y'udusurira. Amagi y'udusurira yatewe amagi n'utwo tuvubi ahita ahinduka ikigina, bityo akavamo utuvubi mu gihe ayasigaye ari umweru avamo udusurira.

- Utuvubi tuguruka turwanya cyane udusurira tubi cyane cyane udusurira