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LEKWALO LA GRAIN SA LA BALEMIPOTLANA

DIPHALANE 2023



GSA
GRAIN | GRAAN



Setshwantsho: Petra Seymore.

Matshwao a dikhemikale a na le ditlhokego tse dintshwa

BALEMIRUI LE BADIREDI BA MO DIPOLASENG BA TSHWANETSE GO TLHOKOMELA GORE MATSHWAO A DIBOLAYADISENYI TSA GO SIRELE-TSA KUMO MO DIPOLASENG A A FETOGA MME A TLA TSWELELA GO FETOGA KA NAKO E E RILENG. LEBAKA KE GORE GO RULAGANGWA TSAMAI-SANO MO LEFATSHENG KA BOPHARA KA NTLHA YA *GLOBALLY HARMONISED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS* (GHS), E E AMANG BAREKISI BA DIKHEMIKALE BOTLHE MO MADIRELONG.

Bothokwa ba go rulaganya GHS bo tšile ka ntlha ya thekiso ya dikhemikale mo lefatsheng ka bophara, mo gantsi go direga go fetelela melwane a mafatshe go tšena mo dikgaolong tse mo go buiwang dipuo tse di farologanang le kgono ya go buisa le go kwala e e farologanang – mme jalo go tšisa ditlhaselo fa go buisangwa ka tshwanno mme le fa go netefatswa boikarabelo ba tiriso ya ditshupetso tsa tiriso ka tlhokomelo.

Mo Aforikaborwa, GHS e emiswa ke molao go tloga Lwetse 2022 mme e kwadilwe mo *The Regulations for Hazardous Chemical Agents (No. R280 of 29 March 2021)*. Go tloga moo, matshwao le makwalo a tiriso a a sireletsang dijalwa a tshwanetse go tamaelana melawana e e tlhomilweng fa go diriswa dikhemikale tse di ka bolayang. Nagana gore go na le nako ya go feteletsa ya dikhemikale tse di setseng di rometswe teng kgotsa tse di bopilweng pele ga letlha le.

Mo athikeleng e go tlaa lebeletwa dikhemikale tse di diriswang go sireletsa dijalwa. Go bothokwa go balemirui le badiredi ba balemirui go tlhologanya mokgwa o montshwa wa popego, ka gore mathata a a tsamaelanang le tiriso ya khemikale e e rileng, mokgwa wa go dira wa yona le kgono ya go bolaya ya yona di buiwa ka mekgwa e e farologanang, jaaka go kwala, go dirisa dikayakotsi, go dirisa mafoko a a gatelelwang mo matshwaong le mo makwalong a a supang tshireletso ya dijalwa.

DINTLHA TSA KAROLOGANYO TSA BORAI

Go ya le GHS, mokgwa wa diphatso o kgaoganyana ka dintlha tsa

Matshwao a dikhemikale a na...

bodiphatsa, mo go nang dikgaolo tse 29. Bokan abo bo ka nnang 17 ba dikgaolo tse ke diphatsa tse di bolayang ka go bonwa, jaaka diedi tsa go ja tsa asiti, tse di leng lesome di senya boitekanelo, jaaka go ja le go senya letlalo, mme tse pedi di senya llaga ya ouzone. Dikgaolo tse di kgaogangwa ka ditlhophaga kgotsa mefuta, tse di supiwang mo sekayakotsi se se ka diriswang go laola diphatsa tsa mefuta e e farologaneng.

Mo kgaolong e nngwe le e nngwe, bogale ba phatsa e nngwe le e nngwe bo neiwa go tsamaelana le maemo a bogale ba yona ka go dirisa palo – e le sekao, kgaolo ya 1 e tlaa nna bogale go gaisa maemo a mangwe. Dikgaolo tse dingwe tse di kgaogangwa gape mme di kgaolonye tse di supiwa ka go dirisa ditlhaka, ke gore, A, B, C le go tswela.

Ntlha e nngwe e e leng e kgolo ya go fetoga mo matshwaong ke gore ga go sa diriswe mmala go supa bogale ba sebolayadisenyi. Ntlha e e ka nna tlhobaelo go ba bangwe, mme re tshwanetse go nagana gore kgaoganyo ya GHS ya diphatsa tsa dibolayadisenyi e rulagangwa ka go lebelela bogale ba tsona, fa tiriso ya mmala e kgona go supa bogale bo bo bolayang fela – ke go re kgaoganyo e koma.

Ntlha e nngwe e e leng e kgolo ya go fetoga mo matshwaong ke gore ga go sa diriswe mmala go supa bogale ba sebolayadisenyi.

1 Ditlhokego tsa GHS tsa ditshwao.



Product trade name: A-WONDER REMEDY

Note regarding use: BEFORE USING THIS PRODUCT, READ THE LABEL CAREFULLY

Product group: FUNGICIDE

Registration number: Reg. No Lxxxx, Act/Wet No./Nr. 36 of/van 1947

Declaration regarding formulation and use: An emulsifiable concentrate, systemic fungicide for the control of powdery mildew on crops as listed. / 'n Emulgeerbare konsentraat, sistemiese swamdoder vir die beheer van poeieragtige meeldou op gewasse soos aangedui

Resistance group code: 5

Active ingredient and quantity: Spiroxamine (spiroketalamine) 500 g/l Spiroksamien (spiroketalamien)

Hazard statement: Fatal if swallowed

Precautionary statements: Wash hands thoroughly after handling, Do not eat, drink or smoke when using this product, IF SWALLOWED: Get emergency medical help immediately, Specific treatment (refer to safety data sheet), Rinse mouth, Store locked up, Dispose of contents / container in accordance with local regulations

Pictogram: GHS02 (Skull and crossbones)

Signal word: DANGER

Company trademark and name: A-CHEMICALS

GHS gape e dirisa ditshupetso, dikaya-kotsi le mafoko a a supang kotsi go supa bogale ba dikhemikale, mme gape le tse di tshwanetseng go dirwa go itshireletsa. Ditshupetso tsa diphatsa tse di kwalwang di bontsha bogale ba dibolayadisenyi jaaka di kgaogangwa ka dikgaolo tsa maemo a bogale ba tsona. Di simolola ka tlhaka ya 'H', ka go salwa morago ke dipalo tse tharo.

Go diphatsa tsa go bolaya, setshwao sa go kwalwa le tlaa simolola ka H2 (go salwa morago ke dipalo tse pedi), tse di leng kotsi go boitekanelo di simolola ka H3 mme tse di leng kotsi go tikologo di simolola ka H4, e le sekao, H300: *E a bolaya fa e metswa*. Makwalo a a supang diphatsa a mo ditshwaong le mo lekwalong la tshireletso – le gale, khoute (ke gore, Hxxx) e tshwanetse go bonwa fela mo lekwalong la tshireletso e seng gape mo setshwaong.

Boipolelo ba tlhokomelo bo diriswa go tlhalosa jaaka kgaolo e e kotsi ya sebolayadisenyi e tshwarwe fa e diriswa, mme gape le gore go rulagangwe ditlamelo dife go netefatsa gore diphatsa tsa go se tshwara kgotsa go se dirisa di fokotswe. Boipolelo ba tlhokomelo bo simolola ka tlhaka ya 'P' ka go salwa morago ke dipalo tse tharo tse gape di kgaogangwang ka dikgaolo tse di supang mofuta, fela jaaka mo boipolelo ba tlhokomelo.

Ke go re, boipolelo ka sephara bo tlaa simolola ka P1 go latelwa ke ditlhaka tse pedi, boipolelo ba go thibela kotsi ka P3, boipolelo ba go boloka sebolayadisenyi ka P5, sekao, P264: *Tlhapa diatla sentle morago ga go tshwara*.

Makwalo a a boipolelo a fitlhelwa mo ditshwaong tsa sebolayadisenyi le mo makwalong a tshireletso, mme a tsamaelana le boipolelo ba kotsi le sekayakotsi se se rileng. Fela jaaka ka boipolelo ba kotsi, khouto (sekao, Pxxx) bo tlokegwa fela mo lekwalong la tshireletso e seng gape le mo setshwaong. Ka bobedi boipolelo ba kotsi le boipolelo ba tlhokomelo bo

GHS HAZARD GROUPS AND PICTOGRAMS				GHS STATEMENT EXAMPLES	
	Explosive		Chemicals under pressure		Exclamation mark
	Flammable		Corrosive		Health (chronic toxicity)
	Oxidizing		Acute toxicity		Environment

Acute Toxicity Category 1 (oral exposure)
Hazard statement: H300 – fatal if swallowed
Precautionary statements: P264: Wash hands thoroughly after handling, P270: Do not eat, drink or smoke when using this product, P301+P316: IF SWALLOWED: Get emergency medical help immediately, P321: Specific treatment (refer to safety data sheet), P330: Rinse mouth, P405: Store locked up, P501: Dispose of contents / container in accordance with local regulations

Signal words: WARNING | DANGER

Note that the codes (Hxxx/Pxxx) must appear on the safety data sheet, but may be omitted from the label.

The chemical identity of all ingredients contributing to the final GHS classification of the remedy needs to be disclosed on the product label

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tshwanetse go nna le ditlhogo tse di supang gore ke mofuta ofe wa boipolelo bo leng, mme o tshwanetse go beiwa ka fa moja wa sekayakotsi.

Jaaka go supilwe, dikayakotsi di diriswa go supa diphatsa tse di leng robongwe tse di farologaneng tsa dikhemikale, jaaka di tshwanantshwa mo molematlase ga **Lenaneo la 1**.

Lefoko la tshupetso le tshwanetse go bonwa mo setshwaong, mo go na leng a le mabedi fela:

- **Kotsi**, mo go supang phatsa ya kotsi go gaisa, kgotsa
- **Tlhagiso**, mo go supang phokotso ya phatsa ya kotsi.

Lefoko la tshupetso kotsi le le lengwe fela le tshwanetse go bonwa mo setshwaong.

KHUTSWAFATSO

Re supile dintlha tse di seng dintsi tsa GHS, gagolo mabapi le setshwao sa sebolayadisenyi, ka gore bogotlhe ba GHS bo ka se buiwe mo athikele ena, mme go botlhokwa gore balemirui le badiredi ba balemirui ba ithute dintlha tsothle tse.

GHS e batla go supa phatsa ya mateng a khemikale. Ka ntlha ya phatsa e, go na le mathata a go dirisa dibolayadisenyi, mme a a fokotswa fa go lebelelwa setshwao ebile dintlha tse di supiwang di salwe morago ka tlhokomelo. Ka gore sebolayadisenyi se kotsi, ga go re se ka se diriswe.

Koloi, e le sekao, e ka nna kotsi fa o lebelela dikotsi tse dintsi tse di fitlhelwang mo ditseleng mme ga re thibelwe gagotlhe go di dirisa. Bogolo, diphatsa di fokotswa ka go ipofa ka lepanta la tshireletso, go utlwelela molao go se sianisi koloi ka lobelo le le kwa godimo le go utlwelela melao ya tshireletso ya mo ditseleng.

Tlhaloganyo e gape e ka diriswa fa go diriswa dikhemikale tsothle tse di leng kotsi, mo go le botlhokwa gape go tlhaloganyana setshwao sa dikhemikale. Mme gakologelwa, go dirisa sebolayadisenyi se sengwe le se sengwe ka mokgwa o o se supiweng mo setshwaong ke go dira kwa ntle ga molao – jalo dira se se siameng mme netefatsa gore wena, tota le motho mongwe le mongwe yo dirang mmogo le ene, a itse ka go tsenelela go dirisa dibolayadisenyi ka tlhokomelo le boikarabelo. ■

ELRIZA THERON,
MOLAODI WA TSHEGETSO
LE PUISANO, CROPLIFE SA



MAFOKO A GA...

Phumzile Ngcobo



FA BALEMIRUI BA LEBELELA PELA GO SETLHA SA GO JWALA SE SE TLAANG, GA BAKGONE GO ITSHWARA GO SE LEBELELE MORAGO GO DITLHA TSA GO JWALA TSE DI FETILENG MME LE TSE BA DI ITHUTILENG KA NAKO YA GO JWALA.

Se se leng bothokwa ke go bona thobo e e lekaneng. Le gale, go fetola go go dirisa ditiragalo tse di siameng tse di tlhamaletseng tsa balemirui go sala go nna go le ntlha e e bothokwa fa go diriswa balemirui.

Ditso tsa bošeng di supa jaaka bodirelo ba balemirui bo amangwa gagolo ke dintlha tse dingwe gape, jaaka maemo a tlelaemete, kgono ya go nna teng ga ditokelelo le thekiso ya tlhaka e e bonwang. Kgono ya balemirui go ithoma go maemo a tlelaemete go tlhotlheletsa kgono ya go uma ya bona mme le kgono ya go tswelera go dirisa balemirui ka kgono fa ba dirisa lenaneo la go uma le le rileng.

Phethogo ya meamo a dintlha tse di tlhotlheletsang kgono ya balemirui ya go uma tlhaka (tlelaemete, kgono ya go bona ditokelelo tse di tlhokwang le marekisetso) di tlhoka balemirui go ela tlhoko tota mabapi le ditiragalo tsa bona tsa go uma. Fa maikaelelo a go uma a kgotsofatswa, dintlha tsa tikologo le go ipaakanya go kgona go uma gape di tshwanetse go gatelelwa.

Go tsaya diteko tsa mmu ke ntlha e e leng theo ebile e bothokwa gagolo go laola ditiragalo tsa go uma tlhaka – go dumela go dirisa lenaneo le le siameng la go lokela monontsha go bona thobo e e lekaneng. Tlhopho ya peo e e diriswang e tshwanetse go tsamaelana le maemo a tlelaemete mo kgaolong mo go jwalwang.

Jaaka go buiwang, se lokele mae a gago mo serotong se le sengwe! Go refosanya ditiragalo tsa gago tsa balemirui go bothokwa mme go tshetsetsa ebile go tswelletsatsa kgwebo ka go laola ka kgono le go bona poelo e e lekaneng go phedisa balemirui. Go uma tlhaka go tshwanetse, mo go kgonegwanang, go refosangwa mabapi le go rua diruiwa. Ke go rulaganya tsamaesano ya ditiragalo tse pedi tse mme le go tswelletsatsa le go phedisa ditiragalo tsa balemirui.

Bolaodi ba dijwalwa go tswelera ka setlha sa go mela mabapi le go laola mefero, disenyi le malwetse ke ntlha e le nngwe e e leng bothokwa gagolo go bona thobo e e lekaneng.

– *Phumzile Ngcobo ke mothusimolaodi wa kagaolo mo ofising ya kwa Dundee.* ■

Go bona kgatiso ya Seesemane ya Pula ya kgwedi e, dirisa khouto ya QR.



Dikeletso tse mabapi le tlhokomelo ya sediriswa sa go jwala

DITSWAMORAGO TSA TIRO YA SEDIRISWA SA GO JWALA MO BOTENG BA PEO BO BO SA LEKANENG, PEO MO GODIMO GA MMU, DIPHATLHA TSA PEO TSE DI BULEGILENG, MMU O O BATAOLOTSWENG MO GODIMO GA PEO, TSHWAREGO YA PEO LE GO BATAOLOLA GA MATHOKO. MATHATA A MANGWE A KA NNA GO TLOGELATLOGELA, GO LOKELA GABEDI LE GARARO – MME MORAGO GA TSOTLHE TSE, BOKANA BA KUMO BO TLA FOKOTSEGA MME LE POELO E E BONWANG E TLA FOKOTSEGA.

O ka kgona go tswela ka sediriswa sa go jwala se se sa tlhokomelang mo mmung o o lemiwang jaaka go le tlwaelo, mme e seng mo maemong a a thata a go se leme. Didiriswa tsa go dirisiwa go jwala mo mmung wa go se leme le mofuta e mengwe ya go suga mmu e tshwanetse go kgona go jwala mo go leng disalela tse di leng bokete, kgona go tsenelela mo mmung o o leng thata, kgona go bula foro ya popego ya 'V', kgona go baya peo ka go katogana go lekana le ka boteng bo bo tshwanang, kgona go tswalela phatlha ya go baya peo gore peo e kgome mmu ka tshwanno, kgona go se bataole mathoko a foro e e bulwang mme le go kgona go se bataole mmu o o mo godimo ga peo. Dintlha tsotlhe tse di tshwanetse go dirwa fa go tsamaya 6 km/h go 10 km/h, go lokela peo e e ka nnang 20 ka motsotswana mo mmung.

Go thibela mathata a go jwala, pele tlhola sediriswa sa gago gore se dire sentle, mme gape tswela go nna o tlhola gore sediriswa sa gago se dire ka tshwanno mo tshimong ebile nna o se fetola ka nako ya go jwala gore se dire jaaka o tlhoka.

Dintlha tse di latelang tse 14 di tshwanetse go lebelelwa:

1 Dimetara tsa tekanyo

Dimetara tsa tekanyo tse di fosang di baka go tlogela, go lokela gabedi le gararo gangwe, ka tatlhego e e rileng ka nako ya thobo. Go netefatsa kgono e e rileng, tthatlhamola dimetara tsa tekanyo, tosa maswe mme phepafatsa bogodimo ka metsi a a nang sesepa. Refosanya dibipo tse di senyegileng. Refosanya menwana mo metareng e e nang menwana e e selang. Tshwantsha kgatelelo ya menwana mme bofelela ka tshwanno. Tlhola polata ya morago le mafeelonyana a peo mme refosanya fa go tlhokegwa. Gape tlhola lepanta mo dimetareng tse di nang menwana. Le tshwanetse go nna boleta, se nne le mo go phanyegileng mme le tshwanetse go nna phepa. O ka e tshasa ka kerafaete go tsamaisa metara ka tshwanno.

Go utlwega go isa metara e e nang menwana ya gago go morekisi wa yona go e lekalekantsa. Fa o na le metara ya lolea kgotsa ya mowa, tlhola lolea kgotsa kgatelelo ya mowa gore go nne jaaka go tlhokegwa, tlhola gore ga go mo go dulang ebile le gore mafeelonyana a a feteletsang ga a a fela mme baakanya/refosanya jaaka go tlhokegwa.

2 Dikgaolo tsa sediriswa sa go jwala

Go jwala ka boteng bo bo lekaneng go ka senyega fa dikgaolo tsa sediriswa sa go jwala di sa bofiwa ka tshwanno. Ga o a tshwanna go

kgona go kuka kgotsa go isa thoko kgaolo ya sediriswa sa go jwala. Lebelela dikgaolo tsa sediriswa sa go jwala sa gago ka fa thoko. A di lekana ka maemo a bogodimo a tsona? Fa kgaolo e le nngwe e le godimonyana go bapa le tse dingwe, e tlhoka kelotlhoko. Bothata bo bo rileng ke gore diboutu di bofologile kgotsa fa gongwe go tlhokwa koketso ya dibušu. Gape o tlhoka go refosanya dihopore tsa peo fa di phanyegile kgotsa fa di senyegile.

3 Diteseke tsa go bulela peo

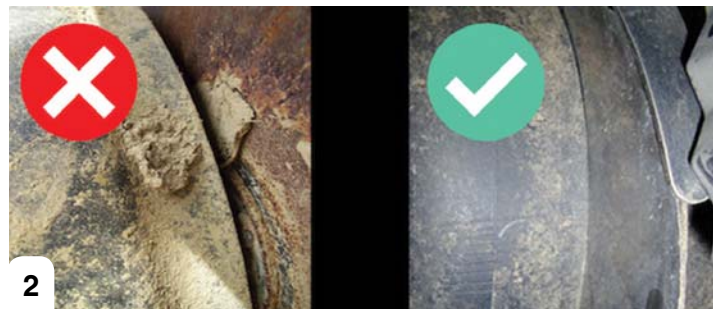
Diteseke tsa go bulela peo di tshwanetse go nna le phatlha e nnye (tlhola bukanatshupetso ya tiriso), ka di ka se lokele peo ka boteng bo bo tshwanetseng. Mo bontsing ba mofuta ya didiriswa tsa go jwala go diriswa diteseke tse pedi tse di kgomanang go bula foronyana mo mmung, mo go beiwang peo. Tsamaelano gare ga diteseke tse pedi tse e botlhokwa gagolo go netefatsa gore go nne foronyana e phepa ya popego ya 'V' mo go ka beiwang peo.

Fa go katogana ga diteseke tsa peo go sa siame mme maswe a kgona go tsena gare ga tsona, go baka mathata jaaka:



Netefatsa gore diteseke tse di bulang ga di a jega go feta.

Motswedi: <https://www.striptillfarmer.com/articles/4186-how-to-check-your-disc-openers>



Phatlha gare ga leotlwana la mmithara ya boteng le tseke ya peo it ka baka mathata.

Motswedi: <https://www.striptillfarmer.com/articles/4186-how-to-check-your-disc-openers>

- Go rulagangwa popego ya 'W' e seng ya 'V', ke go re peo e wela ka bogodimo bo bo sa lekalekaneng mme ka gore ga e nne mo gare ga foronyana e e phepa, go direga gape gore foronyana e se khupetswe sentle ebile go kgomana ga peo le mmu ga go a siama, mo go bakang mathata ka nako ya go tlhoga.
- Go nna le go katogana ga diteseke, o dumela gore maswe a a omileng a wele mo foronyaneng le go kgomana le peo.
- Maswe a, a a tsamayang gare ga diteseke gantsi a ka baka diteseke go robega fa maemo a metsi mo mmung a oketsega.

Lokela dikaratanyana tsa kgwebo tse pedi gare ga diteseke mme di sutetse bogaudfi bo bo kgonegang go tlhola ntlha e (**Setshwantsho sa 1.**) Fa diteseke tsa go bula foronyana di senyegile go feta, o tlaa bona phatlha ya popego ya 'W' e seng e e tlhokekgwang ya popego ya 'V'. Lokela karatanyana e le nngwe mo godimo mo diteseke di kgomana mme e nngwe mo tlase, fela go lekana gore kgona go tshwara dikarata gore di se we. Lekalekantsha bokana ba go katogana gare ga dikaratanaya tse pedi. Go tshwanetse go nna disentimetara tse di ka nnang 6 go kgomana gare ga dikaratanyana. Fa go se kgomane gare ga dikarata go le nnye go feta, tlosa dišhimi. Fa go le kgolo go feta, oketsa palo ya dišhimi go bona go kgomana go le disentimetara tse di ka nnang 6.

4 Dithupu tsa peo

Dintlhana tsa dithupu tsa peo di ka fela go fitlhelela di konegele teng, mme di kapa peo. Gantsi di na le kobe magareng mo di ka robegang. Ditshireletso tsa dithupu tsa peo di tshwanetse go nna bophara bo bo rileng ebile di tshwanetse go bofelelwa ka tshwanno, ka gore tshenyego ya ditšhupu tsa peo e ka nna teng. Phepafatsa ditemogi fa sediriswa sa go jwala sa gago se na le tsona.

5 Dikgateledi tsa peo

Tsena di gatelela peo tlase mo foronyaneng e go beiwang peo, mo go netefatsang gore peo e beiwe ka boteng bo bo rileng. Bokana ba kgatelelo bo ka fetolwa ka go dirisa boutu. Fa dikgatelelo tsa peo di senyega ka go lootsega go feta, di tshwanetse go fetolwa.

6 Maotwana a boteng

Ntlha ya maotwana a boteng ke ntlha e gantsi e buisabuisa batho gore ke afe a a siameng go gaisa a mangwe – gaufi le teseke ya peo kgotsa go katoga ga teseke ya peo. Fa go na le phatlha gare ga maotwana a a lekalekantshang, go letla maswe a a omileng go tsena gare ga diteseke le leotwana le le lekalekantshang, mme go bonega tshwantsho ya 'mogatla wa mokoko' ya maswe a a omileng mo remeng kgotsa lepeng ya maotwana a a lekalekantshang. Maswe a a kolopelwa godimo ke maotwana a a lekalekantshang mme a wela fatshe go kopana le peo, mo go tlisetsang mathata a go simolola go tlhoga ga peo. Bona **Setshwantsho sa 2.**

Jaaka sediriswa sa go jwala sa gago se ntse se senyega, kgotsa tota le mo se se leng ntshwa, go katogana gare ga maotwana a a lekalekantshang le diteseke tsa peo go ka fetoga.

- Mo sediriswa sa go jwala sa sentshwa, letsogo la leotwana la go lekalekantsha le ka sala le sa setwa ka tshwanno.
- Dithaere di ka nna di fedile.
- Matsagao a maotwana a a lekalekantshang a ka nna a konegile.
- Dibering/diase di ka nna di senyegile.

Go netefatsa gore bokana ba go katogana ba maotwana a go lekalekantsha bo siame, tlhola gore matsogo ga a a konega, dithaere ga di a fela go feta ditshupetso tse di rielng mme le gore dibering di ntse di siame. Kuka sediriswa sa go jwala, baya ditsholetso ka fa tlase ga maotwana a go lekalekantsha mme sakisa sediriswa sa go jwala go nna mo ditsholetsong tsa maotwana a go lekalekantsha. Jaanong dirisa mekgwa e e farologaneng ya mefuta e e farologaneng ya didiriswa tsa go jwala go š maemo a maotwana a go lekalekantsha mo a

kgomang teseke ya go jwala bothofo mo maemong a go kopana le mmu mme a sa kgona go dikologa.

7 Dikoltara

Tlhola molagare wa dikoltara mme di refose fa go tlhokekgwa. O tshwanetse go fetlola thaiso ya boteng ya dikoltara tse di fedileng mme di sa ka diriswa.

8 Diphepafatsi tsa mela

Tlhola gore di sa siame. Fetola go tsamaelana le go fela ga tsona kgotsa refosanya fa di fedile go feta.

9 Maotwana a go khuphetsa

Maotwana a go khupetsa a tshwanetse go nna le separeng mme di tshwanetse go tlholwa go bona gore di sa siame. Dibering ga di a tshwanna go tshikinyega kgotsa go nna bothofo go feta. Matlase a rabore kgotsa a tshipi a maotwana a a khupetsang a tlhokwa go katogana mo go ka nnang 37 mm go 50 mm. Letsogo la leotwana le le khupetsang ga le kgonne go nna le go tshikinyega go feta. Fa go le jalo, go ka tlhokekgwa go refosanya dibušhing kgotsa letsogo ka bogotle.

10 Tlhomamiso ya dikoltara, diteseke tse di bulang le maotwana a khupetsang

Tsaya mogala mme o goga ka go tlhamalala go tloga mo koltara ya kwa pele go maotwana a go khupetsa. Maotwana a go gatelela, tsa go bulela peo le dikoltara di tshwanetse go nna di tlhamalane. Maotwana a go khupetsa ga a a tshwanna go tsamaya mo godimo ga foro ya peo.

11 Mabokoso a sebolayaditsenekegi

Mabokoso a sebolayaditsenekegi ga a tshwanna go nna le diphatlha kgotsa go phanyega. Dithupu di tshwanetse go phepafatswa ka go dirisa mowa mme gape le seloto ka mo matlaseng a metara.

12 Kgaolo ya go lokela monontsha

Diteseke tsa go bulela monontsha di tshwanetse go nna di bulegile ka bonnye bo bo kgonegang (tlhola lokwalo la tshupetso). Di bering di tshwanetse go se tshikinyege kgotsa go bofiwa go feta. Anega kgamelo ka fa tlase ga thupu ya kgaolo mme tsaya teko ya go leka. Tshwantsha boima ba monontsha bo bo tlhokekgwang mme seta gape sediriswa sa go jwala go netefatsa gape go netefatsa gore bokana ba monontsha bo bo tlhokegang bo a lokelwa.

13 Diketane le disprokete

Tlhola diketane le disprokete tsothle. Fa di senyegile kgotsa dikopantsho tsa diketane di gagametse, di tlhoka go refosangwa. Diketane di tshwanetse go gagamala ka go lekana mme di tshwanetse go tshaswa ka kerisi go lekana.

14 Kgatelelo ya mowa mo dithaereng

Pompa dithaere go lekalekantsha kgatelelo ya mowa mo go tsona – gakologelwa gore maotwana a sediriswa sa go jwala a tsamaisa mo go ka nnang tsothle mo go sona.

Go bona kitso gape, ikopantshe le morekisi wa didiriswa tsa go jwala go go thusa go seta le go tlhokomela sediriswa sa go jwala sa gago. ■



PIETMAN BOTHA,
MOITSEANAPE WA BOLE-
MIRUI KA BOENE

BOLAADI BA NAETEROJENE MO DINAWA

TSA DISOYA BO BOTLHOKWA

MO AFORIKABORWA BOKANA BA KGAOLO YA NAGA A A DIRISWANG GO UMA DISOYA E OKETSEGILE GAGOLO, KA TIRISO YA DI-KGAOLO TSE DINTSHWA TSE DI DIRISWANG GO DI JWALA. MAEMO A GO DI MEDISA GA A TSHWANE GO TLOGA MO BOTLHABA GO YA BO-PHIRIMA BA AFORIKABORWA. BALEMIRUI BA TSHWANE-TSE GO ELA TLHOKO MAEMO A A TLHOTLHELETSANG GO MEDISA DISOYA A MO KGAOLONG E NNGWE LE E NNGWE MABAPI LE GO PHEDISA DIBAKETERIA TSE DI TLHOTLHELETSANG PAAKANYO YA NAETEROJENE.

Molemirui mongwe le mongwe o tshwanetse go swetsa gore o tlaa dirisa sediriswa sefe mo disoya tsa gagwe le jaaka a laola tiriso sa sona. Mo athikeleng e ditshupetso tsa theo tsa go supa gore go dirwe jang go tlhophla le go dirisa sediriswa se go a tlhaloswa.

PAAKANYO YA NAETEROJENE KA MOKGWA WA BAEOLOJI

Tsa go baakanya maemo a naeterojene di wela tlase ga dibolayadisenyi tse di kwaletsweng mo Lefapeng la Bolemirui la Aforikaborwa mme tsotlhe di tshwanetse go kwadiswa pele go laolwa ka molao pele di ka rekiswa.

Mefuta yotlhe ya disoya e tshetsegwa ke *Bradyrhizobium japonicum* go baakanya maemo a naeterojene ka mokgwa wa baeoloji. Letlole la Dipatlisiso la Bolemirui (ARC) le tlhomile *B. japonicum* WB74 kgale, mme go na le mefuta e e farologaneng ya disoya e e kgonang go baakanya ka bontsi maemo a naeterojene. Mefuta yotlhe e e kwaletsweng mo Aforikaborwa e dira sentle, mme e diriswa ka go farologana go kgona. Buisana le moemedi wa dikhemikale wa gago go bona tsela ya tiriso e e go tshwanetseng.

Mefuta e e diriswang mo mefuta e e farologaneng ya disoya e utlwega sentle, ka gore o ka bona sediriswa sa baeoloji se se nang tirego e e ka nnang gabedi kgotsa gararo, mme mo didiriswa tsa baeoloji kgaolotiriso e tseneletse thata mo go ka nna diaphatsa go dimela. Fa go na le seeledi se se kgorileng, o tlhoka go fokotsa palo ya mofuta wa *B. japonicum* go lokela mofuta o mongwe wa sediriswa sa baeoloji.

Jaanong go na le mefuta e mebedi ya *B. japonicum* mo sediriswa sa baeoloji, mo se senngwe se fenyang go dira tiro – mo ntlheng e, go baakanya maemo a naeterojene mo diosya. Jalo, ka nnete jaanong go na le phokotso ya mofuta wa sediriswa, se se fenyang go dira tiro.

Maemo a sediriswa sa baeoloji ke ntlha e e botlhokwa ya *B. japonicum* mme a tlaa tlhotlheletsa kgono ya sona go dira ka tshwanno mo masimong. Ka ntlha ya go se gole ka bonako ya tshedinye tse, sediriswa sa baeoloji kwa mafelelong se tshwanetse go se nne la disenyi mme se tshwanetse go nna le ditshedinye tse dintsi.

Ka go boela morago, dingwaga tse di leng lesome bontsi ba didiriswa tsa baeoloji tse di neng di rekiswa di ne di rulagantswe go nna le kgono ya go dira mo go ka nnang kgwedi go dikgedi tse thataro, ka diawara tse di leng 24 go se tlhabela le go se lokela mo mmung. Le gale, ka dithekenoloji tse dintshwa, sediriswa sa baeoloji se ka

diriswa go fithelela dikgwedi tse 18 ka matsatsi a a ka nnang 60 gare go tlhabelela le go lokela mo mmung. Ntlha e e supa gore didiriswa tsa baeoloji jaanong di na le thokgamo le kgono e e rileng, ka thekenoloji e e okeditsweng go sireletsa dibaketeria mo peong.

GO RULAGANYA DITHUMPUNYANA

Go rulagangwa ga dithumpunyana gape go botlhokwa, ka bokana ba naeterojene ya dimela e e ka bopiwang e ka nna galesemo go feta mo medikgolo go gaisa e e leng mo popegong ya meditlaleletso.

Tlhokomela go se lebelele palo ya dithumpunyana fela, mme bogolo jaaka di rulagantswe mo kgaolong ya medi. Go botlhokwa gagolo, ka gore bokana ba naeterojene bo bo lekanang bo ka beiwa mo thumpunaya e le nngwe e e lekaneng ka boima ba go oma go bapiswa le dithumpunyana tse di leng mo meditlaleletso tse di leng lesome.

MAEMO A FA GO JWALWA

Maemo a fa go jwalwa a botlhokwa gagolo, ka dibaketeria le peo di tlhoka metsi go tlhoga le go mela. Go bua go botlhofo mo go dira ka ntlha ya setlha sa go mela mo Aforikaborwa. Bolemirui ba ntse ba gatelela go jwala kgotsa nnyaa ka ntlha ya mmu o o omileng le bollo ba mmugodimo wa 5 cm ka maemo a thempereitsha a a ka nnang 40°C go 50°C. Fa disoya di jwalwa, maemo a a siameng a botlhokwa go bona dithumpunyana tse di siameng le go simolola go tlhoga ga dimela.

Fa o tlhabele didiriswa tsa baeoloji mo peo ya disoya ya gago ka go dirisa mokgwa wa go lokela wa mo-forong, o tlhoka go ela tlhoko maemo a thempereitsha le bogale ba marang a letsatsi. Boloka *B. japonicum* ka maemo a thempereitsha a a ka nnang 25°C kwa ntle ga marang a letsatsi mo meriting.

Tiragalo e e tshwanetse go laolwa ka go gagamatsa dikgole. E le sekao, fa o tlhabela peo, tsaya fela peo e o tlaa e dirisang ka kgaolo ya go dira ya pele ga motshegare. Go eletsega go tsaya peo e e tlhabetsweng sešwa gape le gape mo o e bolokang, mo e tshwanetse go bolokwa ka tlhokmelo le boikarabelo. Bolaodi ba tiragalo ya go tlhabela le peo e e tlhabetsweng mo polaseng bo botlhokwa gagolo go kgona go bona ditswamorago tse di siameng.

Tlhabelo ya peo ka go dira e botlhokwa gagolo go simolala ka tshwanno. Netefatsa gore peo e tlhabelwe ka bogotlhe ka go lekana ka *B. japonicum*. Motšhene wa go tlhabela o tshwanetse go nna phepa tota ka go se nne le dikhemikale tse di ka fetolang kgono ya go dira ya sediriswa sa baeoloji.

Go setwa ga motšhene wa go tlhabela go tshwanetse go dirwa ka letsatsi le letsatsi mme go bothokwa gagolo, tota fa go fetolwa mofuta wa disoya tse di jwalwang ka go se lekane ga peo e e diriswang. Fa tiro e e sa dirwe, o ka bona ditswamorago tse di farologanang mo maemong a dinawa tsa disoya ka nako ya thobo. Netefatsa gore o dirisa melao ya go tlhabela ka mokgwa wa go tlhabela o o dirisang.

MOLYBDENUM LE KOBALT

Tiro ya molybdenum (Mo) le kobalt (Co) e botlhokwa gagolo go

kgono ya go dira ya ensaeme ya naeterogenase, e e dirang e le setsweleletso go kopantsho ya naeterojene mo disoya le dimela tsa mefuta ya dierekisi. Fa Mo le Co di se teng, kgono ya go kopantsha naeterojene e a fokotsega.

Balemirui ba ba kwaletsweng go uma peo ya disoya ba ka lokela Mo gararo go gane ka nako ya go medisa disoya tsa bona go oketsa maemo a bokana ba molybdenum mo peong. Molybdenum le Kobalt di ka diriswa go tlhabela peo kgotsa di ka lokelwa mo forong ya go jwala ka nako ya go medisa disoya, ka di ka thusa go dira ga naeterogenase.

Ka gore bokana ba naeterojene bo bo lekanang bo ka beiwa mo thumpunaya e le nngwe e e lekaneng ka boima ba go oma go bapiswa le dithumpunyana tse di leng mo meditlaleletso tse di leng lesome.

Go na le dithlagiso, ka gore ka bodedi Mo le Co di le mefuta ya leswai mme di ka omisa dibaketeria mo peong fa di diriswa mmogo le rhizobium. Mme jalo netefatsa gore fa o dirisa Mo le Co mo peong, go jwalwa ga yona go direge gare ga diawara tse di ka nnang nne go tse thataro moprago ga go di dirisa. Netefatsa gore o na le maemo a tlhabela ya rhizobium a a kwa godimo ka thekenoloji ya tshireletso ya osmo go oketsa kgono ya go phela ya dibaketeria, ka go ka nna bothlokwa go go bopiwa ga dithumpunyana.

MENONTSHA

Menontsha e bothlokwa mo masimong a disoya, mme bolaodi ba mefuta le mogwa wa go lokela bo bothlokwa gagolo.

- Naeterojene e ntsi go feta ke bothata, ka bokana bo bo ka nnang 10 kg/ha bo lekane go jwala disoya. Bokana bo bo fetang bokana bo bo tlaa thibela go bopiwa ga dithumpunyana mme go tlaa ganela tiragalo ya go uma disoya.
- La bobedi monontsha o tshwanetse go lokelwa mo go ka nnang 50 mm tlase le 50 mm mo mathokong ka bobedi a peo go netefatsa gore metsi le letswai le se e fise.

Dirisa fosoforo (P), potasio (K), sebafole (S), kalsiamo (Ca), magenesiamo (Mg) le dintlhanye go oketsa bokana ba thobo ya disoya. Le gale, di tshwanetse go rulagangwa go dimela tsa disoya tsa gago.

GO BOPIWA GA DITHUMPUNYANA

Ka re le bamedisi ba disoya le ditswerere tsa tirisommu mo masimong, kgato ya R1 e tlaa nna kgato e o tshwanetseng go e lokolola, e le tiragalo ya go bopiwa ya dithumpunyana, mme gape le go e athola fa o batla gore e direge ka tshanno. Fa go sa diregwe, o tshwanetse go dira ka bonako mme wa lokela monontsha wa naeterojene ka maemo a a ka nnang 100 kg go 200 kg. Buisana le setswerere sa tirisommu sa gago go go tlhalosetsa mogwa wa go lokela monontsha o montsi jalo.

A MOKGWA WA GO KGONA KE WA GO LOKELA MO FORONG KGOTSA WA GO TLHABELA PEO?

Ka go lokolola diteko tse dintsi tse di tshwantshitsweng, mekgwa ka bobedi ya go dirisa rhizobium e a kgona mme gantsi kgono e tshetswa ke bolaodi ba ditiragalo tsa mo polaseng ba mojawadi.

Fa o ikutlwa o siame ka mekgwa ka bobedi, tlhopha o o tshwanetseng wena. Mogwa wa go lokela mo forong o ka supa ditswamora go tsa gore go bonalwa palo e e kwa godimo ganye ya go bopiwa



Naeterojene ka go feta e tlaa kgoreletsa go medisa ga dithumpunyana.

ga dithumpunyana mme jalo e bonega fa gongwe e na le kgono ya go gaisa ya go tlhabela peo. Mme fa go rojwa, gantsi ga go bonwe pharologano e kgolo ka dintlha tsa go lokelwa ka go bopiwa ga dithumpunyana mo meding ya tlaletso. Balemirui ba bantsi ba tlhabela peo mme gape ba lokela sediriswa sa baeoloji mo forong go itshegetsatsa le go se fose, mme gape go netefatsa ditswamora go tse di siameng.

Jaaka go jwala ga disoya mo mebung ya motlhaba mo dikgolong tsa bophirima go oketsega, dintlha tsa kgatelelo ya nematode le bolaodi di nna bothlokwa go uma disoya ka kgono. Go tlhotlheletsa popego ya rhizobium ya dithumpunyana, kopantsho ya naeterojene le kgono ya go nna le mo dithumpunyana di ka bopiwang mo meding. Tsweetswee, ikopantshe le morekisi wa gago wa didiriswa tsa baeoloji tse di kwaletsweng fa di le teng.

Didiriswa tsa baeoloji tsa go tlhabela peo ya disoya di bothlokwa gagolo mo ditiragalong tsa gago tsa mo polaseng, go naya bokana bo bo kwa godimo ba naeterojene go dimela tsa disoya tsa gago. Go ka oketsa bokana ba thobo e o ka e bonang ka mo go ka nnang 200 kg go 1500 kg ka heketara. Go tsamaelana la mofuta wa mmu, kgaolo e o leng mo go yona le bokana ba thobo e o e bonang, go ka nna bokana bo bo leng 40% ba bogotlhe ba thobo ya gago. Mme jalo go bothlokwa go dirisa tlhabela ka tshanno ka go dirisa tlhabela ya peo le go lokela mo forong. ■

JONATHAN ETHERINGTON, MOLAODI WA MBFI (PTY) LTD

Laola mefero go oketsa bokana **BA THOBO YA DISONOBOLOMO**

BOLAODI BA MEFERO MO MASIMONG A DISONOBOLOMO BO TSHWANETSE GO DIRWA KA KGOLO LE KA NAKO E E RILENG KA GORE DISONOBOLOMO TSE DINTSHWA GA DI KGOLO GO GAISANA LE MEFERO. GO PHEPHAFATSA MASIMO A DISONOBOLOMO, LENANEO LA GO LAOLA MEFERO LE TSHWANETSE GO DIRISWA. KE GO RE KE LENANEO LE LE DIRISWANG GO LAOLA DINTLHA TSOTLHE TSA GO LAOLA MEFERO, MO TIRISO YA DITIRAGALO TSOTLHE JAAKA DITSWAMORAGO TSA TIRISO, TIRISO YA MEGOMA LE TIRISO YA DIKHEMIKALE DI SUPIWA MO LENANEO LA BOLAODI.

Balemirui ba tshwanetse go ela tlhoko bolaodi ba mefero, tota go tloga fa dimela di simolola go tlhoga go fitlhelela kgato ya go mela ya V8 (mo go ka nnang dibeke tse thataro morago ga go jwalwa). Mo dikgatong tsa go mela tse di latelang tsa semela, kgatelelo ya mefero ga e nne bothata ka gore matlhare le moriti wa ona go tshwanetse go lekana go thibela go mela ga mefero.

Le gale, kwa ntle ga dimela tsa mefuta e mengwe jaaka tsa mmi-di le disoya, mefuta ya dibolayamefero tse di ka diriswang go laola mefero ya pele ga go simolola go mela mo dimeleng tsa matlharebophara jaaka disonobolomo ga e ntsi. Bolaodi ba mefero ya matlharebophara, tota mo disonobolomo tsa masimo a non-Clearfield, bo nna bothata mme bo tlhoka togomaano e e siameng pele peo e loke-lwa mo mmung.

Ka bolaodi ba mefero fa go jwalwa disonobolomo, balemirui ba tshwanetse go simolola ka tlhopho ya masimo mo disonobolomo di ka jwalwang. Simolola ka tiriso ya lenaneo la thefosano ya dijwalwa, mo mmi-di o jwalwa ngwaga pele ga go jwala disonobolomo.

Netefatsa gore mmidi o o laolwe ka mokgwa o mefero ya matlharebophara e loalwe ka kgono mme le gore thefosano ka disonobolomo e ntse e nagangwa fa go tlhophiwa dibolayamefero. Fa go diriswa thefosano ya dijwalwa, la ntlha tlhopho masimo mo mefero ya matlharebophara e se bothata mme jwala disonobolomo mo go ona.

BOLAODI BA MATLHAREBOPHARA LE MAJWANG

Pele ga go jwala, ithlophole lenaneo le le siameng la go laola mefero ya matlharebophara le majwang mo dibolayamefero tsa pele le morago ga go tlhoga ga dijwalwa di diriswa go laola mefero. Mo kgatelelo ya mefero e le kwa godimo, tiriso ya didiriswa tsa go tthagola e bothokwa. Go dirisa sediriswa sa go retolola godimo ga mmu fa go jwalwa disonobolomo pele di simolola go mela go thusa go laola mefero e e tlhogang mo meleng ya dijwalwa.

Fa go jwalwa disonobolomo tsa non-Clearfield kgotsa tsa Clearfield, sediriswa se se dirang mo godimo ga mmu ka go se tsenelele

boteng se ka diriswa gare ga mela go laola mefero pele ga go gasetsa sebolayamefero sa Clearfield.

Bolaodi ba majwang mo masimong a disonobolomo bogolo bo dirwe pele di simolola go tlhoga. Tiro e e ka dirwa pele ga go jwala kgotsa ka go gasetsa disonobolomo pele di simolola go mela. Buisa ditshupetso tsa tiriso go bona gore dibolayamefero di diriswa jang mme balabala go bona gore bokana bo bo farologanang ba diriswa jang.

Mefuta ya Clearfield® le Clearfield® Plus di naya molemirui kgono ya go laola mefero ya matlharebophara morago ga go simolola go mela mo disonobolomo. Ditshupetso di tshwanetse go buiswa sentle go tlhologanya gore dibolayamefero tse di diriswe leng le jang go laola mefero. Netefatsa gore nako e e lekaneng e nne teng pele go jwalwa dijwalwa tse di jwalwang morago ga disonobolomo.

Dibolayamefero tse dingwe tsa pele ga go simolola go mela le tsa morago ga go simolola go mela di ka laola majwang, mme dibolayamefero tse dingwe di ka laola gape mefero ya matlharebophara – le





1 *Dibolayamefero tse di kwaletsweng go diriswa mo disonobolomo le nako ya tiriso e e tshwanetseng.*

Kgaolo e e dirang	Setlhopha sa HRAC	Tiriso pele kgotsa morago ga go tlhoga ga mefero	Nako ya go leta (ikaega ka dijwalwa)	Mefero e sebolayamefero se kwaletswa ¹		
				Majwang	Matlharebophara	Menyakaladi
Clethodim	A/1	Morago ga tlhogo	7 - 30 matsatsi	X	-	-
Cycloxydim	A/1	Morago ga tlhogo	3 dikgwedi	X	-	-
Haloxypop-R-methyl ester	A/1	Morago ga tlhogo	3 dikgwedi	X	-	-
Propaquizafop	A/1	Morago ga tlhogo	10 - 40 matsatsi	X	-	-
Quizalofop-P-tefury	A/1	Morago ga tlhogo	1 - 6 dibeke	X	-	-
Imazamox/imazapyr ²	B/2	Morago ga tlhogo	4 - 20 dikgwedi	X	X	-
Flurochloridone	F1/12	Pele ga tlhogo	6 - 18 dikgwedi	X	X	-
Pendimethalin	K1/3	Pele ga tlhogo	12 dikgwedi	X	X	-
Triflularin	K1/3	Pele ga jwalo	12 - 18 dikgwedi	X	X	-
Alachlor	K3/15	Pele ga tlhogo	None	X	X	X
Metolachlor + Benoxacor (safener)		Pele ga tlhogo				
S-Metolachlor + Benoxacor (safener)	K3/15	Pele ga tlhogo	None	X	X	X
EPTC + Dichlormid (safener)	K3/15	Pele ga tlhogo	None	X	X	-
Metolachlor + Dichlormid (safener)	K3/15	Pele ga tlhogo	None	X	X	-
Metolachlor	K3/15	Pele ga tlhogo	None	X	X	X
Metolachlor + (safener)	K3/15	Pele ga tlhogo	None	X	X	X
Flufenacet	K3/15	Pele ga jwalo	4 - 6 dikgwedi	X	X	-
dDimethenamid-P	K3/15	Pele ga tlhogo	None	X	X	X
S-Metolachlor	K3/15	Pele ga tlhogo	None	X	X	X
EPTC	K3/15	Pele ga jwalo	None	X	X	X
EPTC + safener	K3/15	Pele ga jwalo	None	X	X	X

¹Mefuta ya mefero e e laolwang ka dibolayamefero e a farologana. Ditshupetso di buiswe ka kelotlhoko.

²Go diriswa fela le disonobolomo tsa Clearfield® kgotsa Clearfield® Plus – buisa tshupetso go nna le kitso ya tiriso.

gale fa gongwe go farologana ka mefuta e mengwe ya mefero. Mefuta e ya dibolayamefero e tlhoka gore e lokelwe mo mmung (jaaka ka tsa pele ga go simolola go mela) kgotsa go ne pula e ka nnang 10 mm go 15 mm gare ga matsatsi a a ka nnang supa ka nako ya go e lokelwa gore sebolayamefero se kgone go tsenelela mo mmung. Gakologelwa go tsentsha dintlha tse di leng botlhokwa tse mo tlhophong ya dibolayamefero.

Ka go farologana, dibolayamefero tsa morago ga go simolola go tlhoga di diriswa morago ga mefero e simolotse go tlhoga. Kgaolo ya tiriso mo sebolayamefero e e kwaletsweng go loala mefero ya matlharebophara ya morago ga go simolola go tlhoga e sala e le Imazamox/Imazapyr fela. Le gale, mefuta e ya dibolayamefero e kgo-na go diriswa fela mo mefuteng ya disonobolomo ya Clearfield® le Clearfield® Plus. Se leke go di dirisa mo mefuteng e mengwe ya disonobolomo ka di ka di bolaya, jaaka balemirui ba bangwe ba setse ba bone.

Go thibela mefuta ya mefero e e kgonang go fenywa dibolayamefero mo polaseng ya gago, dibolayamefero tse di farologanang ka mokgwa

wa go dira (kgotsa ditlhopha tsa HRAC) di tshwanetse go diriswa mo mananeo a go uma. Go dirisa lenaneo la thefosano ya dijwalwa mo disonobolomo di thefosangwa le mmidi, e le sekao, go ka thusa go thibela mefuta ya mefero e e kgonang go fenywa dibolayamefero.

Kgaolo ya tiriso e e kwadisitsweng e le jaanong go laola mefero mo masimong a disonobolomo, mme le mefuta e mengwe ya mefero (ya matlharebophara, majwang le monyakaladi) e supywa mo **Lenaneo la 1**. Le gale, go botlhokwa go lemoga nako ya go emisa tiriso ya mefuta e e farologanang ka gore go ka fetola lenaneo la tiriso ya thefosano ya dijwala. ■



PIETSMAN BOTHA, MOITSENAPE WA BOLEMIRUI KA BOENE LE MARYKE CRAVEN, MMATLISISI WA MOGOLWANA, ARC-SMALL GRAIN

Go reng **MMALATLOTLO** a le bothokwa

GO LAOLA DITIRAGALO TSA POLASE GO KA TSAYA NAKO. GO THAPA MMALATLOTLO GO GO NAYA NAKO YA GO TSAMAISA KGWEBO YA GAGO. FA O SA TLHOKE GO KGATHALA GO RULAGANYA DIBUKA TSA GAGO, O KA DIRISA NAKO LE KGONO YA GAGO GO DIRA DITIRO TSE DI LENG BOTLHOKWA TSA KGWEBO YA GAGO.

Ka o le molemirui, segwaba kgotsa mong wa kgwebonnye, tlhoafalo ya gago ya ntlha fa o tshwanetse go swetsa gore o thape mmalatlotlo e ka nna bokana ba go mo duela. O leka go boloka madi mme o nagana gore o ka se kgone go mo duela. Ipotse: A nka kgone go fosa? Nako ya me e bothokwa bokana kang? A tiriso ya nako ya me e siametse go leka go rarabolola bokana ba lekgetho la VAT le ke tshwanetseng go le duela mme nka itse jang gore ke nnete?

Mosola wa go thapa mmalatlotlo o ka thusa kgwebo ya bolemirui ya gago, ka a na le kitso ya go laola ditiragalo tsa go dirisa madi jaaka go sala morago tiriso ya madi le go kwala tiriso ya teng. Dintlha tse di thibela diphoso tse di ka tlisetsang mathata fa go bolokwa diforomo kwa pele.

Mmalatlotlo a ka go naya tebelelo go tswa kwa ntle ka jaaka o ka laolang kgwebo ya gago mme le jaaka o ka tokafatsa tsamaiso ya kgwebo ya gago. A ka go ruta mekgwa ya go fokotsa ditshenyegelo, go go naya tshaloso ka tiriso ya madi le tse dingwe tse di leng bothokwa.

Dintlha tse di ka lebelelwang fa go tshotshwa mmalatlotlo ke tseo:

- Mmalatlotlo o tshwanetse go nna le kgono ya go go bontsha go sala morago mothala wa kgono, tota mabapi le bareki mo tiko-logong ya ditiragalo tsa bolemirui. Tswelela go botsa dipotso mabapi le ditiro le dikgono tsa mmalatlotlo.
- Mmalatlotlo yo o ka tshepiwang o tshwanetse go nna le lekwalo la tshupetsoi, mme ka molao ga a gatelelwe go nna le lekwalo jaaka e le molao go nna boradipalotlotlo. Kopa mmalatlotlo yo o



batlang go mo dirisa ditshupetso tsa tiro e a e diriletseng batho ba bangwe.

- Go ka thusa go kgona go kopana le mmalatlotlo wa gago, mme jalo o tshwanetse go dirisa yo a leng gaufi le wena.
- Mmotse gore dithulaganyo tsa go duelwa tsa gagwe di ntse jang. O tshwanetse go mo tshalosetsa gore o batla gore a dire ditiro dife ebile jaaka o batla gore a di dire. Tshwantsha tuelo e a e kopang le e e kopiwang ke bommalatlotlo ba bangwe.

Mmalatlotlo yo o go tshwanetseng o tshwanetse go itse tsotlhe mabapi le kgwebo ya gago – jaaka o dira, ba o ba duelang le ditshenyegelo tsa gago tsotlhe. O tshwanetse go dumela go netefatsa gore kgwebo ya gago e tsamaya sentle ka molao mme kitso e e tshwanetse go go fiwa ka bonako gape le gape. Fa mkgwa o wena o rulaganyang dibuka tsa gago mme o diriswa sentle, kgwebo ya gago e tlaa lebege e le e e kgonang tota, mme tiriso ya madi a go duela mmalatlotlo a tlaabo a dirisitse sentle. ■



**JENNY MATHEWS,
MOITSEANAPE WA BOLAODI
LE TLHABOLOLO MME GAPE
LE MORUTADITHUTO**

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Ditiragalo tsa kwa moseja di tlotlhetse tlotlhwana ya tlhaka

KA NGWAGA O MONGWE LE O MONGWE FA LEFATHSDE LA AMERIKA (USA) LE SIMOLOLA SETLHA SE GO JWALA, MAREKISITSO A MO LEFATSHENG KA BOPHARA A FETOLA GO MAEMO A BOSA. KE GO RE TSE DI DIRAGALANG GO DIJWALWA KWA USA DI TLHOTLHELE TSA MAEMO LE PHETHOGO YA MAREKISITSO MO LEFATSHENG LOTLHE.

Mo setlheng se, maemo a disoya a ne a sa siame go tloga tshimologo ya ngwaga mme a ne a sa siame tota gare ga dikgwedi tsa Seetebosigo le Phukwi, fa maemo a ne a le kwa tlase ka 50% a maemo a go siama. Jaaka go ntse maemo a mo go ka nngang 54% a maemo a go siama, go bapiswa le maemo a 59% a maemo a go siama a ngogola. Go tthatlogisitse tlotlhwana mo marekisetso a mo lefatsheng ka bophara.

Tiragalo e e bitswa tswelolelo ya tshaba-tlhaka. Fa maemo a bosa a tokafala, tswelolelo e ya fela mme tlotlhwana ya gatelelwa gape. Ka 30 Seetebosigo, Lefapha la Bolemirui la Amerika (USDA) le begile pego e e supang gore bokana ba naga e e dirisitsweng go jwala disoya e oketsegile ka 5% godimo ga bokana bo bo bonweng pele mme gape le gore bokana ba naga e e dirisitsweng go jwala mmidi e fokotsegile ka 5%. Jalo, tokofalo ya maemo a bosa le koketso ya bokana ba naga e e dirisitsweng di gateletse maemo a mmidi, mme pego e ne e kgona go fokotsa kelelo tlase ya tlotlhwana ya disoya.

Tlotlhwana gape e bone tshegetso morago ga Rašia e rile ka 17 Phukwi gore e ganetsa tumelano ya gore dikepe di ka feta mo Lewatleng le lentsho ya gare ga Rašia le Ukraine.

Tumelano e e ne e supa tumelo ya gore dikepe tse di rwalelang di ka tsamaya jaaka di rata mo Lewatleng le lentsho, kwa ntle ga go tshaba dibetsa tsa ntwana tsa mafatshe a ka bobedi.

Rašia e rile tumelano e ga e tshwanele lefatshela yona mme jalo ga e a tlhopha go e tswelolelwa. Ntliha e e dirile gore tlotlhwana e tshegetsewe, ka marekisetso a ne a sa dumele gore tiragalo e e ka a tswelolelwa jang ebile le gore tlhaka le peo ya mafura e ka sa kgonwa go rekwa.

Mokgwa o wa papadisanyo o bitswa papadisanyo ya maikutlo. Fa o lebelela ditiragalo ka bophara, nnete a bonega e farologana. Ditsholofelo tsa go bona thobo e kgolo ka setlha se di ka tliša koketso ya bokana ba thoto ya go salela ka mafelelo a setlha se se latelang. Jalo, ditsholofelo di supa gore tlotlhwana ya tlhaka e ka gatelelwa tlase ka nakotelele fa dintlha tsotlhe di diriswa go rulaganya maemo a tlotlhwana. ■



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Lenaneo le le fetolang botshelo



Balemirui ba leboga ka go menagana

MOKGWA mongwe wa tiragalo o o siameng tota o o diriswang ke Lenaneo la Tlhabololo ya Balemirui ke go oketsa kitso le kgono. Dithutiso di rula-gantswe ka go ruta kitso le kgono ka go badisa le go dira mme di rutwa ka mokgwa wa puo o batsenadithutiso ba o tihaloganyang.

Ditiragalo tse di fetotse tlhabololo ya balemirui ka dingwaga tse di fetileng jaaka di neng di tswelala gagolo. Go fithelela jaanong ditshupetso di supa gore go tihomilwe dithutiso tse di ka nnang 3000. Balemirui ba ntse ba gatelela go amogela dithutiso gape le gape, mabapi le mabaka a a farologaneng. Grain SA e leboga tirisano mmogo e e kgonisang tsamaiso ya lenaneo la dithutiso ka ngwaga le ngwaga.

Go lebogwa Maize Trust le Oil and Protein Development Trust (OPDT), dithutiso tse di latelang di ne di tihomilwe ka kgwedi ya Seetebosigo:

- Tse pedi tsa 'Introduction to maize production' tse di neng di rutwa balemirui ba kwa Kapabothaba.
- Thutiso ya 'Introduction to soybean production' e ne e rutwa kwa Dundee mo dikgaolong tsa Louwsburg.
- Balemirui ba dikgaolo tsa kwa Louwsburg le Dundee ba tsene thutiso ya 'Introduction to sunflower production'.
- Thutiso ya go oketsa kgono ka go dira ya go seta didiriswa tsa go jwala le go gasetsa e ne e tihomilwe kwa kgaolong ya Dundee.



Fa go rutwa thutiso ya, 'Introduction to sunflower production', morutathutiso Timon Filter o tthaloseditse maloko a Setlhophha sa Dithutiso sa Middelburg jaaka go tsaya diteko tsa mmu. Ba rutilwe gape mabapi le go seta sediriswa sa go jwala.

Balemirui ba LEBOGILE TOTA

BALEMIRUI bangwe ba ba tseneng dithutiso ka kgwedi ya Seetebosigo, ba supilwe tebogo morago ga go tsena dithutiso.

- 'Ke itumetse gore dithutiso di tamaile sentle, mme go ne go le monate go ithuta mmogo le morutathutiso mabapi le ditiragalo tsa balemirui. Ke batla go tla gape go ithuta dilo tse dikgolo. Kgaolo ya tirisano e ne e siame tota, totatota. Tsotlhe di ne di siame.'
– Samuel Ramothibe
- Tiro ya tiori e ne e siame – e ne e tlhamaletse mme re ne re tihaloganya tsotlhe. Re tlisitse mabaka a rona a go tsamaisa le go tihologanya balemirui. Re ithutile gape ka go botsa balemirui ba ba setseng ba kgonne. Re ithutile jaaka go jwala, go jwala leng le go roba leng disonobolomo. Re rutilwe jaaka go suga mmu le didiriswa tse di farologaneng. Re rutilwe jaaka go laola mefero le disenyi mme le go seta didiriswa tsa go gasetsa tsa rona jang. Ke itse jaanong jaaka go lokela monontsha mo masimong a me. Re rutilwe gape mabapi le diterekere.'
– Doctor Tshoba
- 'Go oketsa kitso le go tshegetsa gagolo. Go rutilwe sentle ke morutathutiso, yo a neng a tthalosa ka go tthamalala. O bonega a na le kitso e e tseneletseng. Go neilwe dikao go re thusa go tthaoganya sentle. Re a leboga! Maitemogelo a a tseneletseng a morutathutiso a ne a tshegetse setlhophha gagolo. Ditshupetso di ne di tihalogangwa. Maphelo a rona a tokafaditswe gagolo tota!'
– Petrus Mtsweni



Timon gape o netefaditse gore balemirui ba Setlhophha sa Dithutiso sa Pixley, se se neng se tsene thutiso ya 'Introduction to soybean production', se ithute gape mabapi le semela sa disoya le go seta sediriswa sa go gasetsa se se rwalwang. Kgaolo ya thutiso ya tiori gape e neile kitso e e leng bothokwa – fela ka tshegetso ya OPDT. ■