# Welcome!

This information booklet has been prepared for extension officers, and/or field workers who work with NGOs, CBOs, research institutions or national extension departments, and who are partners participating in the *Rocks for Crops Project* funded by the Commonwealth of Learning. Of course, we hope this information will also be useful for others working with farmers' groups and we encourage the sharing and distribution of this resource.

This is a follow-up to the first booklet about the importance of phosphorus for agriculture. In this second booklet, we will discuss an alternative phosphate fertilizer - phosphate rock - and its potential for improving soil fertility on smallholder farms. We will look at the factors that influence the performance of phosphate rock and talk about the advantages and limitations of using it. This resource will provide extension officers with information about the range of phosphate rock products that may be available and recommendations for application procedures.

The goal is to provide you with clear information that can be used in your work to share information with farmers. Many technical papers have been published on the topic and therefore, an effort has been made to include some of the important works in the list of references for those who wish to seek out additional information. Also, please feel free to contact the authors should you have any questions.

We hope that this information package is a useful tool!

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# Acknowledgements

Thank you very much to all those who contributed to the preparation of this information booklet. Photographs were most appreciated and have greatly enhanced the value of this resource. The input from our partners will hopefully ensure that the resource is relevant and useful for those working with courage and dedication to increase the well-being of smallholder farmers in their respective countries.

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# EKIGIMUSA KYA FOSIFETI

## Ng'enkola endala eyokuliikiriza ebimera

## Okwanjula

Omunwe gwa kasooli omutono n'okwengerera kw'amakoola kulaga nti kasooli talina fosiferasi.

Nga bwetulabye, ettaka lingi nyo mu Africa eritalina kigimusa kya fosifeti olwokuba ettaka bbi oba olw'okweyongera kw'obulimi. Wadde nga ebiriisa ebiva mubintu ebivunze bisobola okwongera ku ttaka nerifuna obugimu, ekyo tekimala kuwa ttaka obugimu obwa fosifeti bweriba lyetaga.

N'olwekyo obugimu obuva mubintu ebivunze busaana okw'ongerwako obugimu buno obwa fosifeti mu bitundu gyekitali. Abalimi basobola okwongera kubugimu oba okuliikiriza ettaka nga bakozesa ekiriisa nga: MAP, DAP, TSP nebirala oba okukozesa ekigimusa ekya fosifeti (phosphate rock fertilizer).

Ekigimusa kino ekya fosifeti rock or PR oba nga bwetugenda okuba nga tukiyita, kinyonyolwa mungeri eno:
Obugimu obuleetebwa obutonde nga bulimu ebintu nga fosifeti ebibifuula ebirungi oba ebikirizibwa ng'ebigimusa. Jjukira nti oluusi ekiriisa kino abanoonyeresa bakiyita Rock Phosphate mu mpapula z'amawulire n'ebirala.

## Obulungi bwe'ekigimusa kino eri abalimi

Okunoonyereza kulaga nti ekigimusa kino kya PR tekirina njawulo nabigimusa birala. Okugeza, okunoonyereza okwakolebwa mu Kenya nga kukolebwa aba World Agroforestry Center (ICRAF) ne Kenya Agricultural Research Institute (KARI) kwavaamu ebirungi bingi nyo ngera bw'ekilagiddwa mu kifananyi.

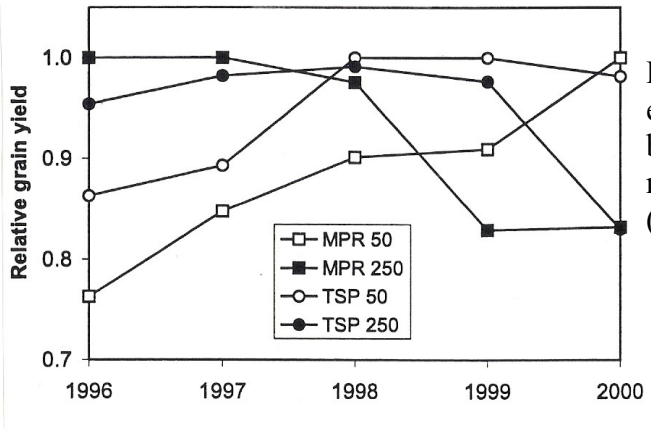



Fig. 1. Amakungula ga kasooli mu bbanga ery'emyaka etaano mu bugwa njuba bw'eKenya nge ttaka olitadde mu phosphate rock MPR oba TSP buli musiri kilo 250 (250 kg).
(Smithson, *et al*., 2001).

Okutwalira awamu emigaso gy'ekiriisa kino eri abalimi nga kikozeseddwa butereevu gisinziira ku bintu bina era nga byebino:

1. Ekika ky'ekigimusa kino ekya PR ky'obeera okozeseeza.
2. Ekika kye ttaka mu nnimiro.
3. Ekika ky'ebimera.
4. Obukodyo obweyambisibwa mu kulima oba engeri ettaka gy'erikuumwamu.

Omugaso gw'abuli kimu kw'ebyo byetulabye waggulu gunyonyoddwa wansi:

1. **Ekika ky'ekigimusa kino ekya PR ky'oba okozeseza**

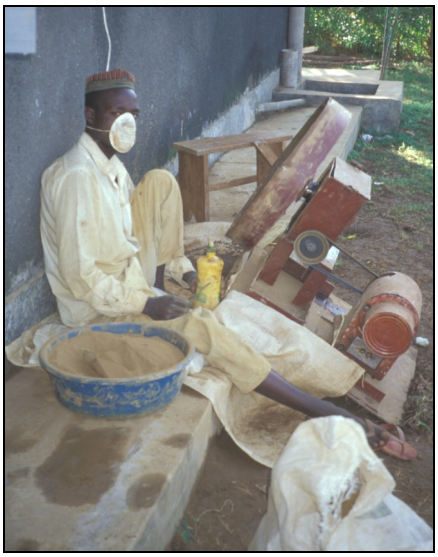
Waliwo ebika bya PR bisatu mu buvanjuba ne mu maserengeta ga Africa ebisobola okukozesebwa olwokuyamba abalimi.

- Sedimentary phosphate deposits.
- Igneous phosphate deposits.
- Guano phosphate deposits.

Ekirombe ky'e Mijingu e Tanzania.

*Sedimentary PR* okugeza y'asangibwa mu Minjingu PR mu mambuka ga Tanzania, mulungi nyo era akola bulungi asobola n'okwetabula bulungi mumazzi. Mulungi nyo mu kwongera ekiriisa kino ekya fosifeti mu ttaka.
Ky'amazima okunoonyereza kulaga nti okukozesa ekiriisa kino ekya PR kuvuddemu ebirungi bingi okufaananako noyo abakozeseza ebiriisa ebirala nga TSP nga bwekirabikira mukifaananyi/grafu (Fig 1):

*Igneous PR deposits*
Kino ekigimusa obutafanana ko na kye sedimentary fosifeti ekimerenguka mangu mu mazi ng'okittadde mu ttaka era kikola bulungi ng'okikozeseza buterevu mu ttaka. Ekyokulabirako Busumbu PR ekisangibwa mu buva njuba bw'e Uganda tekimerenguka mangu kisana okw'ongera okulongoosa mu ng'obadde okikozeseza oryoke kigase ebimera. Abanonyereza n'abalimi bangi begezeseza enkola y'ekigimusa kino ekya igneous PR nokutambula ku mutindo gwa kyo nga bakitabika n'ebigimusa ebirala ebiva mu makoola agavunze, okukitabika n'obugimu obuva mu busa bw'ente.



Pelletizer ng'akozesebwa okulongosa Busumbu PR mu Uganda.

*Guano phosphate deposits*
Bino biva mu bubi bw'obuwundo oba ebinyira oba kalimbwe w'ebinyonyi bino biyamba mu kufuna ekigimusa kya fosifeti. Guano ono ava mu buwundo abeera mutono omunji asangibwa kumbalama z'enyanja mu Tanzania, e Madgascar n'ekubizinga e Seychelles. Guano ava mubinyonyi mwangu wa kufuna era abeera mwangu n'okutambuza engeri asinga gy'asangibwa ku mbalama ze nyanja. Newankubade ebirungi biri mu guano, okumusima kisobola okubeera ekyakabi eri obutonde era wabulabe eri abo abamusima.

## 2. **Embeera yettaka**

Ekika kye ttaka kisobola okulemesa ekigimusa kino ekya PR okugasa abalimi, mungeri endala, enkozesa y'ekigimusa kino ekya PR tejja kugasa nyo singa embeera y'ennimiro tesiba nabika bya ttaka bino.
PR amerenguka mangu era P n'afunika mangu ebimera ebiri mu ttaka:

- lya asidi (pH 5 to 6).
- erilimu calcium mutono.
- elirina okuba ne fosiferasi mutono.

3. **Ekika kye bimera ebirimibwa**

Nga bwe kiragiddwa mu ku nyonyola okusooka, P wamugaso nyo mu kukuza emirandira n'okukuza ebimera nga bigimu.
Obusobozi bw'ebimera mu kusika oba okugya P mu PR nga muno mulimu:

- Clover
- Kale or rape (sukuma wiki)
- Cabbage (emboga)
- Pigeon peas (egobe)

Ebimera ebirala n'omuddo ogw'omunsiko nga mulimu Tithonia diversifolia (Mexican sunflower) bisobola okwongera okumerenguka kwa PR. Ebimera ebisinga eby'ensigo ne ppamba birina obusobozi butono okugya P mu ttaka.

4. **Engeri ez'enjawulo ettaka gyerikumibwamu**

Engeri ez'enjaulo ettaka gyerikumibwamu okugeza nga – okutereezaamu obutereeza, okupima ekisera ekitufu w'akozesezebwa kisobola okufula. Engeri eyongedde okukubaganyizibwako ebirowoozo era ebizulidwa nabyo biragidwa muno mu katabo.

## Birungi ki ebiri mu kukozesa PR?

Omulimi yandyagadde okumanya lwaki yandikozeseza PR  mukifo kyebigimusa ebirala ebya fosifeti nga DAP or TSP. Oluvanyuma lw'okunoonyereza okw'amanyi, era n'okugezesa okwamanyi mu nnimiro mu bitundu by'ebuvanjuba n'emu maserengeta ga Africa, tuyize nti waliwo emigaso mingi nyo mu kukozesa PR. Emigaso egisinga obukulu gyegino :

- Emiwendo gyawansi – siwa bwereege.
- Okozesa bintu ebyabulijjo.
- Alwawo nyo okuggwa mu ttaka.
- Tewali malagala malala g'etaagisa mu kubikola ebigimusa bino.

**Emiwendo gya wansi**

Abalimi bangi bakiriza nti ettaka lyabwe teririna biriisa bimala era nti baganyulwa nyo mu kukozesa ebigimusa bya nitrogen ne fosifeti. Naye ate ebigimusa ebitundibwa mu madduuka bya bu wanana era tebasobola kubigula. Ebigimusa lwaki byandibadde ebye bbeeyi bw'ebityo ?  Okuddibwamu kuli nti babigya mu nsi z'ebweru. Ebigimusa ebitundibwa mu Uganda babigya mu South Africa, Jordan, Norway, ne munsi endala nga America ne Japan !! Babireetera mu bidyeri/maato okutuka ku myalo nga e Mombasa gy'ebigibwa ne bileetebwa mu ma motoka okutuka ku balimi mu Uganda. Entambula eno yonna etwala sente era ereetera emiwendo okulinyisibwa muUganda.

Ogumu ku migaso emikulu gy'ekigimusa kino ekya PR guli nti tekseerebwa nga biri ebirala ebigibwa emitala wamayanja. PR agibwa mu bintu byaffe wano era teyetagisa kutambula ngendp mpanvu kino ne kiyamba okussa emiwendo gye. N'ekrala PR teyeetaagisa kutwala oba kuyita mu makolero ekyo nakyo n'ekiyamba okussa ku miwendo gye.

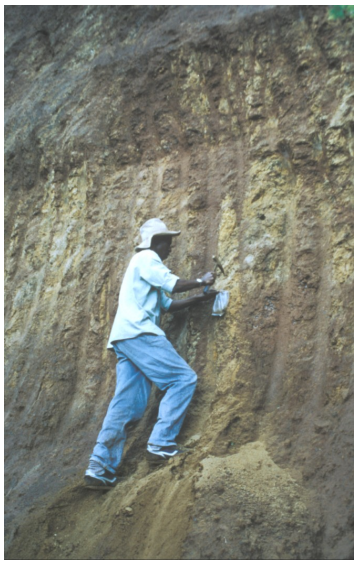
Okwekenenya emiwendo gyebigimusa P ne PR ebirimu kitundu kyaffe nga kw'akolebwa ba Rocks for Crops Project partners. Emiwendo egirabwa mu fig. 2 (wansi) obuseere bw'ekigimusa P ng'okigeregeranyiza ne PR wamu n'enjaulo mu miwendo okwetoloola ekitundu kyonna.

| EKIFO | EMIWENDO GY'EKIGIMUSA FOSIFETI P MU DOLA BULI KASAWO AKA KILO 50 | EMIWENDO GY'EKIMUSA KYA ROCK FERTILIZER PR MU DOLA BULI KASAWO AKA KILO 50 |
|---|---|---|
| Mombasa, Kenya | $20.75 DAP<br>$19.55 TSP | |
| Nairobi, Kenya | $ 19.00 DAP<br>$ 21,00 TSP | $7.25-$10.50 Mijingu phosphate rock (MPR) |
| Ebugwa njuba bwa Kenya (Western Kenya) | $23.70 DAP<br>$21.70 TSP | $15.80 MPR |
| Tanga ne Dar es Salaam, Tanzania (nga bwatundibwa Tanzania Farmers Association, TFA) | $19.00 TSP | $6.00 MPR |
| Kampala, Uganda | $24.75 TSP<br>$24.75 MOP | Teturina |
| Zambia | | |
| Tunisia ne Morocco | $ 9.50 | |

* Wetegereze: Emiwendo mu basubuzi kyenkana gy'egimu naye ate mu maduka ate negiba nga tegifaanagana oba sigyegimu.

Fig. 2. Emiwendo mu kitundu kyona.

## Ebigimusa ebikolerwa wano



Ekirobe kya PR e Busumbu mu Uganda.

Singa abalimi basalawo okukozesa ebigimusa ebikolerwa wano (PR) okusinga ebyo ebigibwa emitala wamayanja, kiyinza okubaviiramu ebirungi matendo bo ng'abalimi nebitundu byabwe okulakulana. Abalimi bafuna ebigimusa ebitali bya bbeeyi okutambula ku byobulimi bwabwe n'okwongera okukulakulanya. Okumutunda kiretera abantu b'omubitundu okufuna emirimu n'okukola emirimu emirala omusobola okuva ekiguliro magale eddiba.

Ng'era bwetulabye, ebigimusa bino bisangibwa mu maserengeta n'ebuva njuba bwa Africa. Ekyokulabirako ebirombe bivumbuddwa mu buva njuba bwa Tanzania mu Luwonkowonko (Rift valley). Ebigimusa PR ebiva e minjingu bigonvu ebimerenguka amangu ate nga bikola bulungi.

Ebigimusa ebirala ebya igneous kulw'obulungi bwabulimi, ky'avumbulwa kitundu kye Mbeya mu Tanzania. Naye nga kino tekimerenguka mangu kwetambula mu ttaka mangu. Ekigimusa kino tukisanga n'e Busumbu mu buva njuba bwa Uganda okumpi n'ensalo ya Uganda ne Kenya. Ekigimusa kino tekimerenguka mangu naye okunoonyereza kulaga nti kya mugaso nyo oba kigasa nyo ebimera nga kikozesebwa. Ekirombe ekirala omusobola okuva ekigimusa kino kisangibwa Sukulu. Songa ate mu Zambia, okunoonyereza kwakolebwa mu Chilembwe fosifeti ekisangibwa mu kitundu province y'ebuva njuba. Sikirungi nyo naye kisobola okulongoosebwa n'ekyongerwa kumutindo.

**Okulwawo mu ttaka**

Omulimi akozesa ekiriisa kino ekya fosifeti (P) mu nnimiro ye emirundi egisinga akikozesa kutandikwa y'okusiga ebimera byo bisobole okufuna ekigimusa kino ekya (P). Bwekiba bwe kityo omulimi ng'asazeewo okukozesa ekigimusa kino ku ntandikwa y'amakungula, kisobola okumukolera  oba okukola okumala ebbanga lyamyaka nge'esatu. Kino kibaawo lw'ansonga nti PR akola mpola era asobola okwongera kubungi bwa P mu ttaka mu kiseera ekiwanvu. Ekigimusa tekyetaagisa kugula buli lw'wogenda okusiga n'oteeka mu ttaka kino kiyamba okukendeeza ku nsimbi nekubakozi omulimi beyandyetaaze okukozesa.

**Okumukola**

Okukola ekigimusa kino wetaaga okukozesa eddagala eddala ekyongera kumuwendo oba ku ssente ezigula ekigimusa kino. Eky'okulabirako ekigimusa kya NP (nitrogen phosphate) kyesigamisibwa ku kubaawo kwa ammonia ava mu natural gas ekyobugagga ekitalabika. Okukola kuyamba ekigimusa okumerenguka mangu era kyanguyila abalimi okumukozesa naye kino nakyo kilinyisa omuwendo. Ekigimusa kya PR tekyetagisa kukikola okujako kumusa naye ate nga akola bulungi nyo nga ebigimusa eby'ebeeyi nga bwetulabye mu miwendo waggulu (Fig 2). N'ekilala, ekigimusa kya PR tekyokya emirandila gye'ebimera nga ebigimusa ebilala.

## Ebizibu ebiva mu kukozesa fosifeti w'njazi (PR)

Newandubadde nga PR alina emigaso mingi nga bwe tulabye naye kizuuliddwa nti PR abalimi bamwemulugunyako okuba n'ebizibu bino wammanga:

- **Alimu enfuufu**:

PR nga amaze okusekulwa avaamu enfuufu nyingi. Kino kitegeeza abalimi bwebaba bamukozesa asobola bulungi nyo okufuuyibwa empewo.

- **Alwawo okukola**:

Nga bwetwayogedde emabegako, PR akozesebwa buteereevu. Ate ku ludda olulala, ebigimusa bya PR ebirala byetaaga okukyusibya mungeri endala okwongera ku nkola yabyo. Kino kiyinza okwetaaga okugezesa oba okukozesa ebikozesebwa byettaka ebirala nga obuzimu bw'ebikoola ebibisi nga Mexican sunflower, era nga byetaaga abakozi bangi. Abamu era bemulugunya olw'okulwawo okukola kwa PR era ng'alina okwetabula kwa mpola.

*Tithonia diversifolia,* ekiyitibwa Mexican sunflower kimera ku mabbali genguudo era kirina ebiriisa bingi.

- **Engeri y'okumusanga**:

PR talabikalabika era muzibu okunonya n'okusanga mu maduuka g'abalimi baffe newankubadde ng'ava mu bintu ebikozesebwa mu bitundu byaffe. Ab'amaduuka abamu bayinza obutamutuunda nga bw'akyali omupya ku katale ate nga tamanyiddwa nyo era tebannaba kumukubira nyo katale.

- **Obuseere/omuwendo**:

Wadde nga PR alabikanga ali ow'obuseere okwenkana ebika by'ebigimusa ebirala, naye abalimi abakaluubiriza okugula.

## Engeri y’okukwatamu obuzibu obuleetebwa PR

Entekateeka zikoleddwa okusobola okukendeza ku buzibu obuva mu kukozesa PR n’okwongera ku mutindo gwe olwo abalimi basobole okumukozesaako obulungi. Eky’okulabirako:
Abakugu n’abakola eby’okunonyereza bavumbudde ekyuma ekyangu ekiyitibwa pelletizer era nga kino kikola okugabanyizibwamu kw’ekigimusa kino. Okumenyamenyamu/okusa kuno kumuleetera obutabaamu nfuufu era aba mwangu okukozesa okusinga oli omusekule obusekuzi. N’abanonyereza e Kenya mu Moi University e Eldoret bakozeeyo ekitereke kya PR ajja okuyamba abalimi mu kumalawo obuzibu b’obutaba na fosiferasi era nga alimu ekika kya PR ekirala ekirungi ekiyitibwa Munjingu. Abanonyereza bafubye nyo okussa emiwendo wansi engy’ekiriisa kino n’okulinyisa omutindo gwakyo olwo abalimi bakiganyulwemu.

Ekigimusa kino ekya PR bakitunda mu maduuka mu kitundu kyo? Bwe guba nga si bweguli, gezaako okunonyereza olabe oba ebitongole ebyobwannakyewa nga birina ekiriisa kino oba okubuuza abakugu b’ebyobulimi oba basobola okuzuula wa we bayinza okujja ekigimusa kino. Obutabo obwogera  ku kiriisa kino busaana okubaamu endagiriro eraga ebifo wa abalimi b’okola nabo we bayinza okujja ekigimuza kino. Tusuubira bongera okukozesa ekiriisa kino ekya PR obungi bwakyo bujja kweyongera era awo n’ebifo omutundirwa ebigimusa bino byeyongere.

## Engeri y’okukozesaamu ekigero ekigasa ekya PR ensangi zino

Nga bwe tuzze tukubaganya ebirowoozo, ekigimusa PR kiyinza okulabika mu ngeri nyingi ezenjawulo okusinziira ku kiki ekiri mu kitundu kyo. Kirabika nga kati eby’okulondako wammanga biri eri abalimi ababeera beetaaga okugula n’okukozesa PR.

1) PR akozesebwa obutereevu: Minjingu PR okuva e Tanzania (era alabika mu bitundu ebimu mu Tanzania, Kenya ne Uganda)

2) PREP-PAC: Ono y’akolebwa abanonyereza mu University ya Moi e Kenya. Ekiriisa kino kirimu kiro 2.0 eza MPR, gulamu 200 ez’omusulo, ensigo z’ebimera ebiyamba okugimuza ettaka ne nitrogen, n’ebintu ebirala bingi. Endagiriro ey’okubikozesa kweri bulungi mu nnimi zaffe ezaawano. Ekikapu kigendeererwa kuyamba nebyo ebyetagisa mu nnimiro ebiraga embala embi nga biteekaamu fosiferasi, P, n’ebigimusa by’akolagana nabyo obulungi ebyomuttaka.

3) Ekika ekirala kiyitibwa Chilembwe PR era nga ono mulongooseemu mu ngeri enungi. Ono asangibwa mu Zambia okuyita mu Univaasite ya Zambia.

4) Ebigimusa eby'ebirungo: Kino nkola mpya era nga ekyakolebwako abakugu abeefubiridde okwongera ku bintu ebiyamba omulimi nebimera era bano bali Nairobi. Ekitongole kino kibadde kikola ne Minjingu webasima eby'obugagga ebyo muttaka, era nga bakola ebigimusa bino n'ebipimo ebirungi ebiyamba ettaka era nga bakozesa amageze mangi ag'ebyobulimi. Ekigimusa kino tebakiseera era nga banonyereza kubyuma nga pelletizer okukola ebyanguyira abalimi okukozesa. Okugezesa kati kugenda mu maaso e Kenya ne Tanzania era nga beyongera okukola obulungi.

Ebibeera mu PREP-PAC

5) Engeri endala eziyinza okweyambisibwa: Bw'oba tosobodde kufuna PR mu kitundu kyo, gezaako okukolagana n'abakulira eby'obulimi mu kitundu kyo. Bangi abakoze ku kunonyereza ku kigimusa kino era bayinza okuba abeetegefu okukolera awamu naawe, n'abalimi, ebitongole ebya banakyewa n'omuntu yenna.

- Obuvanjuba n'amaserengeta ga Africa: ebitongole nga World Agroforestry Center (ICRAF) ne ba Tropical Soil Biology and Fertility Program (TSBF). Bino byombi bikola n'abantu munsi nyingi.
- Kenya: Kenya Agricultural Research Institute (KARI), Kenya Forestry Research Institute (KEFRI), Kenya Institute of Organic Farming (KIOF)
- Uganda: National Agricultural Research Organisation (NARO), Uganda Forestry Authority (UFA), Kawanda Agricultural Research Institute (KARI)
- Tanzania: ebitongole ebinonyereza ku by'obulimi nga ARI Mlingano, mu buvanjuba ne mumassekkati; ARI Selian, Northern Zone, ARI Ukiriguru, Lake Zone, ARI Naliendele, Southern Zone. Ebirala bye Uyole for the Southern Highlands Zone ne Tumbi for the Western Zone.
- Zambia: Kasisi Agricultural Training Center.

## Bipimo ki ebya PR ebyandikozeseddwa?

Eno yenkola eyawamu eyeyambisibwa era eyinza okukozesebwa okwongera ku fusiferasi, P, mu ttaka eritamulina nga ekigimusa PR kikozeseddwa. Mu Tanzania, Kenya ne Uganda, PR alabika era asinga obulungi kati ye Minjingu PR.

***Enkozesa ya PR enyangu**

1. wiiki ssatu oba nya nga enkuba tenaba kutonya, teeka kilo nga 50 mu buli musiri nga ogasse mu ebikoola ebibisi oba ebikalu bya Mexican flower. Kino kijja kugabanya kilo 22-25 eza fosiferasi buli musiri era nga kino kye kigero ekituufu ekya kasooli.
2. saasanya bulungi era otabule bulungi ekiriisa kino mu ttaka.
3. enkuba bw'etandika siga ensigo zo nga bulijjo.

## Abalimi bandikozesezza batya ekigimusa kwa PR okusobola okukiganyulwamu?

Kirungi okujjukira nti fosiferasi kye kimu ku biriisa ebisinga okwetaagibwa olw'okukula obulungi, okuba n'ettaka eggimu era n'amakungula agoomuyiika. Tetuyinza kwerabira migaso gya nitrogen, (N), ne potassium (K), awamu n'ebiriisa nga calcium (Ca), ne magnesium (Mg) n'ebiriisa ebirala ebitalabika namaaso gabantu. N'olwekyo mungeri y'okufunamu okwannamaddala, ebikozesebwa by PR birina okukozesebwa abalimi; n'ekirala balina okukozesa obusa, ebisubi ebyennimiro n'ebigimusa ebirala bingi ebituli okumpi ebiva mu nnimiro zaffe. Bino bijja kwongera ku bugimu obwetagibwa ebimera era n'okuyamba okuzimba ekikula kyettaka.

Enkozesa ya PR tekijjawo kukuluggusibwa n'okwonooneka kwe ttaka. Kitundu butundu kw'ebyo ebiyinza okukolebwa ebizuuliddwa era ebyettanirwa. Bino byebiyamba omulimi owabulijjo. Abalimi balina okukubirizibwa okufaayo okukuzesa endabirira ennungi n'ennima enyonjo.

## Okugabanira awamu n’abalimi ku mawulire agakwata ku kigimusa ekya PR

Bino bye bimu ku birowoozo ebyandyeyambisiddwa mu kugabanira awamu n’abalimi amawulire agakwata ku kigimusa kino ekya PR.

- Okutegeka omusomo abalimi nebamanyisibwa ku kigimusa kino ekya PR.
- Okutegekayo olunaku lw’abalimi nebalagibwa enkozesa y’ekigimusa kino.
- Abalimi okukyaliragana naddala abo abakozesa ekigimusa kino nebakyalira abo abatakirina naye nga bandyagadde okukikozesa.
- Okuteekawo okunonyereza ng’abalimi bakozesa obulimiro bwabwe okusobola okuzuula engeri gye baganyulwa mu kukozesa ekigimusa kino, n’ebigimusa ebirala byebaba bakozesa.

Enkola nyingi eziyinza okukozesebwa okusomesa abalimi ku ngeri endala ez’okulondako okusobola okwongera ku fosiferasi mu nnimiro. Kikulu nyo okukuuma amagezi gano bulungi. Nekirala, kintu kikulu nyo okwagazisa abalimi okuba n’omukisa okuyiga nga bwe bakola, okubuuza ebibuuzo bwe baba nabyo n’okugabanira awamu amagezi n’obumanyirivu.

## Okwejjukanya

Mu katabo kano tuyize eby’okuyiga ebikwata ku kigimusa kya fosifeeti ekiva mu njaziyazi era netukubaganya ebirowoozo ku ngeri ezisingako obulungi awamu n’enkola ennungi. Wayize ku birungi ebiri mu kukozesa y’obugimu PR n’omugaso bwagwo wegukoma. Twawadde okwonyonyola okulungi okw’ebika by PR ebikozesebwa kati, enkozesa gyebamukozesaamu, era ne twogera n’engeri gyoyinza okumufunamu obulungi. Ekisembayo, tumenye engeri gyetuyinza okugabanamu ebirowoozo ebyamagezi ebikwata ku nkozesa y’ebigimusa awamu n’abalimi.

For more technical and country-specific information about PR and agrominerals, please consult *Rocks for Crops*, which is available online at http://www.uoguelph.ca/~geology/rocks_for_crops/

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