

COTTON IN ZAMBIA

AGRONOMICAL PRACTICES AND PEST CONTROL

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F O R E W O R D

Cotton production in Zambia over the past ten years has continuously increased. But this situation is only due to the increase of the hectareage under cotton.

And, in fact, the average seed-cotton yield has stagnated around 600 kg/ha - a very low level - varying according to the rainfall patterns only.

To achieve better yields, it is necessary that the crop management be considerably improved. This is the only solution which will result in a further increase of the national production together with better profits for farmers.

So, we the authors, members of the Cotton Team and LINTCO thought that a booklet gathering some basic recommendations on agronomical practices and pest control could be a useful tool for the extension staff, the cotton growers and that it will help boost cotton production.

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A I M O F T H E E X T E N S I O N S E R V I C E S

Before we outline the most important aspects of cotton production, we feel that it is important for the extension man to know what is expected of him and for the farmer to know who to approach in times of difficulties.

An extension service must play six different roles that are appropriate singly or in combination :

1. EDUCATION is the central objective : to help farmers master new information and develop new skills.
2. VACUUM : extension workers must help with any local rural task relevant to agricultural production and marketing that is not being effectively done by someone else.
3. CONNECTION RESEARCH - FARMERS : extension workers take the research results (improved practices) to farmers and must inform research about all the farmers problems. And they must take into account all the other sources of useful technology.
4. FARMERS ASSISTANCE : the subsistence farmers need the continuous help of the extension workers who, with their technical and moral support, play the role of an encouraging companion.
5. TRAINING FARMERS IN DECISION MAKING : extension workers don't try to persuade farmers to adopt a particular line of action but they only help farmers consider all the alternatives in order to make their own decision.
6. PUSH PRODUCTION OF PARTICULAR CROPS : this legitimate objective is only valuable when what is being recommended is also to the financial advantage of the farmer and of the national economy.

These objectives overlap.

But, Zambia has many different kinds of agriculture and, according to the situation found by the extension worker, some objectives may appear more important than others.

So, the question " what are the tasks of agricultural extension ?" has different answers.

This very important question is the one that the good extension worker asks himself always.

AGRONOMICAL PRACTICES

/----- CHOICE OF THE LOCATION

- > PLACE A flat and uniform field (no trees...) is the best.
- In undulating areas, a strip at a right angle to the slope reduces the hazards of soil erosion.
'As Cotton demands a continuous check, the field should not be too far from the farm houses.
- > SOIL Avoid the places susceptible to endure water-logging or flooding.
- \-> ROTATION A Maize - Cotton Rotation is advantageous :
the fertilizer given to Maize is usable by Cotton during the next season.
- A continuous cotton-planting for several seasons on the same place will result in a fall of soil fertility, favours soil erosion, and facilitates pest and disease build-up.

/----- AROUND PLANTING TIME

- > PLOUGHING Done when the first rains come, it opens the soil to air and moisture, and breaks the big particles.
- \-> SOWING Every measure should be taken to ensure good germination conditions :
- WHEN ? Plant between mid-November and mid-December.
- Don't wait after ploughing : if a drought period follows the tillage, some sandy-loam soils quickly form a crust at the surface, which is very harmful to emergence.
- EARLY PLANTING (EVEN DRY) IS ALWAYS BETTER
 A delay of one month in planting can reduce yield by a half !
- \- HOW ? * Hand-Drilling after a plough or a cultivator seems to be a common practise. But, planting depth is definitely impossible to control in this case.
- * Hand-Station-Planting is more regular : every 30 cm (1 foot) on a line, sow 5 seeds in a hole (the station) and cover. It is easier to have a GOOD UNIFORM PLANTING-DEPTH : 2 cm.
- 90 cm is the widest distance between 2 lines.

/----- AFTER EMERGENCE

The farmer must keep a close eye on the emergence of his cotton plants. According to the conditions of moisture and soil structure, the result is very fluctuating. The fact is that emergence is often very irregular and poor after a hand-drilling.

-> GAPPING The farmer must fill the gaps which appear during emergence time with extra.

AN EARLY GAPPING IS ESSENTIAL :
GIVING A UNIFORM PLANT POPULATION, THE PRODUCTION WILL BE MUCH HIGHER.

\-> THINNING Must be done within the 3 weeks after emergence.

- After drilling, leave 1 plant every 15 - 30 cm
- After station-planting, leave 2 plants/station

If the farmer waits too long, the unthinned plants exert the same influence on the developing crops as weeds do.

It is a good practice to do the thinning at the same time as the first weeding.

/----- DURING THE COTTON GROWTH

\-> WEEDING Cotton is a very sensitive crop to weed infestation all along its period of development. Weeds represent a very aggressive competition for :

- soil nutrients,
- soil moisture,
- light

which are essential for the healthy formation of all the vegetative and reproductive organs.

So, a very infested cotton becomes "leggy", with less branches, flowers and bolls.

- WHEN ? AS EARLIER AS POSSIBLE.
One month delay in the first weeding can reduce the yield by at least 60 % !

The first weeding must be done 2 weeks after emergence.

The following ones are done fortnightly.

\- HOW ? Farmers should do a mechanical weeding (with a plough or a cultivator) followed by a hand cleaning.

To be really efficient, the weeding must leave the field perfectly clean.

/----- AROUND HARVESTING TIME

-> HARVEST

- WHEN ? 1st PICK : 3 to 4 bolls are open on each plant
- 2nd PICK : sufficient extra bolls are open
- 3rd PICK : remaining bolls are open

 If the farmer waits until all bolls are open, this leads to yield loss and lint quality deterioration due to late season rains, dust and honeydew.

- \- HOW ? NEVER PICK WHEN WET OR DAMP -not early morning
- PICK ONE GRADE AT A TIME - A for picks 1 & 2
- DO NOT MIX THE GRADES
- USE ONLY NATURAL FIBER BAGS - jute bags
- neither Polythrene nor "Mealie Meal" bags

- > STORING The jute bags filled with seed-cotton must be kept in the house in a clean shelter.

- \-> STALKS All the cotton stalks must be cut in the fields by 1st of October.

NOTES :

A - RIDGING

Some farmers are used to do ridges in their cotton field. It's a good practise for 2 reasons :

- 1 - Better cotton behaviour according to soil moisture:
 During rainy periods, the cotton is not flooded;
 During drought, ridges conserve moisture easily.

- 2 - Slowing down of the weed infestation.

B - FERTILIZATION

The Cotton growers must know that, when the above practises are well done, fertilizer application may DOUBLE THE PRODUCTION and still maintain a good level of field fertility.

The fertilizer recomandation is :

- Basal Dressing > 200 kg/ha (50 kg/lima) of "D" Compound broadcasted just after planting;
- Top Dressing > 50 kg/ha (13 kg/lima) of Urea applied when the first flowers appear.

CONCLUSION :

Cotton is a crop which demands great care from the farmer in terms of management practice. But, the cotton management, is often in competition with food-crops (Maize, vegetables...).

The farmer must remember that every practice on cotton has a big influence on production, consequently on profits expected :

GOOD PRACTICES = BIG PROFITS / BAD PRACTICES = POOR PROFITS

C O T T O N P E S T C O N T R O L

1 * SPRAY PROGRAMME :

The standard spray programme in Zambia is as follows :

2 sprays of SOLUBOR at weeks 3 and 5 after cotton emergence;
then 3 sprays of CHEMICAL + SOLUBOR at weeks 7,9,11;
then 2 more sprays of CHEMICAL ALONE at weeks 13 and 15.

This method, introduced in Zambia in 1970, is easier to use than the control method based on scouting.

THE CHEMICAL IS USUALLY FOR BOLLWORM CONTROL.

SOLUBOR IS NOT AN INSECTICIDE AND DOES NOT CONTROL APHIDS OR BOLLWORMS; SOLUBOR ACTS LIKE A FERTILIZER AND PREVENTS BORON DEFICIENCY ONLY.

Boron is an element required for the growth of cotton.

In case of heavy aphid infestation, the application of an aphicide like Dimethoate is advisable.

2 * SPRAYING EQUIPMENT :

Today, the knapsack sprayer (10 or 15 or 20 litres) is the most common in Zambia; the electrodyne sprayer (ED sprayer) is also present in some places.

The ultra low volume (0.5 to 3 litres of spray solution / hectare) and the low volume (5 to 15 litres of spray solution / hectare) are not developed at the small farmer s' level.

3 * QUANTITY OF SPRAY SOLUTION TO APPLY PER LIMA :

IT DEPENDS ON THE SIZE OF COTTON, THE FLOW RATE OF THE SPRAYER AND THE WALKING SPEED.

For knapsack sprays, the number of 15 litres sprayers to apply PER LIMA and PER SPRAY seems to be :

-> SMALL COTTON (less than 40 centimetres high) :

ONE 15 litres KNAPSACK SPRAYER PER LIMA (4 per hectare)
= 15 litres of water per lima

-> AVERAGE COTTON (40 to 90 centimetres high) :

TWO 15 litres KNAPSACK SPRAYERS PER LIMA (8 / hectare)
= 30 litres of water per lima

-> BIG COTTON (over 90 centimetres high) :

THREE 15 litres KNAPSACK SPRAYERS PER LIMA (12/hectare)
= 45 litres of water per lima

4 * FLOW RATE OF THE SPRAYER :

A sprayer with one nozzle should give between 0.5 and 0.9 litre of spray per minute.

5 * WALKING SPEED WHEN SPRAYING :

It depends mainly on the size of the cotton, as the number of sprayers per lima increases with the size of the cotton (see above).

- BRISK WALKING SPEED :

For SMALL and AVERAGE cotton, it should be of about :
1.5 METRE PER SECOND (= 5.4 KM PER HOUR) and ONE LIMA should be sprayed in 20 to 30 MINUTES.

- SLOW WALKING SPEED :

For BIG cotton, the speed should be ONE METRE PER SECOND
(= 3.6 KM PER HOUR) and ONE LIMA should require 45 MINUTES.

The most important for the farmer is to know HOW MANY sprayers he applies PER LIMA and to be as close as possible of the quantities of spray solution suggested above.

RECOMMENDED CHEMICALS FOR COTTON PEST CONTROL IN ZAMBIA (1989)

Are given thereafter the commercial name, the name of the active ingredient and the quantity of chemical to use per litre and per 15 litres of water :

FOR BOLLWORM CONTROL ONLY :

NAME	ACTIVE INGREDIENT	MLS/LITRE	MLS/15 LITRES
CYMBUSH 25 EC	cypermethrin	1.5	22
DECIS 3 EC	deltamethrin	3	45
FASTAC 10 EC	alphamethrin	1.5	22
KARATE 2.5 EC	cyalothrin	5	75
RIPCORDER 30 EC	cypermethrin	1.3	20
SUMICIDIN 20 EC	fenvalerate	3	45
KARATE 2 ED	cyalothrin	1 bozzle for 1 lima & 5 sprays	

NONE OF THESE CHEMICALS IS ACTIVE AGAINST APHIDS ; they are active against Jassids and Lygus . Stainers are found in Eastern Province and some chemicals are under testing for their control .

FOR APHID CONTROL ONLY :

NAME	ACTIVE INGREDIENT	MLS/LITRE	MLS/15 LITRES
DIMETHOATE 40	dimethoate	5	75
ROGOR 40 EC	dimethoate	5	75
PIRIMOR 50 G	pirimicarb	5 gramms/l	75 gramms/l

Of course these dose rates per sprayer are valid ONLY if the NUMBER of SPRAYERS PER LIMA FOLLOWS THE ABOVE RECOMMANDATIONS.

This is why these dose rates are different from the ones usually found in the cotton pack booklets or technical notices.

These chemicals are the ones commonly available today; new ones or new mixtures of chemicals could be introduced in Zambia in the coming years.

SOLUBOR

For SOLUBOR, the rate is 7 gramms per litre of water
= 100 gramms per 15 litres sprayer.

KUSOLA NZILA ZYACISI ZYAKUSUMPULA BULONGO

/----- KUSALA LUBAZU LWA COOKO

- > LUBAZU ANTELA MBALI MUUNDA KUUYALENE AKUKOZYANYA : kakunyina zisamu. Kanyika katatoli kapati kumungwenyu antela kutanta takapi bulongo kuunka a meenda antela luwo. Mbuli buluba mbobuyanda kubonwa lyoonse, tabweelede kuba kulamfu a ng'anda ya mulimi.
- > BULONGO Tantamuka coonse cibaka meenda ncaayanda kwiima antela kukalila.
- \-> KUCINCA ZISYANGO MAPOPWE KUCINCANYA A BULUBA : Ncecigwasya kapati camutunzya (fertilizer) wakabikidwe mumapopwe mwaka cilila ulabeleka kubuluba.

Kujatikizya kusyanga buluba a mwaka a mwaka a cibaka comwe antela muunda omwe, citola mbolezi ansi mubulongo. Alimwi cipa kuti bulongo buunke a meenda antela luwo.

/----- CASIKA CIINDI CAKUSYANGA

- > KULIMA A NG'OMBE Eeci ceelede kucitwa a mvula yakusaan-guna yaboola, ipakuti bulongo bujaluke kumuwo alimwi mudumo unjile ansi akupwaya makomwe a bulongo.
- \-> KUSYANGA Coonse ceelede kugwasya kukumena kwabuluba munzila mbotu:-

- NDILILI? Kusyanga akati ka vumbi pati a nalupale. Utalindili kwamana buyo kulima kuti kwatobela cilanga kwamana kulima nyika zimwi zisangene a musenga zitalika kupandauka, ono ziya nzibi kukumena kwacisyango. Kufwambaana kusyanga mucivu ciyumu lyoonse ncibotu. Kuti wamuka kusyanga kwa mwezi omwe upa kuti butebuzibu kupe cisela.

\- MBUTI? * Kusyanga a maanza kulosya-losya kwamana kulima kulangika kuti njenzila izibidwe ngubauba ono pesi kusyanga kwakuya ansi masimpe ncintu cimwi cikatazya kucikwabilila.

* KUSYANGA A MAANZA ABUSENA A BUSENA ANTELA KUBELESYA LOOYE NJENZILA IVULA KUBELEKA. Eeci cilabelesyegwa mumulaini a 30cm (antela 1 foot) antela 12 inches, inseke zyosanwe a cilindi comwe-comwe. Wamana wavumbila cilindi ncuubauba. Ncibotu kuba a mapopwe ayelene. Tulindi kuya ansi tuleelede 2cm. Kutantaanisa 90cm antela 3 feet nkokutantaanisa kweni akati-kati ka milaini.

/----- AMANA KUMENA

Mulimi weelede kulanga kapati buluba bwakwe nobucimena. Ik-weelana mudumo uli mubulongo ambobuboneka. Inga mbobulibonya bulalitondezya nkobutapuka. Masimpe ngakuti kumena kwakusyanga a maanza kanji-kanji taameneni antoomwe akutalibonya bubotu pe wana kusyanga a maanza kulosya-losya.

-> KUSYANGULULA : Mulimi weelede kusyangukula mwaatakali kumena oomo mwalibonya wamana kumena. Kusyangukula cilayandika kapati cipa kuti cisyango cikozyane kuvula alimwi inga capa butebuzi bubotu buzwide.

\-> KUJULILA KUSIYA KOMWE-KOMWE : Eeci ceelede kucitwa mumona munsondo zyotatwe kuzwa ciindi nowamena. Wamana kulosya-losya ujwide akusiya comwe-comwe cisiko wainda 15cm antela 30cm (1 foot) uulya uli muzilindi, nkusiya tobile-tobile. Kuti mulimi wamuka kujulila buluba inga bwatalika kulampuluka mbuli mbomubona bwizu bukomenena antoomwe. Ncibotu kapati kubujulila buluba kufwambaana mbutwatalikila buyo kulimina.

/----- CIINDI NOBUKOMENA BULUBA

\-> KULIMINA . Buluba ncisyango citayandani a bwizu muciiindi cakukomena kwaco. Lusyanga lulalya akukazyanya kulibobuya kucisyango:-
- Kulya kujanika mubulongo.
- Mudumo mubulongo:
- A mumuni.

Eezi nzyozipa akubotezya kutalikwa kwakukomena alimwi akuzyala kwazyo koonse. Nkakaambo kaako buluba bwayokela inga kaba buyo "kasamu", kajisi tutabi tusyoonto, malanga-langa masyoonto alimwi a makoto maniini buyo.

-> INO TULIMINE LILI? KUTALIKA BUYO KUFWAMBAABA BWAMENA BWIZU. Kumuka buyo mwezi omwe mukusakwida kutaanzi kulakonzya kutola butebuzi ansi busika ku 60% kusweekelwa. Kulimina kutaanzi kweelede kucitwa insondo zyobile kuzwa buluba nobwamena.

Eezi zicilila waawa zilacitwa lyoonse kwaında nsondo zyobile.

\-> INO ZICITWA BUTI? Balimi beelede kulimina a jamba lya ng'ombe antela a nkofolo nkabela babelesye maanza kusalazya.

Kubona kuti oobu mbwini, balimi beelede kusakwida kubona kuti muunda wasalala, unyina bwizu pele buyo bwizu bwalimwa.

/----- CIINDI CAKUTEBULA

-> KUTEBULA

-> NDILILI ? KUCELA KUTAANZI: Makoto otatwe (3) na one (4) apampanuka asiko lyomwe.

KUCELA KWABILI: Makoto aambi apampanuka.

KUCELA KWATATU: Makoto akasyeede alo apampanuka.

Nkabela kuti mulimi walindila kusikila makoto oonse apampanuka, eeci cicita kuti bulemu bwa buluba buube nkaambo kazuba alimwi akunyongana kumvula ilya yamamanino.

\-> MBUTI? MUTACELI NOKULIKUTETE ANTELA MUDUMO - NOKUBA MAFUMO-FUMO. AMUCELE MUSYOBO OMWE KUCIINDI - Musyobo mubotu kukucela kutaanzi a kwabili.

-> KUYOBOLA Tusaka tujisi buluba bwacelwa tubikwa mun'ganda mucibalu cisalala.

\-> TUSAMU Tusamu toonse twabuluba tweelede kugonkwa mumuunda mubuzuba butaanzi bwa mwezi wa kavumbi kaniini-October 1

A. MIBUNDU Bamwi balimi bazibide kucita mibundu mumyuunda yabo yabuluba. Nciyanza cibotu kutwaambo tobile:-

1. Ncibotu kubuluba akaambo kakupa mudumo kubulongo. Ciindi camvula, buluba tabubbili mumeenda. Ciindi cacilanga mibundu ilayobola mudumo.

2. Cicita kuti bwizu antela lusyanga lutakomeni akunyanga cakulya kucisyango.

B. CAMUTUNZYA Balimi babuluba beelede kuziba kuti, naa ciyanza eeci cacitwa kabotu, kubikwa kwa camutunzya inga kwapa kuyungizya kwabili mukuzyala alimwi akupa bubotu bwambolezi kumuunda.

Camutuzya mwayelede kubelesyegwa:-

- Bulemu bulema 200kg ku hekele lyomwe (50kg kulima lyomwe) wacamutunzya wa "D" Compound ubikwa kwamana kusyangwa mbuli musamu wakunsi.

- Bulemu bulema 50kg ku hekele (13kg ku lima lyomwe a camutunzya wa Urea) ubikwa kwaında mazuba ali makumi osanwe a makumi obile (70 days) kuzwa ciindi buluba nobwamena akubikwa atala.

KUMANIZYA :

Buluba ncisyango cibuzya mulimi kuti acibambe kapati. Pesi bubambwe bwa buluba, kapati kumyeezi mitaanzi yakukomena, eeci cibabobuya kwiında mububambe acakulya cisyaaala kuzisyango mbuli mapopwe a zyamatewo acisyu.

Mulimi weelede kuyeeya kuti ncasoleka kucita kubuluba cijisi bulumbu bupati buti mukukomezya buluba, kweelana a mali ngayakujana.

KUTABILILA TUUKA TULYA BULUBA

1 * KUSANSAILA MBOKUTOBELANA :

Kutalika kwa buzuba buno bwa mwezi uno Miyoba (March) kusan-sailwa kwa buluba mbobuya mbobujatikizya:-

Ziindi zyobile zyakusansaila munsondo yatatu alimwi ayasanu kuzwa ciindi ncobwamena ngu Solubor buyo usansailwa alike.

Kusansaila kumbi kucilila ziindi zyoatatwe ono musamu wakutabilila tuuka kusanganizya a Solubor. Munsondo yaciloba aya fuka kusikila ya kumi akamwi. Musamu buyo wakukwabilila tuuka ootu kakunyina Solubor pe, ulasansailwa ziindi zyobile munsondo ya kumi a nsondo zyoatatwe alimwi munsondo ya kumi a nsondo zyoosanwe.

Eeyi nzila yaaletwa alimwi akupandululwa mu 1970. Kwiinda nzila imwi yakusaanguna kuyakulanga kumuunda kusaanguna noyakusansaila, yalikukatazya.

MUSAMU ZIINDI ZINJI NGWABASYANYONGWA. SOLUBOR TUULI MUSAMU WAKUTABILILA TUUKA TULYA BULUBA PE, TUMA APHID, ANTELA BASYANYOONGWA, NGUCAMUTUNZYA BUYO (FERTILIZER) KUTABILILA BULWAZI BWA BORON KWALIKE. KUKOKONYEKA MATU AMALUBA.

Boron ncimwi cakulya ciyandika mubuluba kuti bukomene kabotu kuti kakunyina busani oobu tabukomeni kabotu buluba pe.

Atwaambe kuti naa tuuka ootu twavula kapati mubuluba tuma aphid malailile mapati ngakusansaila musamu wakujaya tuuka ootu utegwa Dimethoate.

2 * ZIBULO ZIBELESYEGWA MUKUSANSAILA :

Cino ciindi sprayer inyamuna malitazi a meenda aali kumi a osanwe (15 litres) njiivula kujanika kanji-kanji muno mu Zambia. Aaya amwi mbuli Electrodyne Sprayer, ED Sprayer aalo alajanika mumwi mumasena.

Aaya amwi ma Sprayer mbuli ultra low volume, cibweza buyo 0.5 kusikila ku 3 L a musamu wa sanganizigwa kale, mu hekele lyomwe. Alimwi eeyi low volume ibweza 5 kusikila 15 L musamu waabambwa kale mu hekele lyomwe taapegwi kubalimi baniini pe.

3 * MUNJI BUTI MUSAMU Ooyo WEELEDE KUSANSAILWA MU LIMA NGOBATI :

Eeci ciya mbuli muunda mbuukomena wa buluba, musamu mbuyenda a kuzwa mu Sprayer alimwi muntu weendesya buti.

Ino aaya ategwa knapsack sprayers abbalwa buya, aaya taakatazyi kuziba ma sprayer alimwi asansaila munji buti mulima yomwe:

-> Buluba bucili buniini bulampa buyo 40cm antela butasiki 12 inches yomwe buyo sprayer ya 15 litres ninji mulima lyomwe, caamba kuti mu hekele lyomwe ali buyo one (4) ma sprayer amadosi a meenda aali kumi acisanu (15 litres).

-> Buluba bulampa buyo akati-kati ka 40 antela 90cm antela 36 inches antela 3 feet ma sprayer ali buyo obile a malita a meenda aali kumi a cisanu (15 litres) kuma sprayer aalya abbalwa buya mulima lyomwe, kumi a tobile ma sprayer mu hekele lyomwe.

-> Buluba bwakomena bupati bwiinda 3 feet (90 cms) ma sprayer otatwe akumi a cisanu (15 litres) mulima lyomwe muhekele ali buyo kumi a obile makumi one a cisanu a meenda mulima.

4 * KWEENDA WA MUSAMU MU SPRAYER :

Sprayer ijisi kalyango komwe yeelede kupa 0.5 antela 0.9 malita a meenda akusansaila mu minute yomwe-yomwe.

5 * INTAAMO MBOZYEELEDE KWEENDWA CIINDI CAKUSANSAILA BULUBA :

Eeci ciya buyo mbuli buluba mbobuli bupati antela mbobukomena, kusansaila mbokuya kumpela mulima lyomwe-lyomwe. (Inga mwalanga atala).

Buluba busyoonto-syonto antela buli akati-kati, kweenda kweelede kuti kosika 1.5 antaamo mu second yomwe-yomwe. Eeci cilakupa 5.4km antela ba maile lusele (3.5 miles) muwoola lyomwe. Lima lyomwe lyeelede kusansailwa mu maminiti aali makumi obile antela otatwe (30 minutes).

Buluba kwasimpa kukomena, kweenda kweelede kuba ntaamo yomwe mu second yomwe, 3.6km muwoola lyomwe. Ono lima lyomwe liyanda buyo maminiti aali makumi one acisanu (45 minutes):

Cintu buyo cipati kumulimi nkuziba ma sprayer ngasansaila mu lima lyomwe-lyomwe. Alimwi akulangisya kapati kuti sena ubelesya musamu munji buti mbuli kutondezya kupedwe atala aawa.

MISAMU EEYO YAKUTABILILA TUUKA TULYA BULUBA MUNO MU ZAMBIA
IZUMIZIDWE, 1989.

Njeeyi yaapegwa nikwaamana zina lipati. Izina lyaapegwa nikwaamana kulangwa bukali mbujisi alimwi a mbowuvula musamu ubelesyegwa litre lyomwe alimwi amu 15 litres wameenda.

OOYO UTABILILA BA-SYANYOONGWA BALO :

IZINA	BUKALI BUJANIKA MUKATI	MA mls MULITA LYOMWE	MA mls MUMALITA KUMI A OSANWSE (15 litres)
CYMBUSH 25 EC	Cypermethrin	1.5	22
DECIS 3 EC	Deltamethrin	3	45
FASTAC 10 EC	Alphamethrin	1.5	22
KARATE 2.5 EC	Cyalthrin	5	75
RIPCORD 30 EC	Cypermethrin	1.3	20
SUMICIDIN 20 EC	Fenvalerate	3	45
KARATE 2.5 ED	Cyalthrin	Kasena komwe	Mulima lyomwe tosanwe kusansaila

KUNYINA NOUBA OMWE MUSAMU ULI A NGUZU KUJAYA MA APHID PELE
WAKUTABILILA MA APHID ALIKE.

IZINA	BUKALI BUJANIKA MUKATI	MA mls MULITA LYOMWE	MA mls MUMALITA KUMI A OSANWSE (15 litres)
DIMETHOATE 40	Dimethoate	5	75
ROGOR 40 EC	Dimethoate	5	75
PIRIMOR 50 G	Pirimicarb	5gm mulita lyomwe	75g

Masimpe eeni ngakuti misamu eeyi ilakonzya kubeleka kabotu kwiinda mumalailile aambwa atala aawa. Kucilila ma sprayer mbwaabede mu lima. Ncenciceeco ncomubona kuti kuli kwiindana ayiilya misamu njotujana yaabikwa kale mu tubbuku tuya ntotupegwa.

Eeyi njemisamu ijanika munzila ngubauba aano mazuba. Eeyi mipya iciboola misamu isanganizigwa, iya kuboola mumsi mumyaka icizya mu Zambia.

SOLUBOR

Walo Solubor ngu 7gm biyo mulita lyomwe lya meenda. 100gm mu prayer yomwe ya 15 litres a meenda.



- Magoye R.R.Station
- ▲ Point d'appui (4 PA)
- Fermes pilotes (3 sites)
- //// Zone cotonnière