Virtual Field Day – CABBAGE Production

7th May 2020

TOPICS

a. FOCUS ISSUES
b. BENEFITS TO FARMER
   - Farmer Testimonial B Washaya, Bromley
c. SEASON FOR PRODUCTION
d. SEED/SEEDLINGS
e. VARIETIES
f. SOIL ISSUES; type; pH; preparation
g. SPACING BETWEEN ROWS/PLANTS; PLANT POPULATION
h. FERTILIZER USE; MANURE/COMPOST
i. MANAGEMENT UNTIL HARVEST
j. WEED CONTROL
k. PEST CONTROL
l. DISEASE CONTROL
m. DAYS TO MATURITY; HARVESTING; MARKETING

Classification: PUBLIC

ISSUES TO FOCUS ON

1. MARKET RELATED
    a. Open Mbare/Vendor
    b. Supermarket
    c. Flooded / Shortages
2. HEAD SIZE
    a. Farmer's choice - Kg's/head or Physical size
    b. Market related
    c. Determined by: Variety, Spacing, Fertilizer, Water
3. MATURITY (days after sowing / transplanting)
    a. Supply window – flooding / shortage
    b. Variety
4. HEAD QUALITY
    a. Variety
    b. Pest damage
    c. Diseases, e.g. black rot

Classification: PUBLIC

Farmers Comments : Ben Washaya Bromley 05 May 2020

- Watch video on Youtube:
- https://www.youtube.com/watch?v=o6C77jt7fu0

Classification: INTERNAL USE ONLY

BRASSICA FAMILY OF VEGETABLES

- Cabbage is part of the BRASSICA family.
- Vegetables such as:
  - broccoli, cabbage, cauliflower, kale, Chinese cabbage, pak choi.

Classification: INTERNAL USE ONLY

BRASSICAS – BENEFITS FOR FARMER

- No.1 = INCOME
- No. 2 = Use CABBAGE family for crop rotation purposes.
- Aim to plant this sequence:
  - LEGUMES (beans, peas)
  - BRASSICA (cabbage, broccoli, cauliflower, kale)
  - ROOT CROPS (carrots, beetroot, celery)
  - LEAFY GREENS (spinach, lettuce)
  - CEREALS (sweetcorn, babycorn, green mealies)
  - SOLANACEOUS (potato, tomato, peppers, eggplant)
  - ALLIUMS (onions, garlic, leeks, shallots).
  - CUCURBITS (butternut, cucumber, pumpkins)

Classification: INTERNAL USE ONLY

	Bed 1	Bed 2	Bed 3	Bed 4	Bed 5	Bed 6
2017	Legumes	Solanums	Roots	Cucurbits	Alliums	Brassicas
2018	Brassicas	Legumes	Solanums	Roots	Cucurbits	Alliums
2019	Alliums	Brassicas	Legumes	Solanums	Roots	Cucurbits
2020	Cucurbits	Alliums	Brassicas	Legumes	Solanums	Roots
2021	Roots	Cucurbits	Alliums	Brassicas	Legumes	Solanums
2022	Solanums	Roots	Cucurbits	Alliums	Brassicas	Legumes

Classification: INTERNAL USE ONLY

TYPES OF CABBAGE

Drumhead

Sugarloaf

Red

Classification: INTERNAL USE ONLY

CABBAGES HEALTH BENEFITS - EXAMPLES

Real Food For Life

- Cabbages one of the most nutritious vegetables in the world.
- High levels of vitamins C, K.
- High in Sulphur (glucosinolates) - stimulate the immune system, reduce cancer risk.
- Minerals – potassium.
- High in fibre.
- Weight management.
- Consume at least 5 portions per week.

Classification: INTERNAL USE ONLY

SEASON FOR PRODUCTION

- Check expected weather patterns over next 3 months;
  - Hot, sunny and dry
  - Hot and wet
  - Cool and wet
  - Cold and dry
  - Frosty
- CABBAGES generally favour cool to cold weather but with plenty water.
- Cabbages can grow all year round
  - watch out for extreme heat AND too much rain.
- However, due to consumer demands for all-year-round supplies, farmers have to grow the crop off-season and reap high prices.

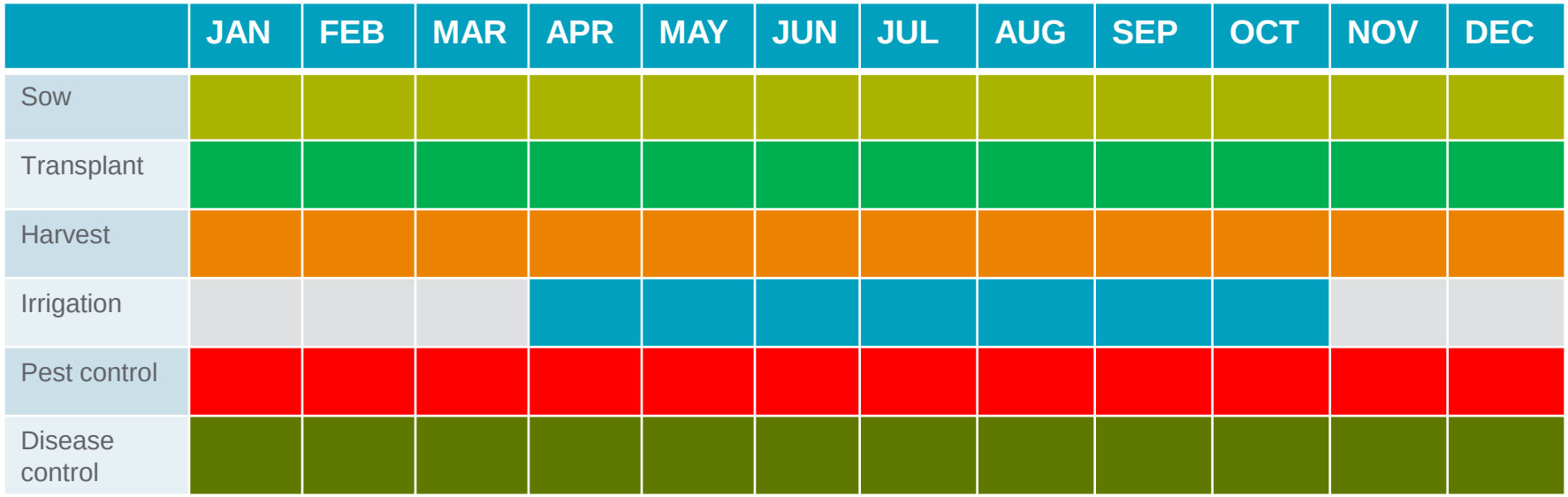
Classification: INTERNAL USE ONLY

TIME OF PLANTING

- The best time to plant a CABBAGE crop is determined mainly by the following:
  - Is it the ideal season weather-wise?
  - Will the harvest coincide with market flooding or shortages?
  - Will diseases, pests or weeds be difficult to control?

Classification: INTERNAL USE ONLY

SEASONAL CALENDAR



Classification: INTERNAL USE ONLY

SEED and SEEDLINGS

- Farmer choice to raise seedlings or buy seedlings.
- Check if seed sold in grams or numbers.
- How many seeds in a grams packet?
- How many seeds in a Seed Number packet?
- 1 hectare = 30-40’000 (<60’000) plants, seedlings or seeds.
- Seeds germinate 3-4 days after sowing
- Seedlings ready at 4-5 weeks after sowing.

Choose the right size seedling

Lack of light

Classification: INTERNAL USE ONLY

OWN SEEDLINGS - PROBLEMS

The ideal seedling is:

- **4-5 weeks old**
- **10-15 cm tall**
- **8 leaves**
- **Well hardened**

Classification: INTERNAL USE ONLY

VARIETIES

SYNGENTA HYBRID CABBAGES AVAILABLE IN ZIMBABWE

Fabiola F1

The Early Maturity Variety With Black Rot Resistance.

Intello F1

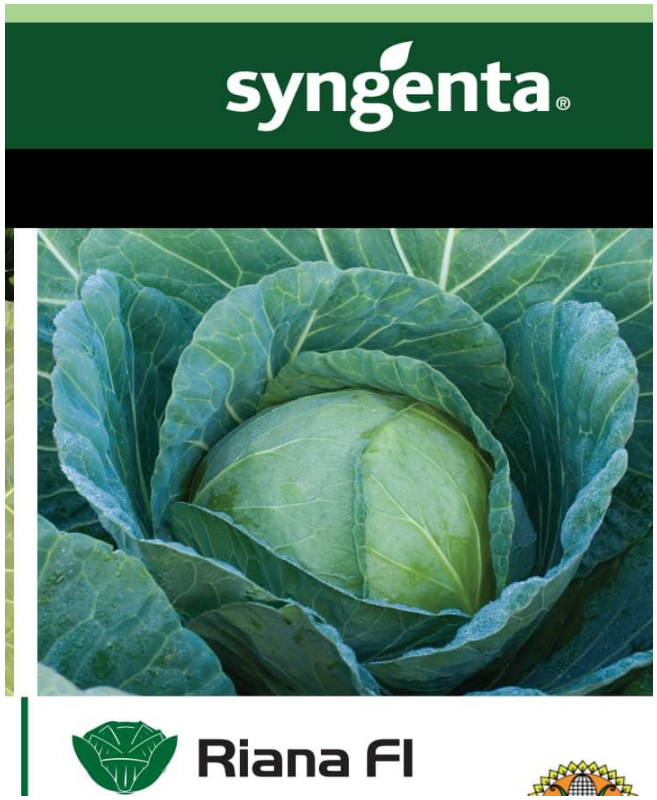
A Large and Uniform Head Cabbage Generation,
Heat Tolerant and With a High Disease Resistance Package.

Classification: INTERNAL USE ONLY

SYNGENTA CABBAGES IN THE FIELD

Classification: INTERNAL USE ONLY

SYNGENTA HYBRID CABBAGES AVAILABLE IN ZIMBABWE



Classification: INTERNAL USE ONLY

SYNGENTA SEED PACKS

Classification: INTERNAL USE ONLY

SOIL ISSUES; type; pH

- Any soil texture.
- Good drainage.
- Good depth - > 50cm.
- Good organic matter = manure/compost.
  - good aeration and water penetration.
- pH 6,5 – 7,0 = slightly sweet.

Classification: INTERNAL USE ONLY

SOIL ISSUES - preparation

- Spread lime, manure, disc = into top 20cm – set disc to cut 30-40cm.
- 500 – 2000 kg/ha lime.
- Make up beds 1,2 – 1,5 metres wide (2-3 rows per bed), middle row shaded
- or ridges 50cm wide @ 1 row per ridge.
- Paths 30 – 40 cm wide.
- On flat = mark paths after every 2-3 rows.
- Paths are necessary for constant traffic control = soil compaction – transplanting, weeding, fertilizing, irrigating, spraying, harvesting.
- 2 -3 driplines per bed.
- The soil should be prepared thoroughly and deeply before planting - ideally should first be ripped or chisel-ploughed; then ploughed and/or disced.
- The land should be level and uniformly sloping so that water does not accumulate in patches.

Classification: INTERNAL USE ONLY

PLANT POPULATION AND SPACING

- A general population of between 30 000 and 40 000 plants per hectare is recommended – even higher.
- Between rows can be 50-60cm.
- Plant-to-plant along rows 40-50cm.
- Plant spacings that are more square (i.e. 50 cm x 60 cm) will help in providing a more uniform crop.

Classification: INTERNAL USE ONLY

TRANSPLANTING SEEDLINGS

- The seedlings must be transplanted and watered ASAP after they have been obtained from the nursery.
- Seedlings should be placed vertically into the ground in the planting hole.
- This is to avoid a condition called “J rooting”. This condition results in a J-shaped root system that slows down growth, decreases yield and head size.

Classification: INTERNAL USE ONLY

TRANSPLANTING SEEDLINGS

- Once the seedling is placed in the hole the soil should be firmed so that sufficient contact is made between the seedling and the soil.
- When planting seedlings a choice can be made between the square method and the staggered method of spacing. The staggered method is more advantageous as there is less competition between plants compared to the square method where plants are directly opposite each other.

Classification: INTERNAL USE ONLY

TRANSPLANTING; SPACING BETWEEN ROWS/PLANTS

3 row beds

Classification: INTERNAL USE ONLY

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STAGGERED PLANT SPACING

Classification: INTERNAL USE ONLY

DURING OR AFTER TRANSPLANTING

- Drench any APHID insecticide into planting hole @ transplanting.
- Good watering 2 x week.
- Spray CUTWORM insecticide after transplanting.
- Spray selective herbicide – e.g. DUAL MAGNUM after the first irrigation.

Classification: INTERNAL USE ONLY

FERTILIZER USE; MANURE/COMPOST

- Soil sampling and analysis is the first step to proper use of fertilizers.
- Water used for irrigation should also be analysed.
- MANURE
  - CABBAGES do well when well decomposed manure/compost is applied at the correct quantity of around 3-5 kg/m^2.
  - Or, crop residues from rotation.

Classification: INTERNAL USE ONLY

FERTILIZATION GUIDELINES

- At planting: 600-750 kg/ha (1 x Fert Cup 22/hole) Compound C or 400-550 kg/ha (1 x Cup 16/hole) Veg Blend.
- Planting fertilizer must be well mixed with the soil.
- As topdressing AN at 100 kg/ha (3 grams/plant) each time at 2, 4, and 6 weeks after transplanting.
- Check regarding use of soluble foliar ferts from fertilizer companies.

Classification: INTERNAL USE ONLY

IRRIGATION

- Total water requirement is approximately 500 mm (50 litres/m²).
- As a general guideline:
- COOL May-Aug period:
  - Apply 15 mm (1,5 litres/m²) per week for the first half of the growing season, and about 25 mm (2,5 litres/m²) per week thereafter
- WARM Sept-April period:
  - Apply 25 mm (2,5 litres/m²) and 40 mm (4 litres/m²), respectively.

- Do not let the soil dry out.
- The most critical moisture period is:
  - Soon after transplanting
  - During rapid leaf development
  - During head development

Classification: INTERNAL USE ONLY

WEED MANAGEMENT IN VEGETABLES

- Good weed control in CABBAGES begins before the crop is planted.
- Know the weeds that are a problem in the field.
- Control established perennials before planning to plant.
- Choose herbicides that control the weeds in the field, apply the proper rate for the soil texture, watch & learn about crop damage.
- Use cultural, mechanical, and chemical weed control techniques in a coordinated manner.

DAYS TO MATURITY; HARVESTING - CABBAGE; MARKETING

- CABBAGE YIELDS: Conservative = 25’000 heads/ha; Likely = 30’000 Target = 40’000.

- When is CABBAGE ready to be picked or harvested?

- SYNGENTA’S Fabiola is ready 65 DATr; Intello in summer and 95 DATr Rihana

Classification: INTERNAL USE ONLY

CROP BUDGET TEMPLATE

ITEM	QUANTITY/HA	UNIT COST	COST/HA
Seed			
Fertilizer – planting			
Fertilizer – topdress			
Fertilizer - foliar			
Land Preparation & Lime			
Herbicide			
Nematicide			
Fungicides			
Insecticides			
Labour costs – planting; weeding			
Tractor costs			
Irrigation			
Harvesting			
Packing material			
Transport to market			
Management cost			
SUBTOTAL			
SALES INCOME			
GROSS MARGIN			

Classification: INTERNAL USE ONLY

CABBAGES PESTS

- Use Integrated Pest Management (IPM) approach.

- A system that combines managerial, cultural, physical, biological and chemical control methods to manage pests.

- The key to IPM is to understand what pests are in the crop

  - through scouting and taking action to discourage pests from becoming a problem.
  -

- IPM is a proactive approach to pest management, rather than just a reaction to pests as they occur.

Classification: INTERNAL USE ONLY

PESTS OF CABBAGES

PEST	Scientific name	Common name	Solution
APHIDS	*Brevicoryne brassicae* *Myzus persicae*	**Cabbage aphid** Green peach aphid	Actara drench or spray; Chess spray; Polo spray
LEPIDOPTERA	*Plutella xylostella* *Crocidolomia pavonana* *Hellula undalis* *Trichoplusia orichalcea* *Agrotis* spp.	**Diamond-back moth** Greater cabbage moth ,web worm,semi-looper **Cutworm**	Ampligo spray Karate Zeon spray
BUGS	*Bagrada hilaris*	**Bagrada bug.** Damage is severe during early attacks when they destroy the growing point of the plants.	Karate Zeon followed by Actara sprays

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CUTWORM

- Cutworms (*Agrotis ipsilon*) are greyish, fleshy caterpillars up to 5 cm long, which curl up when disturbed.
- Plants may be chewed off above or below ground level and may be damaged higher up by climbing cutworms.
- Most of the cutworm damage is to newly set plants in the field.

Use it as a drench for effective soil pest control, cutworm , grubs, wire worms , beetles , caterpillars and foliar spray for caterpillars and Bugs

Classification: INTERNAL USE ONLY

APHIDS

Actara® 25 WG

- The cabbage aphid, (*Brevicoryne brassicae*), can be a major pest.
- Aphids are small, soft-bodied, slow-moving insects.
- A colony consists of winged and wingless adults and various sizes of young ones.
- They are often found in large groups on the under surface of leaves; however, aphids will feed on heads, flower stalks as well as leaves, resulting in unmarketable produce.

Crop:
Vegetables, Onion , Brassicas (Cabbages , Brocolli , Cauliflower) , Tomatoes , Curcubits

Target Pests:
Thrips , Aphids, Whitefly and Jassids (Sucking Pests)

Actara (Thiamethoxam) 25% WG
Insecticide

DIAMOND BACK MOTH

- The most destructive insect pest of CABBAGE crops throughout the world.
- The adult is a small moth about 10 - 12 mm long
- Eggs are pale yellow and 0.5 mm long. There are 4 caterpillar growth stages.
- Caterpillars grow to 12mm.
- Caterpillars can mine into the leaves, scrape off one surface of the leaf and make holes on the leaves and tunnel into the crop heads.

Ampligo is a broad spectrum insecticide that can be used to control Tuta Absoluta, Diamond Back Moth, Whiteflies, Leaf-hoppers and Fall Army Worm.

A translaminar, encapsulated suspension flowable concentrate insecticide with contact and stomach action for the control of various pests on crops as listed.

Active Ingredient

100g/lt Chlorantraniliprole

50g/lt Lambda-Cyhalothrin

Formulation

Encapsulated Soluble Concentrate

DIAMOND BACK MOTH DAMAGE

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BAGRADA BUG

CABBAGE DISEASES

Disease	Scientific name	Comments	Solution
DAMPING OFF	*Rhizoctonia, Pythium*	Pre-emergence when seeds are attacked and decay; plants germinate, but fail to emerge. Post-emergence damping off occurs when the stems of 2 to 5 cm tall; plants are attacked; the seedling wilts and falls over.	Apron Star seed treatment; Folio Gold; Ridomil Gold drench

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Seed Treatment Solution

APRON STAR is a seed treatment fungicide-insecticide mixture for controlling downy mildew damping-off diseases as well as for protection of seeds and seedlings against early season insect pests and soil borne diseases in beans, sorghum,maize, cotton and vegetables.

"Outstanding control of early season insect pests and diseases, Increased crop vigour and Greater yields"

Triple Power with **APRON STAR**

The three-way powered seedling protection is based on modern chemistry.

Active Ingredient Content

200g/Kg Thiamethoxam
200/Kg Metalaxyl –M
20g/Kg Difenoconazo

BLACK ROT

BLACK ROT	***Xanthomonas campestris***	**Humid, rainy conditions favour the disease, which is usually spread by splashing rain or irrigation water.**	**Bion**

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USE AND EFFECTS OF BION 50 WG

- Bion - not a FUNGICIDE or BACTERICIDE
- Bion - a PLANT ACTIVATOR
  - Triggers plant's IMMUNE SYSTEM to fight presence of BACTERIA
  - Before disease sets in
- Must be applied to young plants (= vaccinating babies/children)
  - Cabbages – start at 3 weeks then 5 weeks after transplanting

ACTIVE INGREDIENT = acibenzolar-s-methyl 500 g/kg.

Bion® 50 WG gives the plant the "boost" to defend itself against diseases. **Bion®** does this by stimulating the plant's natural defence mechanisms. The graph below shows such activation/boosting in tomatoes.

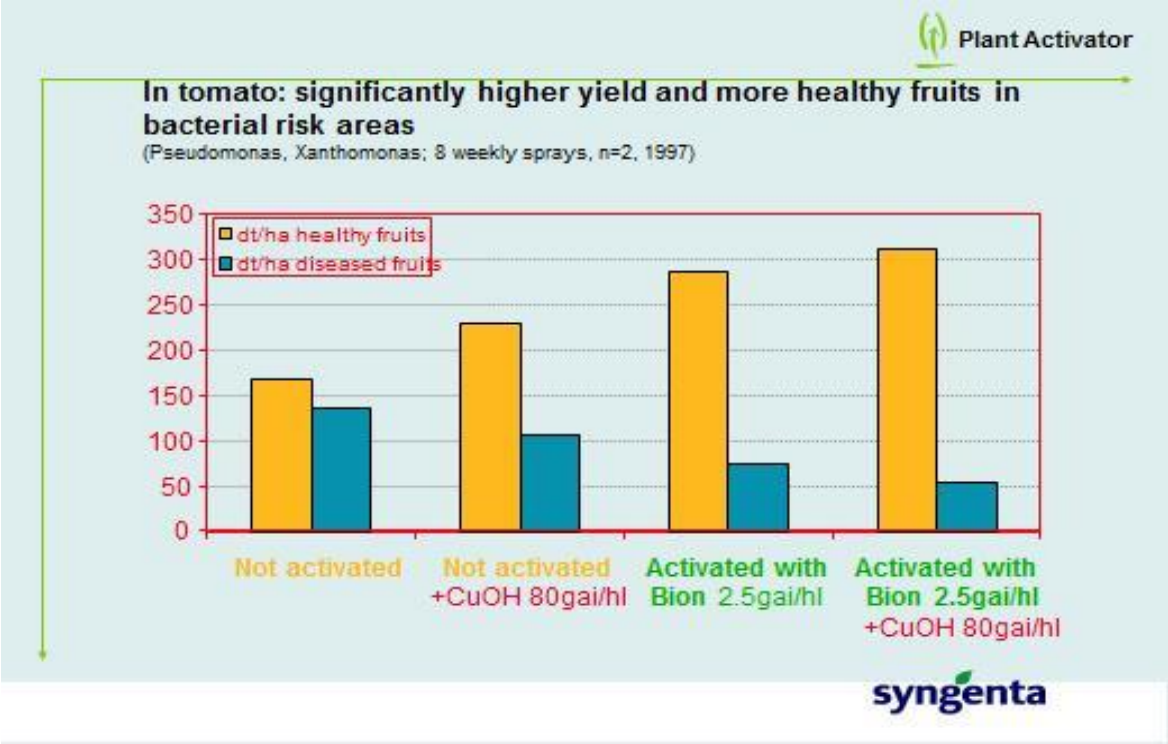
BION is a plant activator and not a fungicide.

MAIN ADVANTAGES OF USING Bion®

- Prepares the plant to fight disease early in infection.
- Good effect against bacteria.
- Excellent safety to most crops.
- Compatible with most fungicides and insecticides.
- Good UV stability.
- Green triangle product.

Plant Activation

Bion® 50 WG



DOWNY MILDEW

DOWNY MILDEW	***Peronospora parasitica***	**The top of the leaves turn purple, then later turn yellow or brown.**	**Folio Gold; Ridomil Gold; Revus**

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CLUB ROOT

CLUB ROOT	***Plasmodiophora brassicae***	**Soil-borne disease; symptoms include small to large swellings and other malformations of the roots; above-ground parts to wilt, change colour and look stunted; thrives best in acid soils; remains in soil for 7-20 years.**



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Fungal Disease Solutions

Azoxystrobin, Difenoconazole

FUNGICIDE GROUP 11 & 3

Broad spectrum suspension concentrate fungicide with systemic, translaminar and contact properties for the preventive control of different leaf diseases in crops as per label

Amistar Top Fungicide Offering preventive, systemic and curative activity, Amistar® Top contains two fungicides to provide broad-spectrum control of many important vegetable, rice, cotton, citrus, and tree nut diseases, including leaf spots, blights and powdery mildew.

PRODUCT BENEFITS
Revolutionary broad-spectrum resistance management tool
Demonstrates rapid uptake with translaminar and xylem-systemic movement
Contains a robust combination of azoxystrobin and difenoconazole
Offers preventive, systemic and curative activity

RIDOMIL GOLD® MZ 68 WG is a leading fungicide for control of important diseases caused by the Oomycete fungi

RIDOMIL GOLD controls soil and leaf diseases in a number of crops including vegetables, grapes, citrus, potatoes,ornamentals,tobacco and cotton. RIDOMIL GOLD is a highly effective fungicide for the control of Oomycete fungi (including late blight and Downy mildew).

Active ingredient

Metalaxyl-M 40g/Kg
Mancozeb 640g/Kg

Revus®

- Composition: 23.4%Mandipropamid
- Formulation: Suspension Concentrate (SC)
- Mode of action: Revus inhibits the biosynthesis of phospholipids and cell wall deposition, thus effectively inhibiting the germination and spread of fungus

- unique contact and translaminar fungicide used for management of Downy Mildew and Late blight especially on Fruits and Vegetables
- Due to its unique Lok & Flo feature, it provides complete protection and safety to the crop
- Provides effective protection to the new growth, tender leaves and buds
- Rapid flow of Revus to the leaf ensures a quicker protection shield as well as protection from rains

Revus delivers Peace of mind to the farmer, due to its:

- Highly effective activity on the target fungus
- Complete protection against the fungus
- Ability to stop the secondary spread of the fungus
- Quick rain fastness

CROP PROTECTION SOLUTIONS FOR BRASSICAS

- Weed Management
- Pests
- Diseases

Classification: INTERNAL USE ONLY

TOUCHDOWNFORTE IN VEGETABLES

- TouchdownForte can be used in any vegetable crop as a pre planting NON-SELECTIVE spray to endure a clean seedbed from the start
- Apply to the weeds at least 15 days before initial land prep or 4-5 days before planting.
- Pre Irrigating the weeds increases herbicide efficacy
- Ideal for problem weeds like pfende (*cyperus esculentus*) , nzai grass (*Leersia hexandra*) and Rusikira grass (*Panicum repens*)
- And annual like rapoko grass (*Eleusine indica*)and jekacheka (*Ricardia Scabra*)cyonodon ,
- .

Non-Selective Pre Planting Herbicide

TouchdownForte® Hi Tech

HERBICIDE GROUP G

A soluble concentrate non-selective foliar, systemic herbicide with a wetting agent for use in glyphosate tolerant crops and for the control of a wide range of annual and perennial grasses, broadleaf weeds, certain woody perennials and industrial weed control.

DUAL MAGNUM IN VEGETABLES

- Dual Magnum can be used in tomatoes and cabbages as a pre-transplant surface treatment, or post-transplant as a shielded directed spray.
- Dual Magnum is a pre-emergence herbicide used to control annual grasses, nightshade species, galinsoga, and pigweed species, and suppresses or controls yellow nutsedge.
- Irrigation is needed to “activate” the herbicide.

Dual Magnum®

Dual Magnum Herbicide
Recommended as a preemergence application, Dual Magnum® herbicide is used to manage annual grass and small-seeded broadleaf weeds.
It is registered for use on a variety of crops, such as corn, cotton and soybeans.

Active Ingredients:
S-metolachlor

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Dual Magnum

Post-Emergent Grass Herbicide

- Fusilade Forte is a superior post emergence .grass weed herbicide which is used in fruits and vegetables.
- Fusilade Forte is applied when weeds are between 2- 8 leaf stage. Fusilade Forte kills all germinated Grass weeds and is able to select a wide variety of vegetables and fruits.

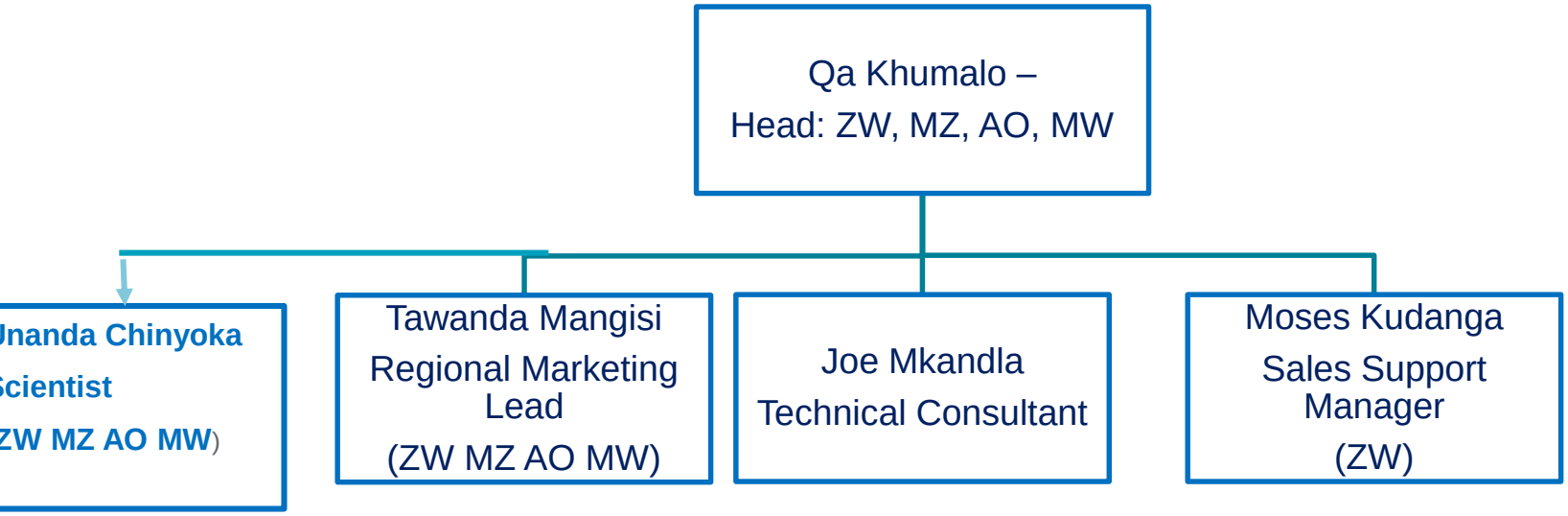
Microsoft
oint 97-2003 Prese

Fusilade Forte®

syngenta

Fusilade Forte®

Zimbabwe Country Office Team



Classification: INTERNAL USE ONLY

Questions

- 1. it’s important to have soil tested before applying lime. also the type of lime must be specified as they are different forms.
- 2.What exactly the type of diseases is Intello resistant to. you only mentioned it has disease resistant package
- 3.Can club root be detected from soil tests
- 4.May you also send the information on email about the three types of lime. That was useful.
- 5.phillipchengeta@gmail.com. thanks for the details. I'll try the red cabbage as I have the market for it. am looking for Newton tomatoes for my greenhouse
- 6. Is there a way to detect club root from the soil before planting cabbage in a new field \
- 7.Can i have the spraying program for Cabbage Fabiola in Winter

Classification: INTERNAL USE ONLY

Answers

- 1. Intello has High Resistance to FOC 1 (Fusarium oxysporum f. sp. conglutinans race 1 - Black Rot) Resistant to Blackrot,
- 2. Riva Red Cabbage will be available soon from Prime Agro (Syngenta Distributor), They will give you a call once it's in the country- you can kindly share your contact details.
- 3. Newton Tomato is available from Intaba Trading (Syngenta Distributor) Kindly call Raymond for price on 0772392433
- 4. it's important to have soil tested before applying lime. also the type of lime must be specified as they are different forms. This is true.
- 5.What exactly the type of diseases is Intello resistant to. you only mentioned it has disease resistant package
- 6.Can club root be detected from soil tests. Yes send samples to a Plant Pathology laboratory such as TRB Kutsaga Research Station.
- 7.May you also send the information on email about the three types of lime. That was useful. 1. Calcitic Lime (powder, high in calcium but takes 3 months to raise the soil pH). 2. Dolomitic Lime (powder, high in magnesium but takes 3 months to raise the soil pH). 3. Omya Calcipril (high in calcium, granulated and works within about 3-4 weeks to raise soil pH).
- 8. Is there a way to detect club root from the soil before planting cabbage in a new field – see No. 6 above.

Classification: INTERNAL USE ONLY

THE END