

BEFORE USING THIS PRODUCT READ THE LABEL CAREFULLY!

Fungicide



**ROOTMASTER 98**

Reg. No. L 5252 Act/Wet No. 36 of/van 1947

1: 26/4/2012 – June 2017

*A systemic fungicide for the control of Phytophthora root and Collar rot in citrus and Root rot in avocados.*

*'n Sistemiese swamdoder vir die beheer van Phytophthora wortel- en Kraagvrot in sitrus en Wortelvrot in avokado's.*

**ACTIVE INGREDIENT / AKTIEWE BESTANDDEEL**

phosphorous acid **980 g/kg** fosforigsuur

FRAC FUNGICIDE GROUP CODE **33** FRAC SWAMDODER GROEPKODE

kg

**villa**

Registration holder / Registrasiehouer:  
Universal Crop Protection (Pty) Ltd.  
Co. Reg. No. / Mpy. Reg. Nr. 1983/008184/07  
PO Box / Posbus 801, Kempton Park, 1620  
Tel: 011 396 2233  
Website / Webblad: [www.villacrop.co.za](http://www.villacrop.co.za)

**UN Number: 2834**

Willow Set & Print 011 394-4486



**CAUTION  
VERSIGTIG**



GEBRUIKSAANWYSYNGS INGESLUIT

VERWYS NA BESONDERHEDE  
GEDRUK OP HOUER/SAK

Date formulated:  
Formuleringsdatum:

DIRECTIONS FOR USE ENCLOSED  
REFER TO DETAILS PRINTED  
ON CONTAINER/BAG

Batch number:  
Lotnommer:

DIRECTIONS FOR USE ENCLOSED

**ROOTMASTER 98**

Reg. No. L5252 Act/Wet No. 36 of/van 1947

FRAC FUNGICIDE GROUP CODE / FRAC SWAMDODER GROEPPKODE: 33

**ACTIVE INGREDIENT / AKTIEWE BESTANDDEEL:***phosphorous acid / fosforigsuur*..... 980 g/kg

Registration holder / Registrasiehouer:

**UNIVERSAL CROP PROTECTION (PTY) LTD.**

Co. Reg. No. 1983/008184/07 Mpy. Reg. Nr.

P.O. Box / Posbus 801, KEMPTON PARK, 1620, Tel. (011) 396 2233

**CAUTION / VERSIGTIG****WARNINGS****Withholding periods:**

Minimum number of days between the last application and harvest:	
Avocados	100 days

**PHOSPHOROUS ACID FORMULATIONS ARE VIEWED AS FERTILIZERS, RATHER THAN FUNGICIDES IN MANY COUNTRIES OF THE WORLD AND THEREFORE NO MRL (MAXIMUM RESIDUE LEVEL) HAS BEEN DETERMINED OR ESTABLISHED. OTHER COUNTRIES MAY NOT USE PHOSPHOROUS ACID FORMULATIONS EITHER AS A FUNGICIDE OR FERTILIZER, AND THEREFORE EXPORTING ROOTMASTER 98 TREATED FRUIT TO COUNTRIES WITHOUT ESTABLISHED MRL VALUES, MAY PRESENT PROBLEMS. PRODUCERS WHO WANT TO EXPORT FRUIT ARE THUS RECOMMENDED TO DISCUSS THIS MATTER WITH THEIR EXPORT AGENTS BEFORE USING ROOTMASTER 98.**

- Handle with care – corrosive.
- Product reacts with metals and generates hydrogen that may cause potential flammable and explosive mixtures.
- **ROOTMASTER 98** is very hygroscopic.
- Although prepared solutions of **ROOTMASTER 98** are neutralized they may still be corrosive to metal. Use plastic or fiberglass containers for handling **ROOTMASTER 98** solutions.
- Harmful if swallowed.
- Cause irritation of eyes, air passages and skin.
- Store in a cool, well-ventilated and dry area. Keep away from metals and naked flames.
- Store away from food, feeds, seeds, fertilizers and other agricultural chemicals.
- Keep out of reach of children, uninformed persons and animals.
- Re-entry: Do not enter treated area until spray deposit has dried unless wearing protective clothing.

**Although this remedy has been extensively tested under a large variety of conditions, the registration holder does not warrant that it will be efficacious under all conditions, because the action and effect thereof may be affected by factors such as abnormal soil, climatic and storage conditions, quality of dilution water, compatibility with other substances not indicated on the label and the occurrence of resistance of the disease to the remedy concerned, as well as by the method, time and accuracy of application. The registration holder further does not accept responsibility for damage to crops, vegetation, the environment or harm to man or animal or for lack of performance of the remedy concerned, due to failure of the user to follow the label instructions or to the occurrence of conditions, which could not have been foreseen in terms of the registration. Consult the supplier in event of any uncertainty.**

**PRECAUTIONS**

- Avoid contact with eyes and skin.
- Wear rubber gloves, rubber boots and a face shield when handling, mixing and applying the product.
- Wash with soap and water after use or accidental skin contact. Do not rub the skin. If irritation persists, seek medical attention.
- In case of eye contact, flush eyes thoroughly with copious amounts of clean cold water for at least 15 to 20 minutes, while keeping the eyelid(s) open. If irritation persists, seek medical attention.
- If the product has been ingested, do not induce vomiting. Let the person rinse his/her mouth thoroughly and drink plenty water or milk. Get medical attention immediately.
- Wash contaminated clothes daily after use.

- Do not eat, drink or smoke whilst applying, mixing or before washing hands and face or change of clothing.
- Do not mix in metal containers. Use robust and heat tolerant fiberglass or plastic containers when mixing with potassium carbonate and/or potassium hydroxide when much heat and foam are generated. Containers should provide spare capacity to contain the foam generated by the reaction.
- Only prepare sufficient solution that will use for that particular treatment(s). Avoid preparing excess volumes of solution that will not be applied within 24 hours.
- Emptied containers retain vapour and product residues. Observe all labeled safeguards until container is destroyed.
- Clean applicator after use and dispose of wash water where it will not contaminate food, grazing, rivers or dams.
- Containers and packages must be completely emptied before being disposed of. Shake out thoroughly into the mixing tank. Do not re-use the empty container for any other purpose but destroy it by perforation and flattening and bury in an approved dumpsite.
- **Do not burn the empty container.**
- Prevent contamination of food, feeds, drinking water and eating utensils.
- Comply with local legislation applying to waste disposal.

### **USE RESTRICTIONS**

- **ROOTMASTER 98** can only be applied to actively growing trees.
- Trees should not be treated when suffering from heat, drought or heavy fruitset or other stress condition as such conditions (even when temporary) may lead to a phytotoxic response (e.g. leaf scorch and gummosis).
- To ensure effective translocation of this systemic product, only use **ROOTMASTER 98** on actively growing trees when sufficient sap flow is taking place.
- Although **ROOTMASTER 98** has been neutralized, it may still be corrosive to metal surfaces. It is recommended to use plastic or fiberglass containers when using the product as a trunk paint treatment.

### **RESISTANCE WARNING**

**ROOTMASTER 98** is a group code 33 fungicide. Any fungus population may contain individuals naturally resistant to **ROOTMASTER 98** and other group code 33 fungicides. The resistant individuals can eventually dominate the fungus population if these fungicides are used repeatedly. These resistant fungi may not be controlled by **ROOTMASTER 98** or any other group code 33 fungicide.

To delay fungicide resistance:

- avoid exclusive repeated use of fungicides from the same fungicide group code. Alternate or tank mix with products from different fungicide group codes,
- for tank mixing or alternation with products in fungicide group code M, refer to applicable individual product labels,
- integrate other control methods (chemical, cultural, biological) into disease control programmes.

For specific information on resistance management contact the registration holder of this product.

### **DIRECTIONS FOR USE: Only use as directed.**

#### **Compatibility:**

- **ROOTMASTER 98** must not be mixed with other chemicals except where indicated.

### **MIXING INSTRUCTIONS FOR 125 LITRES OF A “PAINT-ON” SOLUTION FOR USE IN CITRUS**

- Use a heat tolerant plastic or fiberglass container with excess capacity as a reaction vessel. Calibrate and mark at volume of 125 litres.

### **TWO BASE SOLUTIONS NEED TO BE PREPARED:**

#### **NOTE**

**READ THE INSTRUCTIONS BELOW CAREFULLY BEFORE SOLUTIONS ARE PREPARED, SO THAT THE PROCESS IS UNDERSTOOD AND ALL PREPARATIONS AND EQUIPMENT WILL BE READY.**

#### **Solution 1**

- To the reaction vessel, add 25 kg of either potassium carbonate **OR** potassium hydroxide **slowly** to 50 litres of cold water.

- The dissolution of these substances in hot water is an exothermic reaction, which generates significant amounts of heat. If potassium hydroxide is added to the water too quickly the temperature can exceed 100 °C. Allow the solution to cool off (for at least 60 minutes) to ambient temperature before proceeding.

#### Solution 2

- Using a second container, add 25 kg **ROOTMASTER 98** slowly, while stirring, to 50 litres of cold water.
- The dissolution of **ROOTMASTER 98** in water is an endothermic reaction that absorbs much heat from the water. The temperature of the solution will therefore drop sharply and may approach 0°C.

#### Final Solution

- Combine solution 1 and 2 by adding Solution 2 (i.e. the **ROOTMASTER 98** solution) to Solution 1 (i.e. the potassium solution) in the reaction vessel. This is best done soon after the preparation of the **ROOTMASTER 98** solution i.e. while the solution is still cold. As the solutions are combined, the temperature of the liquid in the reaction vessel will increase strongly and it is very likely that boiling point could be reached. Avoid boiling by maintaining the temperature below 90 °C. At times it may be necessary to cool the liquid by spraying the outside of the reaction vessel with water.
- Combining the **ROOTMASTER 98** solution with the potassium hydroxide solution is a very vigorous reaction and needs to be done very slowly and especially so in the early stages of the reaction.
- Neutralizing **ROOTMASTER 98** with potassium carbonate is less vigorous but also requires great care. Much foam is generated when **ROOTMASTER 98** is neutralized with potassium carbonate. The excess capacity of the reaction vessel is required to contain this foam as well as to provide personal protection against the extreme vigour of the reaction when potassium hydroxide is used to neutralize **ROOTMASTER 98**. Full protective clothing is recommended when preparing these paint-on solutions.

#### Final Volume

- Allow the solution to stand to cool down. The final volume of the solution produced is expected to be about 15 % greater than the volume of the water used. The solution should now be topped up with water to the 125 litres mark. After stirring to ensure the mixing in of the top-up water, the paint-on solution is ready for use.

### **MIXING INSTRUCTIONS FOR 125 LITRES OF “INJECTION-SOLUTION” AT A PH 7.2 FOR USE IN AVOCADOS**

#### **NOTE**

**READ THE INSTRUCTIONS BELOW CAREFULLY BEFORE SOLUTIONS ARE PREPARED SO THAT THE PROCESS IS UNDERSTOOD AND ALL PREPARATIONS AND EQUIPMENT WILL BE READY.**

- Use a heat tolerant plastic or fiberglass container with excess capacity as a reaction vessel. Calibrate and mark at volume of 125 litres.

#### **FOUR BASE SOLUTIONS NEED TO BE PREPARED:**

##### Solution 1

- Add 15 kg of potassium hydroxide to 35 litres of cold water in a heat tolerant, fiberglass or plastic container.

##### Solution 2

- Add 21 kg potassium carbonate to 35 litres of cold water in a heat tolerant, large fiberglass or plastic reaction vessel with spare capacity.
- The dissolution of these substances, and particularly the potassium hydroxide, in water are exothermic reactions, which generates significant amounts of heat. (If potassium hydroxide is added to the water too quickly the temperature can exceed 100 °C.) Allow the solution to cool off (for at least 60 minutes) to ambient temperature before proceeding.

##### Solution 3

- Add 25 kg **ROOTMASTER 98** to 35 litres of cold water in fiberglass or plastic container.
- The dissolution of **ROOTMASTER 98** is an endothermic reaction, which absorbs much heat from the water. The temperature of the solution will therefore drop sharply and may approach 0 °C.

Solution 4

- Combine solutions 3 and 2 by slowly adding solution 3 (i.e. the **ROOTMASTER 98** solution) to solution 2 (i.e. the potassium carbonate solution) in the reaction vessel.
- This is best done soon after the preparation of the **ROOTMASTER 98** solution i.e. while it is still cold. The combination of these solutions produces a large amount of foam which needs to be contained. Hence the need for spare capacity in the vessel containing solution 2. Moderate heat will be generated by the reaction.
- Allow the liquid to cool before proceeding.

Final Solution

- Add solution 1 slowly to solution 4 in the reaction vessel.
- At this stage the **ROOTMASTER 98** solution is partially neutralized and the reaction is therefore less vigorous but care is required to ensure that the addition of solution 1 to solution 4 is not rapid.
- The temperature of the solution should nevertheless be monitored so as not to exceed a value of 90 °C. When the additions are complete allow the solution to cool and check pH.

Final Volume

- The sum of all the additions, made in the production of the injectable solution, result in a final volume, which is approximately 15 % greater than the volume of water used.
- This expansion must be allowed for in the selection of suitable reaction vessels.

Checking pH

- The above recipe is based on the use of distilled water and is expected to be generally applicable where soft waters are available. The final pH can be adjusted, if necessary, downward by adding small amounts of **ROOTMASTER 98** solution, and upwards by adding small amounts of a potassium hydroxide solution. **Do not** place the pH meter electrode into the final **ROOTMASTER 98** solution as the electrode of the pH meter could be damaged. It is recommended that a sample of the cooled **ROOTMASTER 98** solution be taken and diluted in the ratio of 1:9 with distilled (or battery) water. Do not use tap water for this dilution. Be sure that the pH meter used is functioning properly and be sure to check its accuracy in special test solutions of “known” pH values.
- Difficulties may be experienced in achieving the correct pH where hard waters are used. Large volumes of **ROOTMASTER 98** or potassium hydroxide solutions should however not be added to the final solution as this will result in strong deviations from the target concentration of the active ingredient. Both under, as well as over, application of the active ingredient could have expensive consequences.

Top-up

- The final step is to top the final solution up to the 125 litres mark. The material is now ready for use.

**RECOMMENDATIONS FOR CONTROL OF *PHYTOPHTHORA* ROOT- AND COLLAR ROT IN CITRUS**

- Apply the solution by painting the whole trunk from ground level upward for about 35 cm.
- Where graft incompatibility occurs, apply by painting the scion and lower scaffold branches only.
- Applications should commence soon after the start of the rainy season and should be repeated at 8-week intervals during the rainy season.
- To facilitate systematic translocation to roots of citrus trees, avoid applications when trees are flushing strongly. Under such conditions it will be preferable to delay the application until the new flush begins to harden off.
- The paint-on solution is suitable for use on non-bearing trees with green stems. Certain scion/rootstock combinations may however be sensitive. Confirmation of tolerance of the specific combination is recommended, and especially so where unusual scion/rootstock combinations are used.

**RECOMMENDATIONS FOR CONTROL OF *PHYTOPHTHORA* ROOT ROT IN AVOCADOS**Method of application

- The neutralized **ROOTMASTER 98** solution should be injected, using a syringe, into freshly drilled holes in the tree trunk. The number of injections depends on the tree size and the condition of the tree. A guide to the number and volume of injections is given below.
- If standard “avocado” syringes are used, holes should be drilled using a 4.8 mm bit. These holes should be spaced evenly around the trunk, should be angled downward and should be drilled to a depth of 30 to 50 mm.

- The required volume of solution should be drawn into the syringe. The syringe should then be inverted and the plunger pulled back to fill the remaining capacity of the syringe with air.
- Insert the tip of the filled syringe into one of the holes in the tree trunk ensuring a tight fit that will not leak when pressure is applied. Depress the plunger to compress the air in the syringe and then fix the plunger in this position. The compressed air in the syringe will help to force the **ROOTMASTER 98** solution into the tree. Repeat this process with all the holes that have been drilled. When the tree has taken up all the **ROOTMASTER 98** solution, remove the syringe.

#### Timing of application

- Inject **ROOTMASTER 98** solution after the leaves of the spring flush have hardened off and repeat when the leaves of the summer flush have hardened off. The calendar date for the correct timing of applications will vary according to the cultivar, weather conditions, and the region. Trees affected by *Phytophthora* root rot will flush later and such trees will therefore need to be treated at a second pass through the orchard. Injecting neutralized **ROOTMASTER 98** solutions too early, i.e. while trees are still flushing, will reduce translocation to the roots and will very likely increase residues in the fruit.

#### **APPLICATION RATES**

<i>Tree Diameter (i.e. Drip diameter)</i>	<i>mℓ of ROOTMASTER 98 solution per tree *</i>	<i>No of injections per tree</i>
<b><u>For trees up to 5 m in diameter</u></b>		
Inject as follows using a 10 % solution prepared by diluting the <b>ROOTMASTER 98</b> solution further with an equal volume of water.		
2 m	20 mℓ	1
3 m	40 mℓ	2
4 m	60 mℓ	3
5 m	80 mℓ	4
<b><u>For trees larger than 5 m in diameter</u></b>		
Inject as follows using the <b>ROOTMASTER 98</b> solution prepared according to the recipe given.		
6 m	60 mℓ	3
7 m	80 mℓ	4
8 m	100 mℓ	5
9 m	140 mℓ	7
10 m	160 mℓ	8
11 m	200 mℓ	10
12 m	220 mℓ	11
13 m	260 mℓ	13
14 m	300 mℓ	15
* - Do not apply more than 20 mℓ of the neutralized <b>ROOTMASTER 98</b> solution per injection.		