

# RUGBY® 20 CS

SOUTH AFRICA Registration Number/Registrasie Nommer L11714, Act No. 36 of 1947/Wet 36 van 1947

READ THE LABEL BEFORE USE  
KEEP OUT OF REACH OF CHILDREN AND ANIMALS

GROUP/GROEP	N-1B	INSECTICIDES	INSEKDODERS
A capsule suspension contact nematicide for the control of nematodes in the crops listed.		'n Kapsule suspensie kontak aalwurmdoder vir die beheer van aalwurms in die genoemde gewasse.	



#### HAZARD STATEMENTS:

Harmful if swallowed or if inhaled.  
Causes skin irritation.  
Causes serious eye irritation.  
May cause damage to organs (Peripheral nervous system, Central nervous system).  
May cause damage to organs (Blood, Central nervous system) through prolonged or repeated exposure.  
Very toxic to aquatic life with long lasting effects.

#### PRECAUTIONARY STATEMENTS:

##### Prevention:

Do not breathe mist or vapors.  
Wash skin thoroughly after handling.  
Avoid release to the environment.  
Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

##### Response:

**IF INHALED:** Remove person to fresh air and keep comfortable for breathing. Call a **POISON CENTER/** doctor if you feel unwell.  
Collect spillage.

## WARNING

#### Active ingredient

Cadusafos (organophosphate) – 200 g/L

#### Aktiewe bestanddeel

Kadusafos (organofosfaat) – 200 g/L

Net Volume

20L

Netto Volume

#### REGISTRATION HOLDER/REGISTRASIEHOUER

FMC Chemicals (Pty) Ltd  
Company Registration Number: 1988/001451/07  
West End Office Park  
Building C, Cnr West Ave & Hall Street  
Centurion, 0014  
[www.ag.fmc.com/za/en](http://www.ag.fmc.com/za/en)

Batch Number

Date of Manufacture

Expiry Date

Printed on Container

Printed on Container

2 Years from manufacture

Lot Nommer

Datum van Vervaardiging

Vervaldatum

UN Number/VN Nommer

3082

**For any emergency or poisoning contact:  
Griffon Poison Information Centre (24 hrs)  
Vir enige noodgeval of vergiftiging kontak Griffon vergiftiging  
Inligtingsentrum (24 hr)**

**+27-(0)-82-446-8946**

**Western Cape Poisons Information Helpline**

**+27 0861 555 777**

## **WARNINGS:**

### **HAZARD STATEMENTS:**

- Harmful if swallowed or if inhaled.
- Causes skin irritation.
- Causes serious eye irritation.
- May cause damage to organs (Peripheral nervous system, Central nervous system).
- May cause damage to organs (Blood, Central nervous system) through prolonged or repeated exposure.
- Very toxic to aquatic life with long lasting effects.

Citrus:	Do not harvest within 14 days of treatment
Peaches (Dose rate: 7.5 ml/m <sup>2</sup> ):	Do not harvest within 28 days of treatment
Peaches (Dose rate: 12.5 ml/m <sup>2</sup> ):	Do not harvest within 56 days of treatment
Potatoes:	Do not apply within 56 days of harvesting potatoes
Tobacco:	Do not harvest within 80 days of treatment

- Handle with care.
- Poisonous when absorbed through the skin or swallowed OR INHALED. May irritate eyes.
- Highly toxic to fish, other aquatic organisms, bees and wildlife. Ensure immediate mechanical incorporation or washing in by rain or irrigation water to minimize risk to birds and other animals.
- Store under lock and key in original container in a cool ventilated place away from food and feed
- Keep out of the reach of children, uninformed persons and animals.
- Inform staff (labourers, wives and children) of the potential danger of **RUGBY® 20 CS** nematicide when applied through the micro irrigation system and give full instructions on what to do in case of poisoning. It is advisable to mark treated areas with appropriate danger signs.
- **Pome fruit:** Care should be taken to prevent contact between this product and fruit or foliage during application. This could lead to severe brown scorching and chlorosis.
- **Re-entry interval:** Do not enter treated area within 1 day after treatment unless wearing protective clothing. For the first 30 days after treatment it is advisable that rubber gloves and rubber boots be worn when handling the soil and when irrigating.
- In case of poisoning call a physician and show them this label.

## **DISCLAIMER:**

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 therefore may be affected by factors such as abnormal soil, climatic and storage conditions: compatibility with other substances not indicated on the label and the occurrence of resistance of the pest against the remedy concerned as well as by the method, time and accuracy of application. The registration holder furthermore 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 the event of any uncertainty.

## PRECAUTIONS:

### **PRECAUTIONARY STATEMENTS:**

#### **Prevention:**

- Do not breathe mist or vapors.
- Wash skin thoroughly after handling.
- Avoid release to the environment.
- Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

#### **Response:**

- **IF INHALED:** Remove person to fresh air and keep comfortable for breathing. Call a **POISON CENTER/** doctor if you feel unwell.
- Collect spillage.

## HAZARDOUS INGREDIENTS

S,S-di-sec-butyl O-ethyl phosphorodithioate

hexamethylenediamine

Naphthenic acids, copper salts

- Avoid contact with skin and eyes, as well as **INHALATION OF THE SPRAYMIST**.
- Wear suitable protective clothing – overall, face shield, rubber gloves and boots. Wash contaminated clothing after use
- Wash with soap and cold water after use.
- Do not eat, drink or smoke during application or before washing hands and face.
- Keep unprotected persons away from operating areas and treated areas.
- Clean applicator/mixing tank after use or before using with other remedies. Dispose of wash water where it will not contaminate crops, grazing, rivers and dams.
- **TRIPLE RINSE** the empty container as follows: Invert the empty container over the spray or mixing tank and drain for at least 30 seconds after the flow has slowed down to dripping. Thereafter rinse the empty container three times in succession with one quarter of the container volume fresh water and decant the rinsate into the spray or mixing tank. Puncture the triple rinsed container and dispose of via an approved collector or recycler ([www.croplife.co.za](http://www.croplife.co.za)). Do not bury, burn or donate the container to any other parties that may use it as a container for food or beverages.
- Prevent contamination of food, feed, drinking water or eating utensils.
- Prevent contamination of springs, dams and rivers.
- **DO NOT APPLY THROUGH OVERHEAD / SPRINKLER/ CENTRE PIVOT IRRIGATION SYSTEMS.** Refer to **DIRECTIONS FOR USE** and specific crop recommendations.

## SYMPTOMS OF POISONING

Symptoms of overexposure includes the following: Headaches, light-headedness, weakness, abdominal cramps, nausea, excessive salivation, perspiration, blurred vision, tearing, pin-point pupils, blue skin colour, convulsions, tremor and coma.

## FIRST AID TREATMENTS

Eyes: Immediately irrigate with water for at least 15 minutes. If irritation occurs and persists, obtain medical attention.

**Skin:** Immediately flush with plenty of water while removing contaminated clothing and/or shoes and thoroughly wash with water. See a medical doctor immediately.

**Inhalation:** Call a medical doctor immediately. Remove to fresh air. If breathing difficulty or discomfort occurs and persists, see a medical doctor. If breathing has stopped give artificial respiration and see a medical doctor immediately.

**Ingestion:** Call a medical doctor immediately. Have person drink 1 to 2 glasses of water if possible. Do not induce vomiting unless advised by a doctor or poison control centre. Never induce vomiting or give anything by mouth to an unconscious person.

#### **NOTE TO PHYSICIAN:**

**RUGBY® 20 CS** nematicide is expected to be highly toxic if swallowed or inhaled and is moderately toxic if absorbed through the skin. It is non-irritating to mildly irritating to the eyes and to the skin. **RUGBY® 20 CS nematicide** contains a potent cholinesterase inhibitor. Atropine sulphate is antidotal. Support respiration as needed with removal of secretions, maintenance of a patient's airway and if necessary, artificial ventilation. If cyanosis is absent: Adults – start treatment by giving 2mg atropine intravenously or intramuscularly, if necessary and repeat with 0.4 – 2.0mg atropine at 15 minute intervals until atropinization occurs (tachycardia, flushed skin, dry mouth, mydriasis): *Children under 12* – initial dose = 0.05 mg/kg body weight and repeat dose = 0.02 – 0.05 mg/kg body weight. Start 2-PAM at the same time, following manufacturers recommended dosages and administration. Morphine reserpine, phenothiazines and theophylline are probably contraindicated. At the first sign of pulmonary oedema, the patient should be given supplemental oxygen and treated symptomatically. Observe patient to ensure that these symptoms do not recur as atropinization wears off. If in eyes instil one drop of homatropine. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care. Some individuals have a genetically determined low level of plasma pseudocholinesterase. These persons are particularly vulnerable to the action of the muscle paralyzing drug succinylcholine, often administered to surgical patients. They may be unusually sensitive to organophosphate toxicity - this has not been proven. Patient with advanced liver disease, malnutrition, chronic alcoholism and dermatomyositis exhibit low plasma cholinesterase activities. Some cholinesterase depression may occur during early stages of pregnancy or with use of birth control pills.

#### **RESISTANCE MANAGEMENT:**

Although resistance in nematode populations in the field has not been proven, repeated exclusive use of any product may lead to a reduction in control due to enhanced microbial biodegradation or other causes. Rotation with nematicides with a different mode of action is suggested. IPM programs using cultural practices, sanitation, planting of nematode resistant varieties, scouting or other detection methods, proper pest identification and rotation of nematicides with different modes of action will help prevent economic nematode damage.

For resistance management **RUGBY® 20 CS** nematicide is a group code N-1B pesticide. Any pest population may contain individuals naturally resistant to **RUGBY® 20 CS** nematicide and other group code N-1B pesticides. The resistant individuals can eventually dominate the pest population if these pesticides are used repeatedly. These resistant pests may not be controlled by **RUGBY® 20 CS** nematicide or any other group code N-1B pesticides.

To delay pesticide resistance:

- Avoid exclusive repeated use of pesticides from the same pesticide group code. Alternate or tank mix with products from different pesticide group codes.
- Integrate the control methods (chemical, cultural, biological) into pest control programmes.

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

## **DIRECTIONS FOR USE: USE ONLY AS DIRECTED**

### **MODE OF ACTION:**

**N.B. RUGBY® 20 CS NEMATICIDE WORKS BY CONTACT ACTION ONLY AND WILL ONLY CONTROL THE MOBILE STAGES OF THE NEMATODES WHILE THEY ARE ACTIVE IN THE SOIL. EGGS IN THE SOIL AND LARVAE THAT HAVE ALREADY PENETRATED THE ROOTS ARE NOT CONTROLLED. RUGBY® 20 CS NEMATICIDE WHEN CORRECTLY APPLIED AND INCORPORATED WILL ESTABLISH A BARRIER LAYER IN THE SOIL AND WILL ONLY PROVIDE PROTECTION FOR THE TUBERS AND ROOTS WITHIN THAT ZONE. THUS CORRECT PLACEMENT AND EVEN DISTRIBUTION OF THE PRODUCT IN THE TARGET ZONE IS ESSENTIAL. FURTHERMORE, MOISTURE IS ESSENTIAL TO ACTIVATE THE PRODUCT. SUFFICIENT SOIL MOISTURE MUST BE PRESENT AT APPLICATION FOLLOWED BY IRRIGATION / RAINFALL THEREAFTER (± 20 – 35 mm). MOISTURE STRESS CAN NEGATIVELY AFFECT EFFICACY AND ROOT DEVELOPMENT.**

### **ACCELERATED MICROBIAL DEGRADATION:**

This phenomenon can affect all soil-applied compounds. To minimize the possibility of accelerated microbial degradation from occurring, avoid long-term repeated applications of the same product / group of compounds.

### **PERENNIAL CROPS:**

1. The objective is to protect the formation of new roots. Application programmes should therefore commence when this can best be achieved.
2. Apply **RUGBY® 20 CS** nematicide to a weed and trash free surface. Immediately wash into the top layer of pre-moistened soil preferably by sprinkler/micro-jet irrigation for optimum results.
3. **Bananas:** Application should be made at the onset of the rainy season and followed-up in January – February.
4. **Citrus:** Application should take place at two monthly intervals starting at the onset of the rainy season.
5. **Guavas & Litchis** Application should be made at the onset of the rainy season and preferably after the first rains have fallen. Repeat annually
6. **Stone fruit and pome fruit:** The objective is to enhance and protect the formation of new roots. Application programmes should therefore commence when this can best be achieved. Spring (especially young non-bearing trees) and post-harvest (bearing trees) are two critical periods of root growth that need to be protected preventively.
7. **Grapevines:** Application should start in spring when the first growth of new roots occurs.

### **ANNUAL CROPS:**

1. **Chicory:** **RUGBY® 20 CS** nematicide may only be used on chicory produced under the control of Chicory SA Ltd. and only when recommended by duly authorized officials of Chicory SA Ltd.
2. **Pineapples:** Apply as an overall broadcast spray before planting and ensure thorough incorporation is followed up with irrigation.
3. **Potatoes:** Always plant certified nematode-free seed. Use only accurate and properly calibrated application equipment.  
**Table potatoes:** Apply as an overall broadcast soil treatment before planting (up to approximately 7 to 14 days) and ensure thorough incorporation by mechanical means with an off-set tandem disc or rotorvator operating at a maximum speed of 8kph to a depth of at least 15cm – the ideal depth is between 15 to 25cm. There should always be a treated layer of soil below the planting depth to ensure protection of the roots and tubers.  
Application and incorporation should be followed the same day by irrigation with a minimum 20mm. Special care must be taken in sandy soils to avoid over-irrigation and possible wash-off.  
**Irrigation alone is insufficient for the incorporation of RUGBY® 20 CS nematicide to the recommended depth.**  
To enhance nematode control and where potatoes are expected to remain in the soil for longer than 100 days, **RUGBY® 20 CS** nematicide must be used in a programme. It is recommended that an application of

**RUGBY® 20 CS** nematicide at planting should be followed by a full Vydate® SL insecticide/nematicide foliar application programme according to the Vydate® SL insecticide/nematicide label (follow all Directions for use). See Remarks below under Directions for Use on potatoes.

**Seed potatoes:** Apply at planting and ensure even coverage and thorough mixing with the soil around the seed tuber. Follow all recommendations listed above.

4. **Tobacco:** Apply as an overall broadcast application up to 10 days before planting and incorporate to a depth of at least 15cm before ridges are made and follow up with irrigation (minimum 20mm)

**COMPATABILITY:**

**RUGBY® 20 CS** nematicide should not be mixed with any other chemical or fertilizer.

**SOIL TYPE:** Avoid the use of **RUGBY® 20 CS** nematicide in soils with less than 10% clay

**SOIL pH:** **RUGBY® 20 CS** nematicide can be used in soils with a pH level between 5 and 9. Do not use in soils with a pH>9.

**MICRO-JET AND DRIP IRRIGATION SYSTEM: (citrus (micro-jet only), stone fruit, pome fruit, grapevines)**

1. The system must contain a functional check valve, vacuum relief valve and low-pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
2. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
3. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
5. The irrigation line or water pump must include a functional pressure switch, which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. Systems must use a metering pump, such as a positive displacement injection pump (e.g. Diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

**RECOMMENDATIONS:**

CROP/PEST	DOSAGE RATE	REMARKS
<b>BANANAS</b> Nematodes	7.5 mL/m <sup>2</sup> (twice annually)	Apply at the onset of the rainy season and follow up in January-February. Apply to weed and trash free surface of 1 m <sup>2</sup> mat around selected pseudostem. If sufficient rain does not fall immediately after application, wash the product into the top layer of soil by sprinkler or micro-irrigation. (20-25mm water). <b>SEE NOTES AND MODE OF ACTION</b>
<b>CITRUS</b> Nematode ( <i>Tylenchulus semipenetrans</i> )	3 applications of 7.5 mL / m <sup>2</sup> OR 2 applications of 10 mL / m <sup>2</sup>	Apply at two monthly intervals starting application at the onset of the rainy season. Apply to moist soil.  <u>Area to be treated (the number of m<sup>2</sup> treated depends on the size of the basin area/canopy):</u> Treat the tree basin, under the tree canopy for an overall surface spray <b>or</b> the area covered by the micro-irrigation system when applied by this method.  The product must be washed into top layer of soil by irrigation or rainfall immediately after application (20 – 35 mm)  <b>REFER TO NOTES HEREUNDER AND DIRECTIONS FOR USE: MICRO-JET AND DRIP IRRIGATION SYSTEM.</b>

**NOTES: CITRUS & BANANAS**

- Ensure that the correct amount of **RUGBY® 20 CS** nematicide is evenly distributed over the treated area by using sufficient water to obtain good coverage.
- Take note that when **RUGBY® 20 CS** nematicide is applied through the micro-jet irrigation system, it will only control nematodes present in the area reached by the micro-jet.
- **RUGBY® 20 CS** nematicide may be used as a follow-up application after an initial spring application of a systemic nematicide.

CROP/PEST	DOSAGE RATE	REMARKS
<b>CHICORY</b> (produced under control of Chicory SA Ltd)	15 ℓ per ha	Apply before ridging and planting as an overall application to a fine moist seedbed free from clods, pieces of organic material and weeds. Apply evenly over the soil surface, properly incorporated and thoroughly mixed with the soil using a tandem disc. <b>USE ONLY ON RECOMMENDATION OF AUTHORISED OFFICIALS OF CHICORY SA LTD.</b> <b>SEE NOTES AND MODE OF ACTION</b>

**NOTES: CHICORY:**

- Ensure that the correct amount of **RUGBY® 20 CS** nematicide is evenly distributed over the treated area in the case of overall spraying by using sufficient water (300 – 400 ℓ/ha) to obtain good coverage.

- The tandem disc or rotorvator must be operated at a depth of at least 15cm and at a speed of approximately 8km/h. to ensure adequate incorporation and mixing of the product with the soil.
- During the ridging process the ridger must not operate deeper than the depth of incorporation, to avoid the inclusion of untreated soil.
- **WARNINGS:**
  - Sufficient moisture is essential to activate the product. Moisture levels close to field capacity are therefore needed when **RUGBY® 20 CS** nematicide is applied and incorporated. Rainfall/irrigation (20-35mm) after application/incorporation is also essential to supplement mixing with and distribution into the soil.
  - The lower parts of the root may show nematode damage in the case of insufficient incorporation/moisture.

CROP/PEST	DOSAGE RATE	REMARKS
<b>GUAVAS</b> Nematodes	7.5 mL/m <sup>2</sup>	Treat canopy area Application must be followed by 35mm irrigation / rainfall on sandy soils and 15mm irrigation/ rainfall on heavy soils, within one week. Repeat annually. <b>SEE MODE OF ACTION</b>
<b>LITCHIS</b> Nematodes		
<b>STONE FRUIT &amp; POME FRUIT (apples &amp; pears)</b> Nematodes	1 to 3 applications of 7.5 mL / m <sup>2</sup> 8 – 10 weeks apart (depending on infestation level)	Use the higher rate on heavier infestations. (i) <b>Spring application</b> should be timed to protect new root flush. Apply follow-up treatment if necessary according to nematode soil analyses (ii) <b>Autumn application</b> as a post-harvest treatment. Apply evenly to the soil in the tree basin (under tree canopy) for an overall surface spray or the area covered by the drip or micro-irrigation system. The number of square meters (m <sup>2</sup> ) to be treated depends upon the size of basin area/canopy. Application may also be made through a drip or micro-irrigation system. If sufficient rain does not fall immediately after application, wash the product into the top layer of soil by sprinkler or micro-irrigation (20 – 35 mm water). Best results will be obtained with young trees – first 2 years after planting. <b>Ensure that product does not come into contact with foliage and fruit. REFER TO WARNINGS.</b> <b>SEE MODE OF ACTION AND REFER TO DIRECTIONS FOR USE: MICRO-JET AND DRIP IRRIGATION SYSTEMS</b>
Ring nematode ( <i>Criconemella xenoplax</i> )	<b>OR</b> 12.5 mL/m <sup>2</sup> followed by 12.5 mL/m <sup>2</sup> 12 weeks later in high infestation	
Dagger nematode ( <i>Xiphinema</i> spp.)	pressure conditions	
Rootknot nematode ( <i>Meloidogyne</i> spp.)		
<b>PINEAPPLES</b> Nematodes	25 L/ha	Spray as an overall application 7 to 15 days before planting and incorporate by means of disc ploughing, to a depth of ± 15 cm as recommended for Chicory and tobacco. Ensure thorough irrigation <b>SEE NOTE AND MODE OF ACTION.</b>



**NOTES: PINEAPPLES:**

- Ensure that the correct amount of **RUGBY® 20 CS** nematicide is evenly distributed over the treated area in the case of overall spraying by using sufficient water (300 – 400 l/ha) to obtain good coverage.
- Best results are obtained when **RUGBY® 20 CS** nematicide is followed up by another registered nematicide in a preventive programme
- The lower part of the root system may show nematode damage in the case of insufficient incorporation / moisture.

CROP/PEST	DOSAGE RATE	REMARKS
<p><b>POTATOES</b>  <b>For soils with &gt;10% clay</b>  <b>Table</b>  <b>Potatoes:</b>            Nematodes  <i>Meloidogyne</i> species            (excluding <i>M.chitwoodi</i>)</p> <p>.....</p> <p><b>For soils with &lt;10% clay and Seed</b>  <b>Potatoes:</b>            Nematodes  <i>Meloidogyne</i> species            (excluding <i>M.chitwoodi</i>)</p>	<p>200 ml per 100 m row length            (20 l/ha. See notes)</p> <p>.....</p> <p>300 ml per 100 m row length            (30 l/ha. See notes)</p>	<p>Apply before planting as an overall soil treatment (See notes) or in a band approximately 30cm wide using a tractor mounted boom spray and incorporate with an offset tandem disk or rotorvator to a depth of 15 – 25cm before making the planting furrow to ensure even distribution.</p> <p><u>Northern Cape and North West Province (winter plantings)</u> – Prieska, Hopetown, Douglas, P.K. Le Roux dam irrigation areas, Vaalharts irrigation area, Barkly West, Christiana, Louwna, Vryburg, Coetzersdam and Tosca, the soil <b>must be fumigated</b> prior to planting.</p> <p>Refer to point 3 under ANNUAL CROPS regarding the use of Vydate® SL foliar follow-up applications.</p> <p>.....</p> <p>Apply before planting as described above, ensuring that the product is evenly distributed and thoroughly mixed with the soil. Prevent excessive direct contact between the product and seed potatoes.</p> <p><u>Northern Cape, North West Province and Sandveld (summer plantings)</u> – Prieska, Hopetown, Douglas, P.K. Le Roux dam irrigation areas, Vaalharts irrigation area, Barkly West, Christiana, Louwna, Vryburg, Coetzersdam, Tosca and the Sandveld the soil <b>must be fumigated</b> prior to planting and application of <b>RUGBY® 20 CS</b> nematicide followed by a complimentary foliar applied nematicide programme (refer to point 3 under Annual crops) should be used.</p> <p><b>SEE NOTES AND MODE OF ACTION</b></p>

**NOTES: POTATOES:**

- Sufficient soil moisture is essential to activate the product. Moisture levels close to field capacity are therefore needed when **RUGBY® 20 CS** nematicide is applied and incorporated. Ensure that the correct amount of **RUGBY® 20 CS** nematicide is evenly distributed over the treated area by using sufficient water (300 - 400 l/ha) to obtain good coverage. Rainfall/irrigation (20 - 35mm) after application /incorporation is also essential to supplement mixing with and incorporation into the soil. Incorporation of the product to the recommended depth is insufficient when irrigation alone is used for this action.
- Crops planted and growing in hot conditions (summer plantings, high temperatures) on very sandy soils, under centre pivot irrigation, in areas with a history of nematode infestations and variable performance of nematicides and source of irrigation water, are significantly more at risk of high levels of damage.

- In conditions such as the above and specifically for plantings in the Northern Cape, North West Province and Sandveld – Prieska, Hopetown, Douglas, P.K. Le Roux dam irrigation areas, Vaalharts irrigation area, Barkly West, Christiana, Louwna, Vryburg, Coetzersdam, Tosca and Western Cape Sandveld region, the soil **must be fumigated** prior to applying **RUGBY® 20 CS** nematicide.
- The highest rate should be applied in the areas and under the conditions mentioned above.
- Always plant certified nematode-free seed
- Do not disturb the soil after planting otherwise the protective barrier layer of **RUGBY® 20 CS** nematicide may be broken.
- The lower part of the root system and/or lower tubers may show nematode damage in cases of insufficient incorporation / moisture or where applications, soil, climatic and cropping conditions are not optimal.
- The nematicidal properties of **RUGBY® 20 CS** nematicide have been clearly proven. **However there are various factors outside FMC’s control which can negatively influence the performance of RUGBY® 20 CS** nematicide. Some of these factors are: mono-cropping or a history of nematode susceptible crops on the potato land, high nematode populations, soil type e.g. very sandy soils, soils with a known history of accelerated microbial degradation, sub-optimal or excessive irrigation/rainfall.
- Should such factors occur substantial nematode damage **MUST BE EXPECTED**.
- As **SEED AND CHIPPING POTATOES** need to be free from any nematode damage, should any such factors be suspected **DO NOT USE RUGBY® 20 CS** nematicide.
- In general, a single application of **RUGBY® 20 CS** nematicide in potatoes, when applied according to the recommendations above, should provide effective (approximately 80%) reduction in nematode numbers for approximately 90 to 100 days. The length of activity is influenced by a multitude of factors and local conditions will vary considerably.
- Potatoes left in the ground for > 100 days will be susceptible to attack by nematodes and will show symptoms of damage. Lift potatoes as soon as the crop potential has been reached, as late infestation can occur. Potatoes are particularly vulnerable to attack once the haulms have been slashed/burnt off as soil temperatures are likely to increase due to the lack of cover - this may stimulate the nematode life cycle resulting in a rapid multiplication and infestation of the tubers. If it is intended to keep the potatoes in the ground for a period longer than the residual activity of **RUGBY® 20 CS** nematicide, a complementary preventive nematicide treatment is compulsory (Refer to point 3 under ANNUAL CROPS regarding the use of Vydate® SL insecticide/nematicide foliar follow-up applications).
- **RUGBY® 20 CS** nematicide is **not registered for application through center pivot systems**.

CROP/PEST	DOSAGE RATE	REMARKS
<b>TOBACCO (UNDER IRRIGATION)</b> Nematodes	15 ℓ per ha	Irrigate to ensure moisture levels close to field capacity. Pre-application field preparation must be such that a fine tilth is obtained free from clods/pieces of organic material and weeds. Apply <b>RUGBY® 20 CS nematicide</b> as an overall application before ridges are made. Treatment must be evenly sprayed, well incorporated and mixed with an offset tandem disc or rotovator. Follow up with 25 mm of irrigation (rainfall). Do not ridge or plant within 3 days after application. <b>SEE NOTES AND MODE OF ACTION.</b>

**NOTES: TOBACCO****DO NOT USE ON DRYLAND TOBACCO.****DO NOT USE ON VERY SANDY SOILS, i.e. LESS THAN 10% CLAY**

- **RUGBY® 20 CS** nematicide can be applied with any suitable tractor mounted boom sprayer that gives an even, uniform distribution on the soil surface. Use sufficient water (300 - 400 l/ha) to obtain good coverage.
- The tandem disc or rotovator must be operated at a depth of at least 15cm (preferably deeper) and at a speed of approximately 8km/h to ensure adequate incorporation and mixing with the soil.
- During the ridging process, the ridger must not operate deeper than the depth of incorporation to avoid the inclusion of untreated soil.
- **Warnings:**
  - Do not use on tobacco under drip irrigation.
  - Do not stress tobacco plants after planting in soil that has been treated with **RUGBY® 20 CS** nematicide.
  - Sub-optimal results have been noted in fields where a dense stand of nutsedge (*Cyperus spp*) was present.
  - The lower part of the root system may show nematode damage in the case of insufficient incorporation/moisture.

CROP/PEST	DOSAGE RATE	REMARKS
<b>GRAPEVINES</b> Nematodes  Ring nematode ( <i>Criconemoides xenoplax</i> )  Dagger nematode ( <i>Xiphinema spp.</i> )  Rootknot nematodes ( <i>Meloidogyne spp.</i> )  Spiral nematode ( <i>Helicotylenus spp.</i> )	1 to 3 applications of 7.5 mℓ / m <sup>2</sup> 8 – 10 weeks apart depending on infestation pressure.  <b>OR</b> 2 applications of 12.5ml / m <sup>2</sup> each 12 weeks apart in high infestation pressure conditions.	Initial application at the onset of Spring. Use the higher rate on heavier infestations. (i) <b>Spring application</b> should be timed to protect new root flush. Apply follow-up treatment if necessary according to nematode soil analyses (ii) <b>Autumn application</b> as a post-harvest treatment.  Apply evenly to moist soil in a 50 cm wide band on either side of the plant row or to the area covered by drip or micro-jet irrigation. The number of square meters to be treated depends on the extent of the irrigation coverage. Application may also be made through a drip or micro-jet irrigation system. In case there is insufficient rainfall immediately after application, wash the product into the top layer of soil by irrigation (20 – 35 mm). <b>SEE MODE OF ACTION AND REFER TO DIRECTIONS FOR USE: MICRO-JET AND DRIP IRRIGATION SYSTEMS</b>

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