

Vydate[®] 10G

NEMATICIDE

Nematicide Stewardship



A guide to best practice
2019/20

 **CORTEVA[™]**
agriscience

Agriculture Division of DowDuPont

INTRODUCTION

USE VYDATE® 10G IN ACCORDANCE WITH THE NEMATICIDE STEWARDSHIP PROGRAMME

The Vydate® 10G label requires that users must comply with the Nematicide Stewardship Programme as defined by the NSP.

The Vydate® 10G label requires that users comply with the Nematicide Stewardship Programme <http://nspstewardship.co.uk/>, principally holding the required certificates for application (PA4g) and having attended the additional stewardship training, provided by Artis https://www.artis-training.com/node/228?title=Nematicide_Stewardship. In addition the application equipment should be calibrated regularly in accordance with NSP stewardship guidelines.

Corteva Agriscience™ promotes effective stewardship throughout its product range, from product manufacture through to final use and beyond. Stewardship supports sustainable agriculture, helps to maintain the environment and safeguards user and public health.

Vydate® 10G is an essential product for the production of potatoes and other root crops, however as with other chemical inputs, it must be used with care according to the label recommendations.

Corteva Agriscience supports Nematicide Stewardship through the NSP provision of training workshops for operators, BASIS qualified advisors and farm managers, as well as an extensive on-farm programme of granular equipment calibrations, ensuring that the correct application rates are applied.



The stewardship of Vydate® 10G has two main objectives:

1. Maximise the benefits derived from product use.
2. Minimise any potential risks to the environment, operators and consumers.

Vydate® 10G is the only carbamate granular insecticide marketed in the UK. It provides effective control of potato cyst and free living nematodes.

Option

Vydate® 10G is approved for the suppression of free-living nematodes (FLN) that damage sugar beet, carrots, and parsnips.

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NEMATICIDE APPLICATION PROTOCOL

Professional advice

Growers must demonstrate that advice has been sought from a BASIS qualified agronomist prior to the purchase and use of a nematicide. Recommendation sheets should be available for each treated field.

Operator requirements

- Operators must be qualified to apply nematicides (NPTC PA4 or PA4G certification).
- By March 2017 staff applying granular nematicides were required to have completed the Industry Stewardship Training module provided by Artis <https://www.artistraining.com/nematicide>. The initial course should be supplemented by the on-line training modules 1 & 2 in subsequent seasons.

Machinery details

- Growers must demonstrate that the granule applicator has been calibrated and checked by a qualified engineer within the last 2 years.
- Rotors or cassettes must be appropriate for the nematicide being applied.

When applying a granular nematicide growers should keep records to demonstrate that:

- The applicator is checked prior to each work day, ensuring all pipework is correctly fitted, the hopper bungs are in place and the hopper lids are secure.
- The applicator is calibrated each week.
- The area treated and the product volume used match for each field.

Protecting the environment – preventing granule spills

Nematicides must be applied and incorporated within a single pass. Applicators should only apply granules within the working width of the rotavator.

By March 2017 all applicators were required to be fitted with a device in cab that allows the operator to shut off nematicide granule flow at least 3 metres from the end of each row. For those applicators fitted with a hydraulic or electric motor this should already be possible. For those applicators driven by a land or spider wheel an electronic clutch should be fitted to the applicator drive shaft to enable remote shut off. <http://www.cropsprayers.com/Horstine/>

- After planting growers should rotavate headlands to ensure no granules are left on the soil surface.
- Growers should use a single site for filling hoppers in each field which can easily be checked for spillages.
- Small spillages should be buried immediately ensuring no granules are left on the surface.

In the case of a larger spillage growers should use the original container to hold the product. Clearly identify the container to avoid re-use. Contact manufacturer for advice on disposal.



Operator exposure

Operators are required to use correct PPE in line with product labels and COSHH. A stable filling platform should be available for safe lifting and emptying of the nematicide containers.

Operators and field supervisors should be aware of the procedures required in the case of an accidental poisoning.

Post application wildlife monitoring

Growers should check treated fields 24 hours post application for any bird or animal carcasses. Any carcasses found may indicate poor incorporation of granules. (If granules are seen on the surface they should be incorporated immediately).

If you suspect the bird or animal has been poisoned please remove and cover the carcass and contact Natural England (Tel: 0800 321600) and the granule manufacturer.

- Vydete® call Corteva Agriscience™ 0800 689 8899
- Nemathorin call Syngenta 0800 169 6058
- Mocap call Certis 01223 894261

USE PLANT PROTECTION PRODUCTS SAFELY. ALWAYS READ THE LABEL AND PRODUCT INFORMATION BEFORE USE.

HYDATE® 10G IN POTATOES FOR CONTROL OF POTATO CYST NEMATODES

General information

Successful and sustainable management of PCN requires an integrated pest management (IPM) approach. Nematicide use can only be part of the solution for PCN and should be viewed as part of the IPM strategy for PCN management.

Key factors to consider

- What is the current rotation?
- When did the field last grow potatoes?
- Has the nematode population been accurately assessed?
- Understand the history of the field in question (point 1).
- Adopt a recognised sampling method e.g. a grid pattern of circa 50 cores across a 1 ha unit area.
- Understand the limitations of soil analysis; it is only a guide.
- Consider all of the factors influencing the potential impact of PCN on a crop to ensure the correct decision is made for each field.
- Relate the PCN count (eggs/g) to soil type and planned potato variety.

With regard to soil sampling

Soil sampling is a skilled activity and best practice recommends a unit sample area of one hectare, even on such small areas hot spots can still be missed. Using a GPS provider will allow more detailed monitoring and return to the same spot to monitor a PCN population over time. Re-test any unexpected results.

Sampling 50 cores of 1 cm diameter, taken at a depth of 10–15cm will result in a sample size of circa 1 kg from the 1 ha block. Send the whole soil sample to your laboratory, DO NOT sub-sample, as this will reduce the accuracy of the analysis. Ask your laboratory to analyse a 2–400g soil sub-sample, rather than the typical 100g sample, this may cost more but it will give a more accurate result which may help

pick up early signs of PCN and prove important later when reviewing varietal tolerance.

Once PCN results are available, consider an appropriate variety and understand the implications of:

- **Tolerance**
- **Resistance**

Will there be adequate nutrition and water supplies to minimise the effects of feeding damage from the nematode populations?

If on examining the results, in association with other factors above, the counts are liable to be damaging, even with the use of a nematicide, consider choosing an alternative field or changing to a more tolerant variety.

If Vydate® 10G is to be applied:

- **Determine soil type**
- **Determine egg count**
- **Determine application methodology**
- **Check label recommendations**
- **Choose an appropriate rate**

With regard to egg count and variety choice

There is very little published data on varietal tolerance to PCN either in terms of individual varietal tolerance or threshold values (eggs/g soil). Growers and agronomists are advised to check with the seed supplier/breeder as to the relative tolerance of a chosen variety. The information printed below is a guide based on feedback from agronomists and growers.

If no information on the variety tolerance to PCN is available, agronomists and growers are advised to assume that the variety is intolerant.

Great care must be taken when growing intolerant varieties, (such as Pentland Dell and Nadine) on PCN infested land. Even with the use of a nematicide these intolerant varieties can still suffer yield loss at counts of less than 20 eggs/g soil. This yield loss will be exaggerated if there are additional adverse factors e.g. poor nutrition, soil structure, or water availability. It may be more appropriate to select an alternative field with a lower count.

Tolerant varieties (such as Cara) can be grown in conjunction with a nematicide on PCN infested land with higher egg counts and still give an acceptable yield providing the crop is not suffering from other adverse or stress conditions. With very high egg counts growers should seriously consider choosing an alternative field with a lower egg count or on appropriate soils use a fumigant/sterilant prior to granular nematicide use.

3 points to always remember

- Due to the varied distribution of cyst nematodes within the field and the inherent inaccuracy of soil sampling, hot spots may still occur in Vydate® 10G treated fields.
- The effectiveness of any granular nematicide including Vydate® 10G is directly linked to the accuracy of application and incorporation.
- A soil sampling result giving 0 eggs/g does not mean an absence of PCN. It simply means that none were found in that particular soil sample. Unexpected results should always be retested.

Pests controlled

Potato Cyst Nematode: *Globodera rostochiensis* and *G. pallida* (all pathotypes).

Application timing pre planting

Broadcast and Incorporation

Planting should take place within 1-2 days of treatment.

**** The soil pH should be established within 9 months prior to planting using a recognised sampling pattern with tested areas no larger than 4 ha.**

Pre harvest interval for

BROADCAST APPLICATIONS IMPORTANT CHANGES

Oxamyl (the active ingredient in Vydate® 10G) is broken down in the soil by a chemical process called Hydrolysis. The rate of hydrolysis is driven by three main factors, soil pH, moisture, and temperature. The breakdown of oxamyl in the soil is slowest on low pH, dry, and cold soils. The use of acidifying agents (detailed below) can lower the pH in the soil ridge and can therefore reduce the rate of breakdown of oxamyl. This may result in a longer time period required for the oxamyl residues in the tubers to reach the Maximum Residue Limit (MRL) of 0.01 mg/kg fresh wt. Early planting in cold soils may also delay the breakdown of oxamyl in the soil.

Broadcast application of Vydate® 10G

For potato crops grown with a soil pH above 6.0**

A minimum of 80 days must elapse from Vydate® 10G application to the point of initial haulm destruction and/or lifting, whichever comes first.

For potato crops grown with a soil pH at or below 6.0**

Growers are advised to take a residue test to ensure the residue level within the tubers does not exceed the current MRL at point of proposed lifting. A minimum of 80 days must elapse from Vydate® 10G application to the point of initial haulm destruction and/or lifting, whichever comes first.

The use of acidifiers with Vydate® 10G (Broadcast and In-furrow)

Acidifying agents amongst which include materials such as ammonium sulphate based fertilizers, liquid fertilizers, zinc sulphate and sulphur treatments should be avoided. When acidifying agents are applied (especially in furrow/bed) they may cause a significant drop in pH within the potato bed/ridge which can delay the breakdown of oxamyl (the active ingredient of Vydate®) in the soil.

Irrespective of soil pH if acidifying agents are applied to the same crop as Vydate® 10G is it recommended the grower adopt a residue testing programme to ensure that residues within the tubers do not exceed the current Maximum Residue Limit (MRL) at the point of lifting. Think forensic science – (see pages 28 and 29 for details).

Soils

Applications may be made on all soil types. However, oxamyl activity may be decreased on shell marl soils with greater than 60% calcium carbonate content.

Rate of use

Short duration crops

For early potatoes (salads, punnet crops etc.) with a planned harvest date at or shortly after the pre harvest interval (PHI) described above, Corteva Agriscience™ recommend a rate of 40kg Vydate® 10G/ha broadcast and incorporated. This rate has proved effective at managing PCN for the shorter growth period associated with these crops.

Longer duration crops

For crops such as second earlies or maincrop which will have a longer growth period/pest exposure, Vydate® 10G may be applied at rates of 40 to 55kg/ha broadcast and incorporated. The 55kg/ha rate may be used on all soil types except true sands. This rate offers the most reliable control of PCN especially on soils infested with *Globodera pallida*.

Soil restrictions

Potato Cyst Nematode infestation	Soil Type	Rate of Vydate®
Any level	Sands	40 kg/ha
Low (less than 10 eggs per gram of soil)	Very light, Light, Medium and Organic or Peat soils	45-55 kg/ha
Moderate-High (10 or more eggs per gram of soil)	All soil types except sands	55 kg/ha

Vydate® 10G applied broadcast and incorporated will suppress Free Living Nematode feeding damage. However the use of Vydate® 10G in this fashion is generally not as effective in the reduction of spraing symptoms as an in furrow application of 210g Vydate® 10G per 100m row.

Application advice

PRIOR TO APPLICATION CHECK:

- Machinery is calibrated using 'real product' at the start of each season.
- In season, flow rates are checked using Vy-Cal calibrated measuring cylinders.
- In both of these operations please ensure correct PPE is used.

The aim for overall application against PCN is to ensure even distribution of Vydate® 10G granules within the soil volume of the ridge/bed to ensure that developing roots/daughter tubers are protected. **VYDATE® 10G MUST BE APPLIED AND INCORPORATED IN A SINGLE PASS.**

Corteva Agriscience™ recommend the use of Positive Displacement Applicators. These applicators have an individual metering unit for each outlet which allows individual calibration and therefore uniformity of application across the working width.

Corteva Agriscience have concerns with the use of applicators fitted with a single metering unit serving multiple outlets. These machines require some form of secondary product split before reaching the outlet. Experience has shown that this type of applicator may have significant variation in output per outlet, risking under, or overdosing across the working width.



The use of applicators such as TMA4's are no longer permitted to apply Vydate® 10G.

Care should be taken to ensure that banding (concentration of product in one area of soil profile) and/or overdosing of Vydate® 10G granules due to poor incorporation or machinery set-up, does not occur. If product is banded, control of PCN may be compromised. Banding in the soil zone of daughter tuber production may also increase the risk of oxamyl residues being detected.

Using a rotavator (bed tiller) to incorporate Vydate® 10G

For best results Corteva Agriscience™ recommend the use of rotavators which will evenly incorporate the granules in the top 10–15cm of soil working in a vertical plane, such as a Rotospike or Baselier.



If applying Vydate® via a front mounted applicator and bed tiller ahead of the planter, ensure that the working depth of the bed tiller is at least the same depth as the planter 'shoe' opening the ridge on the planter. This will ensure untreated soil from below the treated zone is not lifted back into the final planted ridge.



Horizontal mixing not adequate.

Corteva Agriscience do not recommend the use of Power Harrows working in a horizontal plane (in the same fashion as stirring a spoon in a cup of liquid). These machines may not adequately mix the Vydate® 10G granules in the soil profile which can result in banding or over concentration of product in the top 5cm of soil.

Please ensure that fishtail outlets are sited to ensure an even granule application to the soil surface within the working width of the rotavator. Both the distance between fishtails and their height above the ground must be checked. Avoid granule application outside the working width of the machine either by direct placement or soil movement as this may result in uneven dosing of product.



A good set up – product applied evenly across working width and immediately incorporated.



Problem set up – fishtails applying product outside working width.



Here the fishtails are set too high and granules may be affected by wind; blown outside of working width.



Landwheel drive pointers

The traditional spider land wheel may be perfectly adequate for metering nematicides accurately, but do ensure that:

1. It has all its spines.
2. Spines are not over worn (spine ends should be flat).
3. The spider wheel does not skid/drag in lighter soils.
4. If using belt/pulley rather than chain/sprocket drive, there is no slippage on the belt.
5. Always check diameter of the land wheel before calibration.



If spines are worn to a degree which reduces the circumference of the spider this could increase the rate applied.

Older applicators are perfectly capable of applying Vydate® 10G accurately if maintained and calibrated correctly. In this case moving the land wheel to the centre of the worked bed reduces the risk of skid and under-application.

Using a heavier land wheel and a sprocket and chain drive can be more reliable.



When using a stone separator

Apply Vydate® 10G at 55kg/ha (40kg max for short duration crops) to minimise any effects of banding/dilution.

Warning

The use of stone and clod separation equipment to incorporate Vydate® 10G can result in poor control of nematodes due to dilution or banding in the soil. Extra care must, therefore, be taken to ensure even distribution of the product in the top 10-15cm of soil when mechanical stone separation equipment is used. The risk of over dilution will clearly be greater where less than 55kg/ha is applied.

Application of product on "star" type separators is not recommended.

Corteva Agriscience™ advise caution when applying Vydate® 10G on "star" type de-stoners as the granules will invariably be banded in the 0-5cm of the soil profile, requiring at least a further pass with a bed tiller to incorporate fully within the planted bed. Destoners which mix 'stars' and 'webs' within the machine should be treated as a "star" machine.





Not only do stars fail to mix the soil and nematicide granule but the design often prevents the applicator outlets being close to the share at the front of the machine.



Web-only destoners do mix the soil more thoroughly as it passes over the webs, and may therefore allow application of Vydate® 10G, however there is a significant risk of over dilution of the nematicide depending on the depth of working and banding is still possible, particularly on light and dry soils which will pass through the first web very readily.

Outlets (fishtails) should therefore be placed as close to the front of the first web as the PTO will allow to minimize this risk. Where rates of less than 55kg are to be applied, application via a web destoner is not recommended.

Incorporation

Granules must be applied and incorporated in a single pass, ideally to a depth of 10–15cm, depending on planting depth. Rotary cultivators working in a vertical plane (such as a Rotospike e.g. Baselier) are recommended for incorporation.

Use of electric and hydraulic motors to power granule application units

Application equipment utilising hydraulic or electric motors are prone to overdosing at the start and finish of a row.

This overdosing is linked to the time taken for the tractor to reach full forward speed at the start of the row and late disengagement of the motor at the end of the row.

Growers are advised to fit a drive isolation device which allows the motor to start application only when the tractor has reached full forward speed and must have the facility to disengage the motor well before the end of the row.

Overdosing must be avoided to help prevent residue exceedences.

VYDATE® 10G IN POTATOES FOR FREE LIVING NEMATODE SUPPRESSION

In furrow applications important changes

Oxamyl (the active ingredient in Vydate® 10G) is broken down in the soil by a chemical process called Hydrolysis. The rate of hydrolysis is driven by three main factors, soil pH, moisture, and temperature. The breakdown of oxamyl in the soil is slowest on low pH, dry, and cold soils. The use of acidifying agents (detailed below) can lower the pH in the soil ridge and can therefore reduce the rate of breakdown of oxamyl. This may result in a longer time period required for the oxamyl residues in the tubers to reach the Maximum Residue Limit (MRL). Early planting in cold soils may also delay the breakdown of oxamyl in the soil.

In furrow application of Vydate® 10G

Growers choosing to use Vydate® 10G in furrow are advised to implement a residue test to ensure the residue level within the tubers does not exceed the current MRL (0.01mg/kg fresh wt) at point of proposed lifting. A minimum of 80 days must elapse from Vydate® 10G application to the point of initial haulm destruction and/or lifting, whichever comes first.

For more information on likely harvest intervals please consult Corteva Agriscience Limited or your agronomist.

The use of acidifiers with Vydate® 10G (Broadcast and In-furrow)

Acidifying agents amongst which include materials such as ammonium sulphate based fertilizers, liquid fertilizers, zinc sulphate and sulphur treatments should be avoided. When acidifying agents are applied (especially in furrow/bed) they may cause a significant drop in pH within the potato bed/ridge which can delay the breakdown of oxamyl (the active ingredient of Vydate®) in the soil.

Irrespective of soil pH if acidifying agents are applied to the same crop as Vydate® 10G is it recommended the grower adopt a residue testing programme to ensure that residues within the tubers do not exceed the current Maximum Residue Limit (MRL) at the point of lifting. It is critical that a potato crop is sampled in the correct way to ensure an accurate result is achieved. The MRL is set (November 2007) at 0.01 mg/kg of tubers (10 parts per billion). It is very important that no contamination of the tuber sample should occur. Think forensic science – (see pages 28 and 29 for details).

Recommendations for use

Corteva Agriscience Limited offers two in furrow recommendations for Vydate® 10G to help manage free living nematodes in the potato crop. This allows the agronomist/grower to choose an appropriate rate to match the **perceived risk** for each field situation.

Vydate® 10G applied broadcast and incorporated will suppress Free Living Nematode feeding damage. However the use of Vydate® 10G in this fashion is not generally as effective in the reduction of spraing symptoms as the in furrow application of 210g Vydate® 10G per 100m row.

140g/100m row:

(Applies approximately 16kg of Vydate®10g per hectare, based on 36 inch rows or 1.8m beds).

- Reduces Free Living Nematode feeding damage.
- Lowers the multiplication rate of Free Living Nematodes.
- Offers some yield protection.

210 g/100m row:

(Applies approximately 24kg of Vydate®10g per hectare, based on 36 inch rows or 1.8m beds).

- Reduces Free Living Nematode feeding damage.
- Lowers the multiplication rate of Free Living Nematodes.
- Offers some yield protection.
- Provides suppression in the transmission of TRV by reducing Free Living Nematode feeding activity during the early stages of crop development. However this will be influenced by some of the factors outlined below under the heading “With regard to spraing”.

With regard to spraing:

- Potato varieties vary in terms of their susceptibility to express the symptoms of spraing.
- This should be taken into account when choosing to plant fields that are considered “at risk” from spraing.
- Planting cereal crops, especially spring barley, within the rotation prior to potatoes and good broad-leaved weed control within these crops will reduce the TRV level in the field.
- Currently there is insufficient scientific evidence to support a correlation between FLN numbers and expression of spraing symptoms within a crop.
- Detection of TRV within the field weed population is probably a more valid test for risk management purposes should it become commercially available.

With regard to the use of nematicides to reduce the symptoms of spraing:

- Vydate® 10G offers suppression of the symptoms of spraing. As with all nematicides it may not always provide complete control. There is a risk that treated crops may still show symptoms of spraing and could be rejected by the processor.

When using Vydate® 10G:

- Where possible, ensure that fishtails are fitted to outlets to give the best granule distribution.
- The granule applicator must be linked to forward speed, e.g. direct drive from planter wheel.
- Machinery is calibrated using real product at the start of each season.
- When using land wheel applicators, machinery should be rechecked at least once in the field and periodically during the season.
- In season flow rates should be checked using Vy-Cal.

Use of hydraulic motors to power granule application units

Application equipment utilising hydraulic or electric motors are prone to overdosing at the start and finish of a row. This overdosing is linked to the time taken for the tractor to reach full forward speed at the start of the row and late disengagement of the motor at the end of the row.

Growers are advised to fit a drive isolation device which allows the motor to be started only when the tractor has reached full forward speed and it is a requirement for the motor to be disengaged well before the end of the row.

Overdosing must be avoided to help prevent residue exceedences.

Examples of planter set up

Access to applicator aided by steps and operator platform for filling the hopper provides good operator safety when handling Vydate® 10G Ecolite® containers. Gravity delivery to an outlet at the front of the planting 'shoe' will ensure Vydate® 10G is placed close to the seed tuber.



NEMATICIDE STEWARDSHIP

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Gravity delivery with outlet at front of the planting shoe, placing a ribbon of Vydate® 10G immediately under the seed tuber (spread by bolt through outlet pipe).



Lower hopper aids filling for the operator and the fan ensures delivery to the small (3") fishtails placed at the front of the planting shoe, to provide a even mixture of Vydate® in the soil under the seed tuber. Vydate® is metered into individual pipes delivering the required rate to each row.



POTATO SAMPLING FOR OXAMYL RESIDUE TEST

There is no defined industry protocol for taking a potato tuber sample for residue analysis. The details below are based on practical experience.

When sampling, consider two key factors:

1. Achieving a representative sample from the field (minimum 2.5kg tuber weight).
2. Ensuring good sample hygiene to avoid contamination.

On very early crops it may be necessary to take all the tubers from each of 20–40 plants across the field to get a suitable weight of tubers.

As the crops mature and tuber size increases it may be more appropriate to take a single tuber from 20–40 plants across the field.

In terms of sampling pattern, a 'W' or grid pattern within the field will provide a fair representation of the field crop. Care should be taken to avoid taking too many samples from the same bed.

- The MRL is set at 0.01 mg/kg of tubers (potato tissue, not additional soil).
- It is very important that no contamination of the tuber sample should occur. Think forensic science.
- Sampling equipment should be cleaned before each sample (use of sterile alcohol wipes may prove a useful addition to sampling kit).
- The sampler is advised to wear new disposable gloves for each sample.
- Tubers should be collected into a clean bag/bucket, stored and transported in a clean environment.
- Excess soil should be removed from tubers as they are collected.

- Samples must be washed and dried (again consider risk of cross contamination) before sending to the lab.
- This process is time-consuming, taking shortcuts will increase the risk of inaccuracy.

Understanding the Maximum Residue Limit (MRL)

Oxamyl, the active ingredient in Vydate® 10G, is broken down in the soil by a chemical process called hydrolysis. This is driven by three main factors, pH, temperature, and moisture. The breakdown of oxamyl is slowest under acidic, cold conditions.

Under normal conditions the MRL will be reached by 80 days' post application. However, growers and agronomists need to consider that adverse environmental factors linked to the hydrolysis process will delay the time taken to reach the MRL.

Please take this into account when considering the use of Vydate® 10G on early planted short duration crops.

For further information relating to VYDATE® 10G please contact the Corteva Agriscience™ Technical Hotline on 0800 689 8899 or ukhotline@corteva.com

VYDATE® 10G IN SUGAR BEET

General information

Vydate® 10G should be used wherever sugar beet seedlings are vulnerable to early insect attack, or where the field has a history of Docking disorder. It is particularly important to protect seedlings when drilling to a stand. Vydate® 10G will also provide some suppression or early aphid infestations associated with virus yellows, though should not be considered a substitute for aphid monitoring and subsequent insecticide use.

Pests controlled

Longidorus spp. and *Trichodorus* spp. (Docking disorder).
The soil pest complex including millipedes. Pygmy beetle.
Mangold fly (Leaf miner).

Crop safety

All commonly grown varieties may be treated.

Timing

At drilling.

Pre harvest interval

A minimum of 12 weeks must elapse from Vydate® 10G application to crop lifting.

Soils

Applications may be made on all soil types.

Rate of use

For control of Docking disorder and to improve plant stand by giving some protection against early attack by millipedes, pygmy beetle and leaf miner. 30g/100m row, which is equivalent to 6kg/ha at 53 cm row spacing.

Application

The granules must be applied in the seed furrow at drilling. Guide settings for the appropriate application machinery are given in the calibration section.

HYDATE® 10G IN CARROTS AND PARSNIPS

General information

Vydate® 10G may be used for the suppression of plant parasitic nematodes resulting in some reduction in fanging caused by nematode feeding.

Crop safety

All commonly grown varieties may be treated.

Timing

At drilling.

Pre harvest interval

A minimum of 12 weeks must elapse from Vydate® 10G application to crop lifting.

Soils

Applications may be made on all soil types.

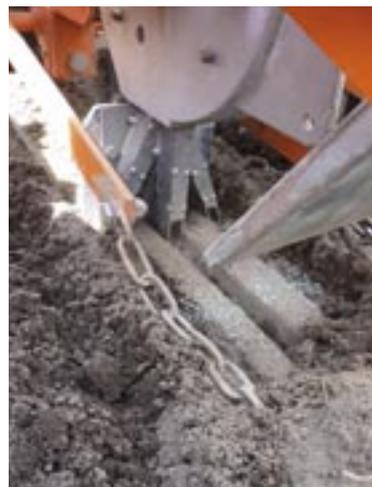
Rate of use

Apply Vydate® 10G at 90g/100m row, which is equivalent to 18-20 kg/ha depending on bed sizes (calculated as 1.8m and 2.0m width).

Application

Ensure that granules are adequately covered by soil during the application process. The label states that granules must be applied and incorporated to a depth of 2.5cm. On certain drill types this may require the delivery fishtails to be moved forward, closer to the point of seed delivery.

Granules applied and fully covered by soil as drill moves ahead.



Seed row pressed, note no granules visible on surface.



APPLICATOR CALIBRATION

All growers should ensure that the nematicide applicator is calibrated accurately prior to use each season. Corteva Agriscience™ run a number of grower workshops each season and will visit growers to facilitate the calibration process. Contact details are supplied at the end of this document should you require further assistance.

In season calibration checks

It is a requirement under the NSP for users to check application rates at regular intervals during the season of use, to ensure the target dose is still being met to avoid under or over application across the whole working width of the machine.

Corteva Agriscience have supplied all growers currently enrolled on the Vydate® 10G Stewardship Programme with a set of Vy-Cal tubes which allow for quick in season checks. The photo below shows an applicator giving even application across the outlets. If you require Vy-Cal tubes please contact Corteva Agriscience (details at the end of this document).



ENVIRONMENTAL SAFETY

Risk to wildlife and birds

To safeguard wildlife it is essential that all granular nematicides are applied and fully incorporated into the soil in a single pass and that there are no granules left on the surface. Any nematicide granule left on the soil surface, whether that be from poor incorporation, spillage during filling or by failing machinery, will put wildlife and birds at risk. Any small spills should be buried immediately. Larger spills should be removed to an empty nematicide container, clearly labelled and returned to the manufacturer. Granules left on the soil surface or spills are infrequent and only occur when something goes amiss. A well-set machine that is correctly serviced rarely causes a problem. Corteva Agriscience™ do not support the use of boom type applicators such as TMA4 machines where granules are left on the soil surface ahead of the incorporation pass.

Granule spill on row end when applicator not switched off in time.



Exposed granules may pose a risk to wildlife. To prevent granules being left on the soil surface at row ends, shut-off the applicator two to three meters from the end of the working strip. This ensures that all granules have left the delivery tubes by the time the machine is lifted from the soil. A land-wheel continuing to turn after the applicator has been lifted out of work will cause product to be applied to the soil surface.

This may be achieved remotely from the tractor cab by one of the following approved systems:

- Electric clutch
- Cable clutch
- Hydraulic land wheel lift
- Computer controlled drive

It is now a requirement under the Nematicide Stewardship Programme (NSP) that all application machinery have a means of shutting off nematicide delivery 3m prior to lifting the machine out at the end of a run.

Below left is an example of an electric clutch fitted to a carrot drill (clutch is universal and available from Horstine Farmery).



Below right, close up of Horstine Farmery clutch fitted to sprocket drive.



Headlands – specific advice

Following field planting or at the end of each planting session a rotavator should be used across the row ends to ensure any granules on the surface are fully incorporated.

The following could cause major spillage yet can be rectified for little expenditure.

- Split bungs and perished pipework



Risk to surface water

There has been no detection of oxamyl (the active ingredient in Vydate® 10G) in surface water. However it is critically important that growers and operators adopt sensible precautions when working close to water courses and ditches. This applies to all nematicides.

SAFEGUARDING THE OPERATOR

Always read the label and machinery instructions before working with granular applicators.

Safe working conditions

With the development of enclosed transfer systems, such as the DuPont™ Ecolite® system, the greatest risk to the operator is likely to be physical rather than chemical.

Always arrange machinery so that the user is working comfortably from the ground or from a raised stage and that filling takes place downwind to avoid any dust that might escape the hopper.



New product introductions such as those shown above are designed with operator use in mind. As you can see, the applicator unit can be filled at ground level rather than requiring the operator to climb on the machine.

Always maintain the applicator to the highest standard, breaking pipework and failing bungs not only risks the environment but adds extra risk to the user. Undertaking a calibration check before the season allows for quick, accurate and safe changes of product rate during application.

Safety precautions

OPERATOR PROTECTION

- Oxamyl is an anticholinesterase carbamate. Handle with care. DO NOT USE if under medical advice NOT to work with such compounds.
- DO NOT APPLY via hand-held equipment.
- Engineering control of operator exposure must be used where reasonably practicable in addition to the following personal protective equipment:

(a) Opening container, coupling to applicator, adjusting applicator and dealing with spillages.

Suitable protective clothing (coveralls), suitable protective gauntlet gloves and either face protection (faceshield) or suitable respiratory protective equipment and eye protection (goggles).

(b) Cleansing applicator after use.

Suitable protective clothing (coveralls, apron), suitable protective gloves, rubber boots and face protection (faceshield).

(c) During granule placement by tractor drawn/mounted applicator.

Suitable protective clothing (coveralls).

CONTACT CORTEVA AGRISCIENCE™

For any further information or advice on Vydate® 10G please contact the Corteva Agriscience™ Technical Hotline on 0800 689 8899 or ukhotline@corteva.com

For details of your nearest NSTS qualified test centre/ engineer capable of conducting a professional applicator MOT and calibration visit:

<http://www.nsts.org.uk/Find-your-nearest-Test-Centre>

FOLLOWING THE LABEL AND THESE STEWARDSHIP GUIDELINES WILL ENSURE THE SAFE APPLICATION OF NEMATICIDES.

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Agriculture Division of DowDuPont

Use plant protection products safely. Always read the label and product information before use. For further information including warning phrases and symbols refer to label.

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