

THE BAYER CROPSCIENCE SEEDGROWTH CENTRE. THE ONLY SEED TREATMENT FACILITY OF ITS KIND IN AUSTRALIA.

The Bayer CropScience SeedGrowth Centre at Pinkenba in southern Queensland is located on the banks of the Brisbane River, approximately 10 km north east of Brisbane.

This facility is one within a Bayer global network and Bayer is the only seed treatment supplier with such an innovative facility in Australia.

As one of the world's leading R&D companies, we challenge ourselves to always be moving forward, offering our customers the best technology, the best products and the best outcomes.

R&D focus for optimal results.

Early development work is centred around understanding the activity of active ingredients on the pest or target disease and the effect on a plant's growth. Later R&D focuses on how the formulated product can be applied through different machinery to different seeds to ensure effective application and performance.

Flexible and responsive.

Queries from seed companies, treaters, agronomists and growers regarding how to apply a seed treatment can be rapidly tested and recommendations supplied. As a research facility, smaller seed lots can be treated to ensure accurate application for commercial field trials.

Testing capability with high volume equipment.

Our state-of-the-art high volume production equipment tests new and existing seed treatments to ascertain what will happen in the field.

Skilled and adaptable staff.

Dedicated staff specialising in seed treatment application offer a support service to the agricultural industry. The Australian facility is part of the global network of Bayer Seed Treatment Application Centres that can draw on a wealth of experiences to remain at the forefront of any changes in global or local requirements.

For further information on Bayer's Seed Treatment products or to enquire about seed loading tests, please contact your local Bayer CropScience Territory Sales Manager or call 1800 804 479.



www.bayercropscience.com.au

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Always read the label for full instructions. The information and recommendations set out in this brochure are based on tests and data believed to be reliable at the time of publication. Results may vary, as the use and application of the products is beyond our control and may be subject to climatic, geographical or biological variables, and/or developed resistance. Any product referred to in this brochure must be used strictly as directed, and in accordance with all instructions appearing on the label for that product and in other applicable reference material. So far as it is lawfully able to do so, Bayer CropScience Pty Ltd accepts no liability or responsibility for loss or damage arising from failure to follow such directions and instructions.

Sept 2013



Guide to Applying Seed Treatment 2014



Bayer SeedGrowth™

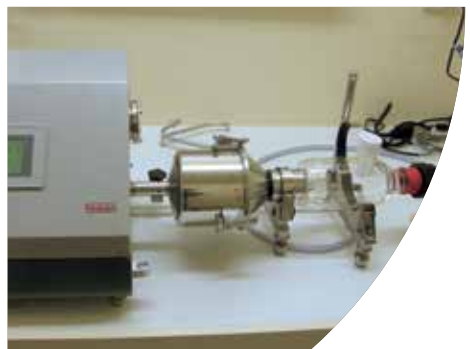
SEED QUALITY

Seed quality is a major factor in achieving optimum seed treatment results. Two key considerations that influence seed treatment quality are the cleanliness of seed (removal of impurities and organic dust) and the calibration of seed sizes.

Only well cleaned and graded (sized) seed should be treated. The presence of dust will result in large amounts of seed treatment product not adhering to the seed but rather adhering to the dust particles. This will result in patchy and uneven coverage of the seed treatment and potential underdosing.

Dust has a very large surface area compared to seed and thus can remove a significant amount of the fungicide or insecticide being applied. This means that the product is lost and the performance of the product will be reduced. This can result in unacceptable disease control due to the fungicide not being applied to and sterilising the entire seed surface, or insect control only lasting 3 weeks when 6 weeks is claimed.

Bayer CropScience offers a 'seed to seed loading' service where the active ingredient is washed off the seeds to determine how much product is on the individual seeds rather than just how much is on the entire volume of grain.



PRODUCT QUALITY

Don't risk your crop yield with poor quality seed treatment products.

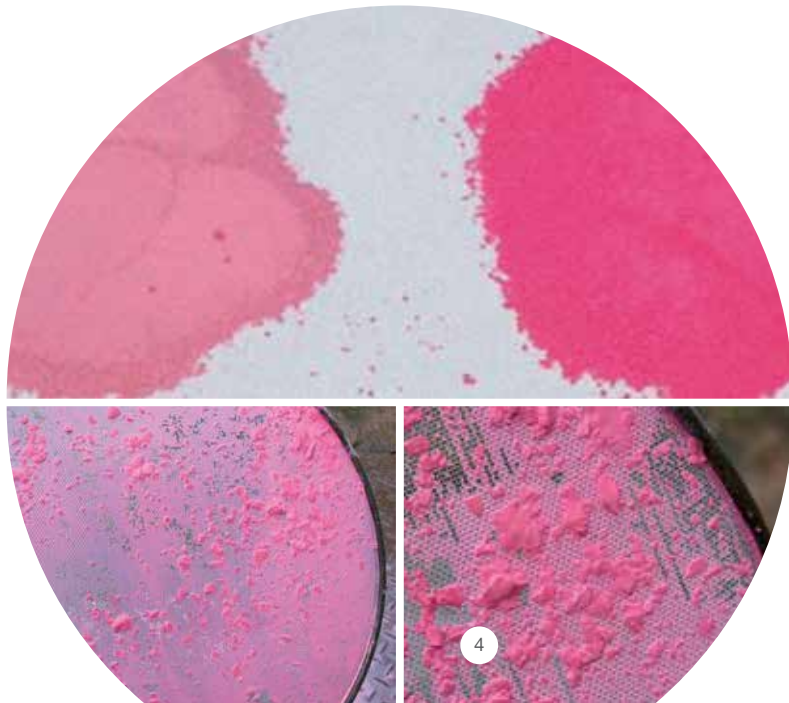
To ensure that your seed treatment is the best quality, it is important to make sure you're using high quality seed treatment products. There are several factors that affect product quality including; raw materials and inputs, manufacture, consistency and quality of formulation, and particle size.

Questionable product quality can lead to poor product reliability and potentially poor disease protection for growers. All seed treatment products require even seed to seed coverage to protect against fungal diseases and insect pests. If product quality and consistency is low, even application may be compromised and therefore disease and/or insect control reduced.

Products can become lumpy, separate in solution, stick to equipment rather than seed, and are difficult to use. Don't risk your machinery and reputation by using inferior products.

Bayer CropScience is a global leader in research and development with a commitment to manufacturing the highest quality product formulations available.

Different formulation qualities affecting product's stability and sedimentation properties.



◀ Similar formulation, different manufacturing process and product quality.

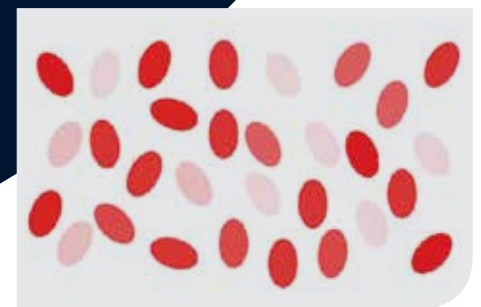
◀ Poorly formulated product with lumpy parts that adhere to the top of the drum.

SEED COVERAGE

When assessing seed treatment application coverage, both 'patchiness' and 'evenness' should be considered.

Patchiness is a measure of how patchy a seed's coverage is when a seed treatment product has been applied. If a seed looks patchy then this is an indication that the treatment has not been applied well to the seed. Increased patchiness is undesirable and may result from under or over-mixing, poorly cleaned seed or poor slurry preparation.

Evenness is a measure of how even the coverage of a seed treatment product is when comparing seed to seed. Applicators should aim for high homogeneity and comparable evenness amongst treated seeds.



EVENNESS AND PATCHINESS IS DIRECTLY INFLUENCED BY:

1. SEED QUALITY
2. PRODUCT QUALITY
3. AMOUNT OF DUST AND INERTS
4. TOTAL SLURRY VOLUME (PRODUCT + WATER) APPLIED
5. TYPE OF TREATER USED
6. AMOUNT OF MIXING AND SECONDARY AUGER MOVEMENT

Bayer CropScience runs two day seed treatment application courses exploring these influences and more at its dedicated SeedGrowth Centre in Pinkenba, Queensland. If you are interested in attending one of the courses please contact your local Bayer CropScience Territory Sales Manager for more details.

AVOIDING IMPURITIES

The cleanliness of seed (removal of impurities such as straw, husk and organic dust) is a major factor that needs to be considered when treating seed with a seed treatment.

Only well cleaned seed should be treated. The presence of dust is a major problem due to its very large surface area compared to seed. This increased surface area of dust binds seed treatments taking active ingredient away from seed, resulting in large amounts of seed treatment not adhering to the seed but rather adhering to the dust particles where it is not wanted. This can result in patchy and uneven coverage of the seed which may reduce the efficacy of the treatment and compromise the treatment equipment.

Poorly cleaned seed will have approximately 0.1 – 0.2% dust in weight. Well-cleaned seed has less than 0.05% weight in dust. Data suggests that for every 0.1% of dust, approximately 10% of active ingredient is lost from the seed.

Images 1 and 2 show a wheat sample before and after cleaning. Note the dust and organic matter have been cleaned out of the sample. Well-cleaned seed should have this appearance.



SEED TREATMENT APPLICATION

Correct application of seed treatment product is essential to ensure adequate disease and insect protection for your crop.

TIPS:

SEED

- Seed quality is very important. Seed should be well cleaned and graded before seed treatments are applied.

PRODUCT

- Use high quality seed treatment products for disease and insect protection and the best potential for a high quality and high yielding crop.
- Make sure you know what product you're using and ensure you understand what diseases or insects the product is indicated for.

APPLICATION

- Ensure you apply seed treatment products within the suggested label guidelines. Contrary to what some applicators believe, adding water as per the label rates will help to ensure improved coverage of the active ingredients on seed rather than 'weakening' the product.
- Colour dyes in seed treatment products are not the active ingredient. It is important to remember that a more intense colour on the seed doesn't necessarily result in more active ingredient.
- The name of the game is 'even seed to seed coverage'. Be careful not to over-mix seed as this will result in the seed treatment product being rubbed off the seed surface. Often treated seed is moved through many augers – treater to silo to truck to planter. This should be minimised as much as possible, as once seed is dry, augering may grind products off the seed.

EQUIPMENT & SAFETY

- Before use, be sure to check that all application equipment is in good working order.
- Always ensure you follow the product safety data sheet and label guidelines.
- When using seed treatment products, ensure you use approved and recommended safety equipment.

APPLICATION SAMPLES

One of the largest influences on achieving well treated seed is "slurry volume" used (product + water), assuming that as much dust as possible has been removed.

Cereal seed is dry and absorbs moisture from the seed treatment. Generally, a slurry volume of about 4 – 6 L/t is required to achieve even application of the fungicide or insecticide over each and every seed being targeted.

The following samples show the visual effect of altering the slurry volume. Only the water volume was altered.

PAGE NO.	PRODUCTS	APPLICATION RATE (PER TONNE)	WATER DILUTION RATE (PER TONNE)	TOTAL VOLUME	SEED TYPE
10	EverGol® Prime	0.8 L	0.8 L	1.6 L*	Barley
11	EverGol Prime	0.8 L	4.8 L	5.6 L	Barley
12	EverGol Prime	0.8 L	1 L	1.8 L*	Wheat
13	EverGol Prime	0.8 L	4.2 L	5 L	Wheat
14	Baytan® T	1 L	1 L	2 L*	Barley
15	Baytan T	1 L	4 L	5 L	Barley

*Please note this is not a recommended water dilution rate.

Note: The same grain source was used for each comparison. The seed was treated using a Cimbria CC-Lab, Brisbane (2011 – 2012).

APPLICATION SAMPLES

PRODUCT **EVERGOL PRIME**

PRODUCT APPLICATION RATE:	0.8 L per tonne
WATER DILUTION RATE:	0.8 L per tonne
TOTAL APPLIED VOLUME:	1.6 L per tonne [#]

[#] refer to label as total slurry volume is below what is recommended.

SEED **BARLEY**

SAMPLE COMMENTS: Due to the low water dilution rate, the barley seed has a very patchy and uneven treatment. Note the small patches of red and the larger bare areas on the seed. This is a poor application and could potentially result in poor disease control.

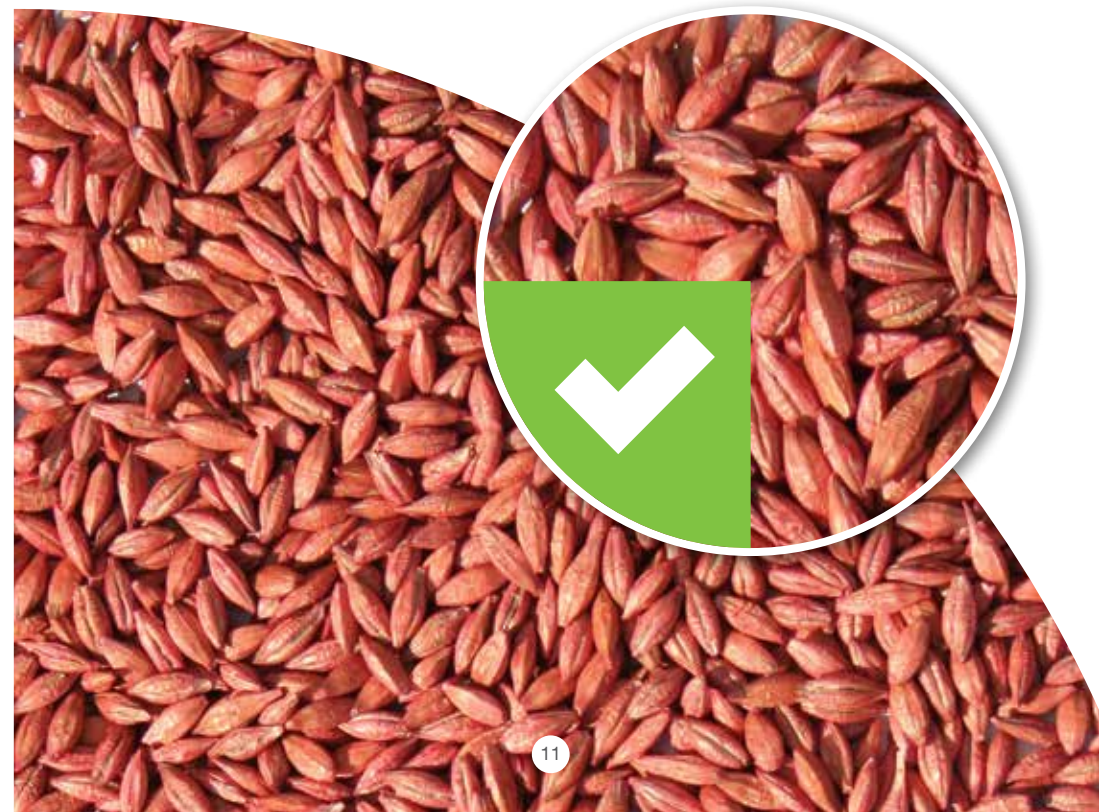


PRODUCT **EVERGOL PRIME**

PRODUCT APPLICATION RATE:	0.8 L per tonne
WATER DILUTION RATE:	4.8 L per tonne
TOTAL APPLIED VOLUME:	5.6 L per tonne

SEED **BARLEY**

SAMPLE COMMENTS: A higher water dilution rate improves seed to seed coverage and spread of the treatment over the barley seed. There is a much higher consistency across the sample with less patchiness. This sample represents a good application.



APPLICATION SAMPLES

PRODUCT **EVERGOL PRIME**

PRODUCT APPLICATION RATE:	0.8 L per tonne
WATER DILUTION RATE:	1 L per tonne
TOTAL APPLIED VOLUME:	1.8 L per tonne [#]

[#] refer to label as total slurry volume is below what is recommended.

SEED **WHEAT**

SAMPLE COMMENTS: Due to the low water dilution rate of EverGol Prime, coverage of the seed is poor. This is an example of a poorly treated seed as the seed is mostly uncovered by the treatment. Note that the treatment is patchy and uneven.

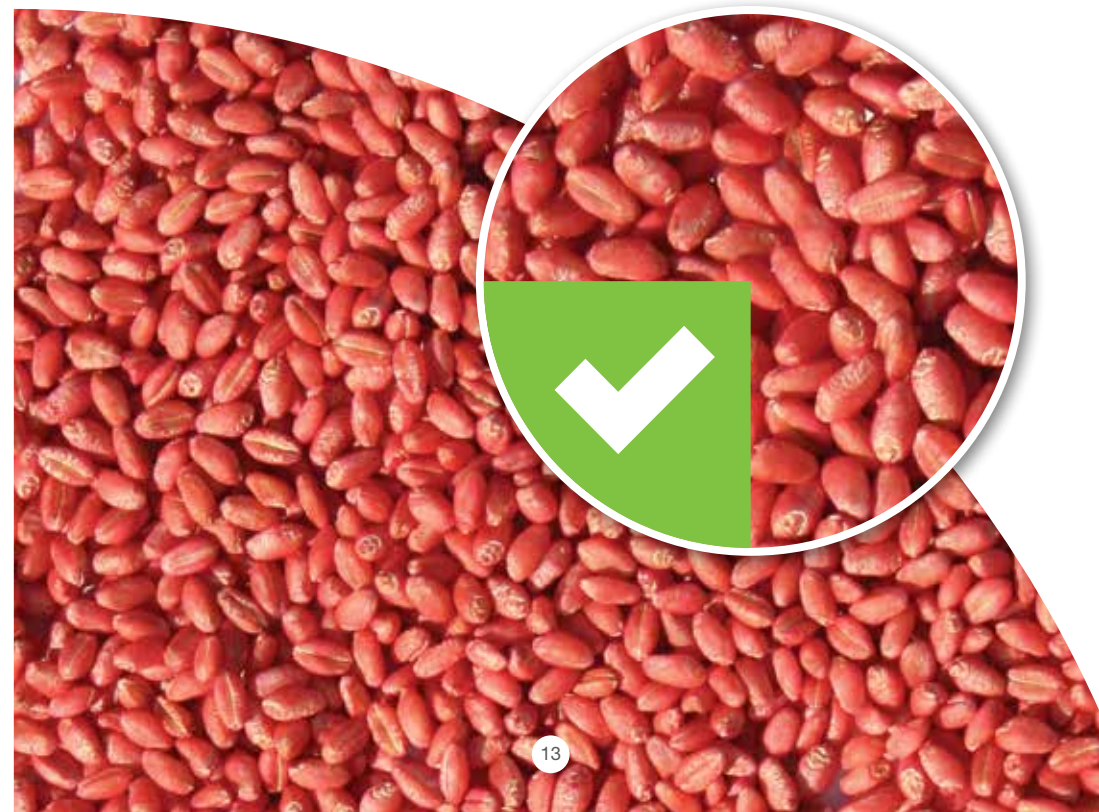


PRODUCT **EVERGOL PRIME**

PRODUCT APPLICATION RATE:	0.8 L per tonne
WATER DILUTION RATE:	4.2 L per tonne
TOTAL APPLIED VOLUME:	5 L per tonne

SEED **WHEAT**

SAMPLE COMMENTS: This is a vastly improved sample due to the high water dilution rate. Coverage has significantly improved as seen by the even and deeper red colouring of the seed. There is very little patchiness and the seed has very good seed to seed coverage. This sample represents good application.



APPLICATION SAMPLES

PRODUCT **BAYTAN T**

PRODUCT APPLICATION RATE:	1 L per tonne
WATER DILUTION RATE:	1 L per tonne
TOTAL APPLIED VOLUME:	2 L per tonne [#]

[#] refer to label as total slurry volume is below what is recommended.

SEED **BARLEY**

SAMPLE COMMENTS: Due to the low dilution rate, the barley seed has a very patchy and uneven treatment. Note the small patches of blue and the large bare areas of the seed. This is a poor application and is likely to result in poor disease control.



PRODUCT **BAYTAN T**

PRODUCT APPLICATION RATE:	1 L per tonne
WATER DILUTION RATE:	4 L per tonne
TOTAL APPLIED VOLUME:	5 L per tonne

SEED **BARLEY**

SAMPLE COMMENTS: A higher water dilution rate improves seed to seed coverage and spread of the treatment over the barley seed. There is a much higher consistency across the sample with less patchiness. This sample represents good application.



PRODUCT PROFILES

- Powerful group 7 SDHI active ingredient penflufen.
- Market leading suppression activity on rhizoctonia root rot.
- Leading plant health improvements through effective disease control.
- Up to 20% yield increase in wheat and barley compared to untreated crops.
- Control of smut diseases* (including bunt).
- Excellent crop safety with no delay in emergence.
- Effective disease control resulting in stronger, fitter plants with improved biomass, improved root mass and reduced spear-tipping.
- Flexible use rate.

* Suppression of soil-borne flag smut.



EverGol
Prime

PRODUCT TYPE	Fungicide
ACTIVE INGREDIENT	240 g/L penflufen
FORMULATION TYPE	Flowable concentrate for seed treatment
PACK SIZE(S)	10 L
CHEMICAL GROUP	Carboxamides
GROUPING	7
FUNGICIDE MODE OF ACTION	Succinate Dehydrogenase Inhibitor (SDHI)
APPLICATION RATE	40 – 80 mL/100 kg seed
DILUTION RATE	Apply in a total volume of 400 – 600 mL/100 kg seed



Raxil T

PRODUCT TYPE	Fungicide and Grain Protectant
ACTIVE INGREDIENT(S)	25 g/L tebuconazole or 25 g/kg tebuconazole 4 g/L triflumuron or 4 g/kg triflumuron
FORMULATION TYPE	Powder for dry seed treatment and flowable concentrate for seed treatment
PACK SIZE(S)	10 L, 100 L, 10 kg
CHEMICAL GROUP	Triazole, benzoylurea
GROUPING	3, 15
FUNGICIDE MODE OF ACTION	Inhibitor of sterol biosynthesis
APPLICATION RATE	100 mL/100 kg or 100 g/100 kg
DILUTION RATE	Apply in a total volume of 400 – 600 mL/100 kg seed. Apply powder neat.

- Gives excellent control of a range of seed and soil borne diseases in wheat, barley and oats.
- For control of bunt, flag smut (seed and soil borne) and loose smut of wheat. For control of covered and loose smut of barley. For control of covered and loose smut of oats.
- Full spectrum smut protection.
- Treated seed is also protected against insect pests of stored grain.

PRODUCT PROFILES

- A specially formulated combination of Raxil® and Gaucho® designed for wheat and oats.
- For control of aphid feeding damage and prevention of spread of barley yellow dwarf virus in cereal crops.
- For control of bunt, flag smut (seed and soil borne) and loose smut of wheat. For control of covered and loose smut of barley. For control of covered and loose smut of oats.
- Goes beyond standard fungicide seed treatment by providing protection from post-emergence insect damage.
- Protects stored seed from insect pests.



PRODUCT TYPE	Fungicide and Insecticide
ACTIVE INGREDIENT(S)	180 g/L imidacloprid 6.25 g/L tebuconazole
FORMULATION TYPE	Flowable concentrate for seed treatment
PACK SIZE	20 L
CHEMICAL GROUP	Neonicotinoid, triazole
GROUPING	4A, 3
MODE OF ACTION	Fungicide: Inhibitor of sterol biosynthesis Insecticide: Nicotinic acetylcholine receptor agonist
APPLICATION RATE	400 mL/100 kg
DILUTION RATE	Do not make total volume more than 600 mL/100 kg



- For the extended control of a range of foliar and head diseases in wheat and barley, plus the suppression of take-all and septoria tritici blotch in wheat and blackleg in canola.
- Provides broad spectrum systemic disease protection on the seed, on foliage, and on plant roots.
- The proven winner against fungal diseases in wheat, barley and canola.
- User-friendly formulation that's easy to apply and has excellent seed coverage.

PRODUCT TYPE	Fungicide
ACTIVE INGREDIENT(S)	167 g/L fluquinconazole
FORMULATION TYPE	Flowable concentrate for seed treatment
PACK SIZE(S)	10 L, 100 L
CHEMICAL GROUP	Triazole
GROUPING	3
MODE OF ACTION	Inhibitor of sterol biosynthesis
APPLICATION RATE	Wheat 300 or 450 mL/100 kg, Barley 300 mL/100 kg + 100 mL/100 kg Raxil T, Canola 2 L/100 kg
DILUTION RATE	Wheat/Barley – Do not make total volume more than 600 mL/100 kg Canola – Do not add water for canola

PRODUCT PROFILES

- For the control of aphids in faba beans, field peas, canola and lentils, and redlegged earth mite and blue oat mite in canola and lupins.
- For control of feeding damage caused by wheat aphid and corn aphid and prevention of spread of barley yellow dwarf virus in cereal crops.
- With the possible benefit of Stress Shield™ protection to give your crop the best start possible.
- Registered in both cereals AND legumes.
- Gaucho 600 is designed specifically for on-farm and seed grader use.
- Protects stored seed from insect pests.



PRODUCT TYPE	Insecticide
ACTIVE INGREDIENT(S)	600 g/L imidacloprid
FORMULATION TYPE	Flowable concentrate for seed treatment
PACK SIZE	10 L
CHEMICAL GROUP	Neonicotinoid
GROUPING	4A
MODE OF ACTION	Nicotinic acetylcholine receptor agonist
APPLICATION RATE	Cereals 120 – 240 mL/100 kg, Lupins 300 mL/100 kg, Faba beans 120 mL/100 kg, Field peas 60 mL/100 kg, Lentils 240 mL/100 kg, Canola 400 mL/100 kg
DILUTION RATE	Apply in a total volume of 400 – 600 mL/100 kg seed



PRODUCT TYPE	Fungicide and Grain Protectant
ACTIVE INGREDIENT(S)	150 g/L triadimenol 4 g/L triflumuron
FORMULATION TYPE	Flowable concentrate for seed treatment
PACK SIZE(S)	10 L, 100 L
CHEMICAL GROUP	Triazole, benzoylurea
GROUPING	3, 15
MODE OF ACTION	Inhibitor of sterol biosynthesis
APPLICATION RATE	100 mL/100 kg [#]
DILUTION RATE	Apply in a total volume of 400 – 600 mL/100 kg seed

- Get wheat, barley and oats off to a strong start with high-powered disease protection.
- For control of bunt, flag smut (seed and soil-borne) and loose smut of wheat and suppression of seedling stripe rust and speckled leaf blotch. For control of covered smut, loose smut and powdery mildew of barley and suppression of leaf scald. For control of loose and covered smut of oats.*
- Proven yield benefits through effective foliar disease control.
- Treated seed is also protected against insect pests of stored grain.

* Not all diseases are registered in Queensland.

[#] Can also be used at 150 mL rate where foliar disease is more frequently occurring.

PRODUCT PROFILES

- A specially formulated combination of Baytan® and Gaucho® designed for barley.
- For control of aphid feeding damage and prevention of spread of barley yellow dwarf virus in cereal crops.
- For control of bunt, flag smut (soil and seed borne) and loose smut of wheat and suppression of seedling stripe rust and septoria tritici blotch.
- For control of covered smut, loose smut and powdery mildew of barley and suppression of leaf scald.
- For control of loose and covered smut of oats*.
- A fungicidal and insecticidal seed treatment that provides protection to each individual plant seedling.
- Healthier crops and better yields are guaranteed, resulting in increased profits.
- Protects stored seed from insect pests.



*Not registered for use in Queensland.

PRODUCT TYPE	Fungicide and Insecticide
ACTIVE INGREDIENT(S)	180 g/L imidacloprid 56 g/L triadimenol
FORMULATION TYPE	Flowable concentrate for seed treatment
PACK SIZE	20 L
CHEMICAL GROUP	Neonicotinoid, triazole
GROUPING	4A , 3
MODE OF ACTION	Fungicide: Inhibitor of sterol biosynthesis Insecticide: Nicotinic acetylcholine receptor agonist
APPLICATION RATE	400 mL/100 kg
DILUTION RATE	Do not make total volume more than 600 mL/100 kg

DISEASE INFORMATION

RHIZOCTONIA ROOT ROT

Rhizoctonia solani



Fungal root disease

SYMPTOMS

Roots trimmed by the fungus cause bare patches, weak spots and uneven crop growth as the plant is unable to access sufficient nutrients and water. Patches can vary in size up to several metres in diameter with defined edges in the growing crop. Surviving plants within patches can be severely underdeveloped, stunted and lacking vigour and biomass. Roots may appear thin due to rotting in the early stages however they often eventually become spear-tipped and shortened. Affected plants remain stunted until maturity or die prematurely.

REASONS TO TREAT

- Bare patches, weak spots in the crop and uneven growth reduce crop yields and grain quality.
- Rhizoctonia root rot disease can build up in the soil, particularly where heavy cereal and pasture rotations are used.

TAKE-ALL (HAY-DIE)

Gaeumannomyces graminis



Fungal root disease

SYMPTOMS

- Take-all can show up in winter or early spring as stunted, yellowing plants. It is often most obvious however, after hot, dry weather at heading when whiteheads appear in patches.
- The paddock symptoms are harder to see in barley than wheat, despite the disease being present.
- The primary roots should be checked for black lesions. After a damp spring the subcrown internodes, crown roots and tiller bases may also be blackened.

REASONS TO TREAT

- Take-all can cause very serious yield losses in wheat. If patches of whiteheads are seen, the loss may be from 20 to 50 per cent of the potential yield, however losses up to 20 per cent can occur in crops with no whiteheads. Although barley can become heavily infected, yield losses are generally less than in wheat.

DISEASE INFORMATION

FLAG SMUT

Urocystis agropyri

Fungal disease



SYMPTOMS

- Long, grey-black raised streaks on leaves, leaf sheaths and occasionally stems.
- The streaks break through the plant tissues to reveal a mass of powdery grey-black spores.
- Affected leaves are often twisted and split lengthways.
- Affected plants may produce numerous tillers, some of which lodge.
- If heads emerge, they produce poor grain.

REASONS TO TREAT

- Substantial reduction in yield.
- Likely downgrading and possible rejection of grain.
- Contamination of grain and soil that will cause carry-over into subsequent wheat crops.

COVERED SMUT

Tilletia laevis / *Tilletia tritici* (wheat)

Ustilago segetum var. *hordei* (barley/oats)

Fungal disease



SYMPTOMS

- Infected plants may grow more slowly than healthy ones, and stay green for longer.
- Smut balls take the place of the grain in the head.
- The smut balls often break during threshing, releasing the spores.
- Strong fishy odour (wheat).

REASONS TO TREAT

- Smutted grain is not accepted into the bulk handling system.
- Contamination can be hard to eliminate without regular seed treatment.

LOOSE SMUT

Ustilago tritici (wheat)

Ustilago nuda (barley)

Ustilago avenae (oats)

Fungal disease



SYMPTOMS

- Dark brown powdery spores in place of florets at head emergence.
- Once the spores are released (soon after head emergence), the head is gradually reduced to a bare stalk.

REASONS TO TREAT

- Loss of potential yield.
- Barley affected by loose smut may not be accepted for malting.

LEAF SCALD

Rhynchosporium secalis

Foliar disease



SYMPTOMS

- Lower leaves are usually the first affected by scald.
- The first sign of the disease is a blue/grey/green water-soaked area on the leaf.
- These lesions become bleached, with a distinctive brown margin.
- Lesions are most commonly seen on the leaf blades, but also seen on the leaf sheath and head when the level of infection is high.

REASONS TO TREAT

- Scald is potentially very damaging in barley because an infection can kill leaves prematurely, reduce seed weight and subsequently yield.
- A severe early infection can reduce the number of heads and grains per head.
- Significant yields losses can occur as can grain quality reductions.

DISEASE INFORMATION

STRIPE RUST

Puccinia striiformis

Foliar disease



Symptoms:

Leaf infection	Yellow/orange powdery pustules on the leaf surface arranged in stripes parallel to the veins of the leaf.
Head infection	Discoloured florets with evidence of yellow rust spores.

Reasons to treat:

- Leaf infection reduces green leaf area and subsequently the plant's ability to fill grain, potentially reducing yield.
- Head infection will produce shrivelled grain, increased screenings and potentially cause seed staining.

LEAF RUST

Puccinia triticina (wheat)

Foliar disease



Symptoms:

- Small circular to oval pustules only on the upper surface of the leaves, which produce light-brown spores.
- As the crop matures, the pustules will turn black.

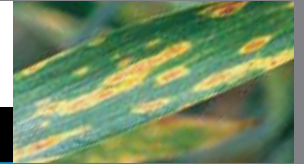
Reasons to treat:

- Leaf infection reduces green leaf area and subsequently the plant's ability to fill grain, potentially reducing yield.

SEPTORIA TRITICI BLOTCH

Mycosphaerella graminicola

Foliar disease



Symptoms:

- This disease will be seen as irregular, elongated blotches, often striped at the leaf edges.
- The lesions bear characteristic black pycnidia and are surrounded by a yellow chlorotic halo.

Reasons to treat:

- Leaf infection reduces green leaf area and subsequently the plant's ability to fill grain, potentially reducing yield.
- The damage caused by this fungus can range from nil to almost total loss of a crop.
- Intensity of the disease depends entirely on the time of onset of infection and the weather.
- Some varieties have better resistance than others.

POWDERY MILDEW

Blumeria graminis f.sp. hordei (barley)

Foliar disease



Symptoms:

- Colonies of fungal spores appear as fluffy white growth on the surface of the leaf.
- The area surrounding the spores turns yellow as the fungus depletes the leaf nutrients.
- Older infections turn grey and may develop small black fruiting bodies called cleistothecia.
- Moderate to severe infection leads to premature yellowing and eventually the death of the entire leaf.

Reasons to treat:

- Early infection in the crop, in the crop stage leading up to stem elongation, has the greatest effect on yield, as it can reduce the number of tillers.
- Infection can reduce green leaf area and subsequently the plant's ability to fill grain, potentially reducing yield.

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SEED TREATMENT APPLICATION CHART



	EverGol Prime	Raxil T	BAYTANT	Jockey Stayer	Gaucha 600	Hombre Ultra	Zorro
Active ingredient(s)	Penflufen 240 g/L	Tebuconazole 25 g/L, triflumuron 4 g/L	Triadimenol 150 g/L, triflumuron 4 g/L	Fluquinconazole 167 g/L	Imidacloprid 600 g/L	Tebuconazole 12.5 g/L, imidacloprid 360 g/L	Triadimenol 56 g/L, imidacloprid 180 g/L
Application rate (mL/100 kg seed)	40-80 mL	100 mL	100 or 150 mL	300 or 450 mL (wheat), 300 mL (barley), 2,000 mL (canola)	120 or 240 mL (cereals), 400 mL (canola)	200 mL	400 mL
Fungicidal Action							
Wheat							
Covered smut (Bunt)							
Flag smut	a						
Loose smut							
Stripe rust			Suppression*	b			Suppression*
Leaf rust				c			
Septoria tritici blotch			Suppression*	Suppression*			Suppression*
Take-all				Suppression**			
Rhizoctonia	Suppression*						
Barley							
Covered smut				d			
Loose smut				d			
Powdery mildew			Suppression*	d, e			Suppression*
Barley leaf scald			Suppression*	d, f			Suppression*
Rhizoctonia	Suppression*						
Oats							
Covered smut							
Loose smut							
Canola							
Blackleg				Suppression*			
Insecticidal Action							
Wheat aphid ¹							
Corn aphid ¹							
Barley yellow dwarf virus ²							
Stored grain insect pests ³							
Blue oat mite ⁴							
Redlegged earth mite ⁴							

Notes:
 * Suppression in seedlings.
 ** Take-all suppression at 450 mL/100 kg seed rate only.
 a. Control of seed-borne flag smut, suppression of soil borne flag smut.
 b. Stripe rust is controlled for up to 6 weeks after sowing, with good suppression thereafter at 450 mL/100 kg seed.
 c. Leaf rust is controlled up to 4 weeks after sowing, with good suppression thereafter at 450 mL/100 kg seed.
 d. 300 mL Jockey Stayer + 100 mL Raxil T per 100 kg seed.
 e. Powdery mildew is controlled for up to 5 weeks after sowing, with good suppression thereafter.
 f. Leaf scald is controlled for up to 6 weeks after sowing, with good suppression thereafter.
 1. Control of feeding damage caused by these aphids. Use higher rate (only for Gaucha) for increased length of control and in areas of high risk.
 2. Minimise the spread of barley yellow dwarf virus.
 3. Protection from granary weevil, lesser grain borer, rice weevil, rust-red flour beetle, saw-toothed grain beetle, Indian meal moth, tropical warehouse moth.
 4. Canola only.

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Photos courtesy of Robert Park, Plant Breeding Institute, Cobbitty.
 Additional disease information from Hugh Walkwork, Cereal Leaf and Stem Diseases SARDI & CRDC 2000.