



The Guide to

# Seed Treatment

Stewardship





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**Seed Treatment**  
Stewardship

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*The Guide to Seed Treatment Stewardship is an educational tool providing guidance for those using seed treatments and treated seed. This Guide is a reference document. The guidance is intended to be flexible, and its application will differ according to the products involved and size, nature and complexity of the organisation using the guidance. The guidance is representative and not exhaustive.*

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## Seed treatments as a part of New Zealand agriculture

Seed treatments have allowed farmers to grow new, more productive crops, tailored to cope with disease, insects and weeds. Seed treatments act as a delivery mechanism for pest management products to improve the production and yield opportunities of the crop.

Seed treatments are an effective tool for combating the negative impacts of diseases, insects, nematodes and other pests at the time of planting and thereafter, therefore helping New Zealand's farmers produce higher quality crops, while minimising impact to humans, animals and the environment.

## Introduction

The objective of this seed treatment stewardship guide is to improve the management of potential chemical risks. All agricultural chemical products in New Zealand, including seed treatments, are rigorously assessed by the Environmental Protection Authority to ensure that when used in accordance with label directions, agricultural chemical products present no unacceptable risk to users, consumers or the environment.

While a rigorous regulatory scheme is essential to managing the risks presented by agricultural chemicals, regulation can only go so far. Stewardship is an essential complement to regulation that allows management processes and procedures to be efficiently put in place to best manage these products throughout their lifecycle. This includes transport, storage and disposal of the product.

Successful stewardship requires collaboration, engagement and support by all stakeholders. Where this occurs, the community can be assured that best practices are being consistently applied for safety of users, consumers and the environment – including managing any risks to pollinators.

## User and worker safety

The safety of users, farmers, contractors and other workers that might come into contact with treatment products and treated seed is a key concern.

The label instructions must be followed to manage workplace risks. Whenever workers are using or handling treatment products or treated seed, workers must ensure that they use personal protective equipment appropriate to the product and the activity.

Instructions for the safe and responsible use of seed treatment products are detailed on the treatment product label. Additional information with respect to the hazards of the product can be found on the Safety Data Sheet (SDS). To ensure safety, individuals applying seed treatment must be appropriately trained and competent. Taking steps to manage risks throughout the supply chain is essential for effective stewardship. This includes ensuring that both products and treated seed are properly stored, transported and managed.

### General requirements for safe handling and use:

- Follow product label instructions for applying seed treatments.
- Minimise operator and environmental exposure to seed treatments, treated seed and dust from treated seed.
- Observe any precautions prescribed on the label including:
  - The signal heading;
  - Any treatment product use or disposal restraints;
  - Any withholding periods; and
  - Any specific planting, storage or disposal restrictions.

Any specific questions regarding the appropriate use of a treatment product should be directed to the product registrant via the telephone number printed on the label.

## Environmental safety

Environmental safety involves managing treatment products and treated seeds to minimise the risk to non-target organisms. Sensitive environmental factors to be aware of include (but are not limited to) risks to pollinators, risks to water quality (including streams, lakes and rivers), and the presence of nearby flowering weeds or plants.

Appropriate management actions can improve environmental safety and minimise any risk to non-target organisms. When using treatment products to treat seed, or when conducting seeding operations, farmers should:

- Consider measures to minimise pesticide drift. Movement of pesticide particles or droplets from the target site to any non-target site can result in off-target impacts. Users



# Overview of Seed Treatment

should consider the presence of any downwind sensitive areas and seek to avoid off-site movement of dust from treated seeds during planting by planning for wind speed and direction.

- Consider the presence of any nearby managed bee hives, flowering crops or flowering weeds and avoid contaminating them with dust from planting operations.
- Consider nearby waterways and plan planting operations to avoid contaminating them with dust from planting. Disposed rinse water must not contaminate rivers, streams or other water sources.
- Consider measures to minimise seed dust drift. Measures should include:
  - o Using high quality seed free from excessive dust.
  - o Using an appropriate coating system that keeps abrasion of the coating system to a minimum.
  - o Avoiding the release of dust from seed treatments to the air.
  - o Avoiding the off-site movement of dust during planting by considering wind speed and direction.

Other requirements specified in this guide are also important for the responsible and sustainable environmental management of treatment products and treated seed. For example: requirements for safe disposal of treated seed, empty containers and unwanted treatment products. Users should consider all actions necessary to manage risks to the environment at each stage of the treatment supply chain.

## The importance of pollinators

Around the world, bees are under pressure. Along with other pollinators, bees are essential to producing crops from flowering plants. Farmers rely on pollination services from both wild bees and domesticated honey bees. Global increases in the demand for food mean that bees are being called upon to pollinate ever more crops. At the same time, environmental pressures, parasites, viruses and other toxins continue to place increasing stress on bees.

The chemicals used in some seed treatment products, like all insecticides, present risks to bees. To minimise this potential risk it is important to ensure that at each stage of the seed treatment process, appropriate measures are put in place.

Insecticidal seed treatments can offer some benefits over traditional sprayed pesticides. Their systemic nature means that they can better target specific plant pests while not affecting predatory insect species and other beneficial insects like bees.

This guide outlines measures to reduce the risk to pollinators that may be exposed to dust generated during planting of insecticide treated seed.

## Definition of seed treatment

*Seed treatment is the application of biological organisms and chemical ingredients to seed to suppress, control, or repel plant pathogens, insects, or other pests that attack seeds, seedlings or plants. Seed applied technologies such as inoculants, herbicide safeners, micronutrients, plant growth regulators, seed coatings, colorants etc. may also be applied to the seed. Treated seed is intended for planting only and not for food or feed uses.*



## Safe use of seed treatment products, and safe handling and transport of treated seeds

Instructions and requirements for the safe use of seed treatment products are detailed on the treatment product label. Safe handling and transport of treated seed is described on seed tags for the packaged, treated seed.

Proper training is required for individuals applying seed treatments and is recommended for individuals handling and transporting treated seed.

### Safe handling and use of seed treatments and treated seed

Follow product label instructions for applying seed treatments and instructions found on the treated seed tag.

Minimise exposure to seed treatments, treated seed, and dust from treated seed.

For your own safety and to protect the environment, the following precautions should be observed:

- Signal words (e.g. Caution).
- Seed treatment product use and disposal restrictions.
- Treated seed withholding periods.
- Specific seed planting, storage, and disposal restrictions and recommendations.
- In the event of specific product questions or emergency, contact the manufacturer.

### Treating seed

- Read, understand and follow product label instructions.
- Use available engineering and system controls to minimise exposure to the seed treatment product and to ensure accuracy of application.
- Maintain and calibrate application equipment.
- Use specified Personal Protective Equipment (PPE).
- Ensure workers are adequately trained.

### Transporting treated seed

- Follow any safety precautions indicated on the seed tag. Avoid mechanical damage to treated seed and packaging.
- Ensure that no seeds are spilled during transit.

- Protect seed from heat and moisture.
- Be aware of storage requirements and limitations.
- Take precautions to avoid spillage when handling.
  - In case of spills, collect the treated seed immediately or cover or bury a small amount.
  - Properly dispose of spillage to prevent exposure to humans, animals, or the environment.

## Handling treated seed

- Thoroughly read and follow seed tag instructions. Ensure that all seed tag requirements are met.
- Use specified PPE.
- Avoid exposure to dust when opening and/or emptying treated seed packaging.
- Ensure handlers are adequately trained.
- Properly dispose of any spillage to prevent exposure to humans, animals, or the environment.

## Personal protective equipment

- When selecting personal protective equipment (PPE), always read and follow product label and/or seed tag instructions.
- PPE may include long pants, long sleeved shirt/overalls, chemical resistant gloves, shoes and socks, etc.
- Additional PPE may be required for operating equipment. Refer to PPE indicated by the equipment manufacturer.
- Additional PPE may include foot, ear, respirator and head protection.



## Environmental stewardship

Environmental stewardship involves managing treated seeds after they leave the seed treatment plant, to minimise the risk of exposure to non-target organisms. This includes educating users about the importance of protecting the environment. It is essential to educate those who handle, transport and plant the seed to help minimise the potential for adverse effects to others and the environment. Sensitive environmental factors to be aware of include, but are not limited to, pollinators, pollinator hive locations, flowering habitats including weeds and other plants at field edges, aquatic habitats (e.g. streams, ponds, rivers), wind direction, etc.

### Storage of seed treatment components and treated seed

The storage facility must:

- Have sufficient lighting and ventilation.
- Meet all applicable regulatory requirements.
- Keep seed and components dry and secure, out of reach of children, animals, and unauthorised persons.
- Shield seed and components from sunlight and extreme temperatures.

Check local council regulations for specific rules regarding storage facility requirements.

### Handling and transport of treated seed

- Ensure that the correct seed tag is attached to treated seed containers/packaging.
- Avoid undue abrasion and other mechanical damage to treated seed.
- Protect treated seed from heat and moisture. Shield seed and components from sunlight and extreme temperatures.
- Take precautions to avoid spillage.

### Planter equipment

- On vacuum or positive air pressure planters direct air exhaust downward towards the soil surface, where possible.
- Always plant at the recommended sowing/planting rate.
- Calibrate planting equipment properly.
- Always clean and maintain equipment properly.

### Dust reduction

- Consider environmental factors, such as wind speed and direction, when opening seed containers, and during filling or emptying of the drill/planter.
- Where they exist, follow planter manufacturer recommendations for use of seed flow lubricants (such as talc or graphite), and avoid excessive use.
- Avoid shaking the bottom of the treated seed bag when filling planter. This reduces the release of dust that might have accumulated during transport.

### Planting equipment loading

- The planter should be filled at least 10 metres inside the field to be planted, avoiding proximity to apiaries, hedges, flowering crops or weeds.
- When opening seed bags or when filling and emptying the drill/planter, position your back to the wind and avoid breathing released dust.

### Planting depth

- Follow planting depth instructions, if found on the seed tag, to protect birds, mammals and the environment.
- Cover all treated seeds in the field by incorporating into the soil at proper planting depth, in particular at row ends and field corners.

### Disposal of empty treated seed containers

- Dispose of seed packaging and/or containers in accordance with local requirements and container return policies.

### Disposal of unused treated seed

- Small amounts of leftover treated seed may be double planted within a portion of the field at an agronomically acceptable seeding rate.
- Return leftover treated seed to its original seed lot containers, if treated seed is intended for storage and use at a later date.
- If the treated seed no longer has acceptable germination or has been damaged, possible disposal options include incineration by a waste management facility.

### **Spills of treated seed**

Any spilled treated seed should be securely covered or collected as soon as possible to prevent exposure to humans, animals or the environment.

Follow directions on treated seed label and/or seed tag.

Once treated seed is collected, choose an appropriate disposal option. See 'Disposal of unused treated seeds' in Section Seven for disposal options.

### **Disposal of rinse water from seed treatment equipment**

Do not discharge rinse water to ground, water ways, surface water or septic systems..

Minimise rinse water – only wash out equipment when necessary.

Reuse rinse water if possible to dilute the next batch of formulation. Be aware of the potential for cross contamination if the new formulation contains different active ingredients. Factor in the potential for increased concentration of active ingredient, if significant amounts of rinse water are used.

### **Emergency planning**

Have an emergency preparedness plan for unintended exposures, spills, or accidents.

Have any relevant emergency contact information easily accessible.

In the event of emergency, call the manufacturer's product emergency number.

### **Off-target exposure**

Environmental factors to be considered when using treated seed include drift, pollinators, waterways, spills and planting depth.

### **Drift**

Drift is the physical movement of pesticide droplets or particles through the air, from the target site to any non-target site, which could result in off target exposure.

Avoid off-site movement of dust from treated seeds during planting by planning for wind speed and direction.

Always use high quality seed, free from excessive dust.

For seed types that require pesticides to be coated onto the seed, use an appropriate coating system that keeps abrasion of the pesticide coating to a minimum.

Avoid releasing dust from seed treatments into the air. When opening seed containers and during filling, emptying, or cleaning of the planting equipment, avoid dust exposure.

To protect birds and mammals, cover all treated seeds in the field by incorporating into the soil at proper planting depth, in particular at row ends and field corners.

Avoid off-site movement of dust from treated seeds during planting. Be aware of wind speed and direction.

### **Pollinators**

Consider the presence of managed honeybee hives and flowering crops or weeds in or adjacent to the field which could attract pollinators.

Consider the presence of flowering crops in or adjacent to the field which could attract pollinators. Take appropriate precautions to avoid contaminating them with dust from planting of treated seed.

### Selection of treatment product

The selection of the seed treatment products, coating materials, micronutrients and other additives is the key factor in performance, health, safety and environmental impacts of seed treatment. Selection of products and combinations should be based on evaluation of significant data demonstrating their suitability for use as a seed treatment and on the application process to be used.

#### **Manufacturer recommendations**

Manufacturers of seed treatment products, colorants, polymers and other seed treatment/coating additives should be consulted for proper use and application of their products.

Only reputable suppliers should be used.

Manufacturers should provide to seed treatment facilities information to support the effectiveness of their products, including data on efficacy, seed safety, flowability, plantability, dust levels of treated seed, and temperature limitations/requirements for the treating process.

At a minimum, treatment uniformity should be demonstrated with visual assessment of treated seed samples.

#### **Efficacy**

Consult product labels for pests controlled and rates required. Use products suitable for the pests of concern.

Use recommended rates to control pests of concern as defined on the label.

#### **Seed safety**

Seed germination may be affected by seed applied technology and must be verified prior to using a specific product or combination of products.

Verification of seed safety should include the determination of germination of treated seed over a period of time equivalent to commercial storage of treated seed.

#### **Treating process recommendations**

Selection and application of suitable treating/coating technology is very important. A suitable polymer will minimise dust off and therefore reduce risks of drift which could harm bees and other beneficial insects.

The application process must achieve accurate and uniform coverage of the seed.

Follow recommendations of suppliers or other experts.

Use the appropriate slurry volume for the environment conditions at the time of seed treatment.

Do not treat seed when the environmental or seed temperature is below recommended limitations.

Keep accurate records of all seed treatment applications.

### **Ready-to-use products versus mixtures**

Ready-to-use products are designed to treat seed effectively without using additional components other than water.

Manufacturers should provide data to demonstrate the performance of these ready-to-use formulations.

If other components are added to a ready-to-use product, the compatibility of the combination should be verified.

'Mixtures' include seed treatment products, coating materials, micronutrients, and other additives. The specific combination must be evaluated and verified to be suitable. Physical and seed safety compatibility of mixtures should be verified.

### **Overtreatment**

Overtreatment is the application of seed applied technology to previously treated seed. Such applications may be in addition to a base commercial treatment to provide protection against pests of concern in the local environment.

In some cases, previously treated seed may be overtreated with other seed applied technology.

The suitability of such overtreatments should be verified, including seed safety and dust levels.

### **Label directions for use and restrictions**

Comply with all product label requirements.

When working with multiple registered products, comply with the most restrictive label requirements of the individual components.

## Export considerations

Different countries have different rules for importing treated seed. Check regulations for the country the seeds are being imported to.

Provide accurate documentation of any seed treatments applied to seeds for export.

## Assessment of TREATING properties

Prior to use in a commercial process, the seed applied technology should be assessed in a small-scale process for treating properties including:

- Uniformity of treatment.
- Build-up of treatment material or any other adverse effects on application equipment.

Alternatively, the treatment may be suitable if it has been used successfully in another similar operation.

## Assessment of TREATED seed properties

Treated seed should be evaluated for suitability in the following parameters:

- Uniformity of treatment coverage of individual seeds (visual evaluation is acceptable).
- Presence and amount of treated seed dust.
- Field application rate of seed treatment.
- Any other known pertinent qualities.

## Application of seed applied technology

Application of seed applied technology (SAT) can include fungicides, insecticides, nematicides, plant health products, inoculants, micronutrients, herbicide safeners, plant growth regulators and other biologically functional materials to commercial seed. Compositions of SAT may include other materials such as colorants, polymers, drying agents, water and other additives (e.g. coating materials) to provide suitable appearance, physical properties, process performance, and other factors.

Quality of treatment is dependent on the composition of the applied material (the treating mixture), the application rate to the seed, the process conditions (seed throughput, seed temperature, product temperature, etc.), treatment procedures and the application equipment.

These quality factors must be selected, defined and monitored to ensure a safe, effective and high-quality treated seed, with properties that help ensure environmental stewardship. Quality of the seed prior to treatment (eg chipped seed, negligible organic dust) is also very important for ensuring the quality of seed treatment.

NOTE: Not all standards may apply to all processes, and some may apply only in a very limited way such as label verification or visual inspection.

Factors affecting product integrity and product control:

- Suitable SAT treating mixtures.
- Appropriate equipment in good operating condition.
- Suitable and consistent processes.
- Proper mixing of components.
- Application at correct rates.
- Use of correct materials.
- Use high quality seed.
- Purity of slurry mixture or components e.g. avoiding contamination from previously used treating mixture.
- Use of unexpired components (if applicable) or treating mixture.
- Operation of treating processes within acceptable ranges e.g. application to seed that is at the correct temperature as indicated by the process and/or treating mixture.

### Determine control points

- Receipt of seed from third party or output from seed cleaning process.
- Receipt of slurry components.
- Preparation of treating mixture.
- Application process (calibration and monitoring of application rate).
- Output from seed treating process.
- Packaging.

## Establish application processes

- Read, understand and follow all directions on labels for all components of the treating mixtures.
- Establish and use documented training procedures for seed treater employees, including mixer/loaders, seed treatment equipment operators, packagers, and fork lift operators. Include personal protective equipment and hazardous material handling, as specified on labels or safety data sheets (SDS)s, where appropriate.
- Establish understanding and/or agreements with third-party providers of seed on standards for material to be used in treating process, including needed data.
- Treater: provide appropriate seed tag contents as per the seed treatment product label requirements.
- Test seed material using appropriate methodology to establish or confirm quality of seed used in treating processes.
- Establish appropriate protocols for assessment of process inputs (seed, formulated products which include active ingredients, coating materials, etc.).
- Establish and use documented slurry preparation procedures (including composition, sequence of addition, operator and preparation date).
- Establish and follow changeover procedures when switching from one slurry to another.
- Establish and use documented procedures for handling, control, and proper disposal of leftover and unused slurry components, packaging materials, wastes, and treated seed.
- Properly calibrate equipment and be sure to adjust equipment settings for lot changes, such as when applying products on a seed unit basis e.g. rate per 80,000 seeds.
- Establish and follow treater cleanup procedure.

## Establish monitoring procedures

- Treating process verification: Verify equipment is capable of accurately and uniformly applying the chosen product to seed, with acceptable physical properties of the treated seed including, but not limited to, acceptable process performance (e.g. lack of treatment build-up, etc.), treated seed dust levels, handling properties and plantability.
- Upon receipt of materials, confirm by documentation.
- Verify application rate (options include calibration verification, mass balance of applied material and seed throughput, and analysis of treated seed).
- Periodically monitor physical properties (e.g. tackiness, visible dust off, flow) and appearance (e.g. uniformity, colour) of treated seed during the treatment process.

- Re-verify treating process if key parameters change and on a periodic basis:
  - i. Slurry composition.
  - ii. Material suppliers.
  - iii. Treating process parameters such as throughput.
  - iv. Treating application equipment.
- Verify shelf life of components where applicable and use only within approved use period.

### **Establish verification procedures**

- Confirm and establish appropriate sign-off and administrative approval of verification procedures.
- Verify procedure for quality of treated seed.
- Verify procedures for periodic auditing and assessments through a checklist and inspection.
- Verify adequate feed-back to the supplier of the material.

### **Establish corrective measures**

- If seed or slurry components do not meet specifications, review use and disposition of the material.
- If sourced material does not meet established standard, review procurement practices with supplier.
- If treated seed does not meet application rate or required physical property specifications, review use and disposition of the treated seed.
- Review application equipment maintenance and calibration.

### **Establish record keeping and documentation procedures**

- Establish that information accompanying receipt of the treatment components (e.g. shipping documentation, lot numbers, SDS for treatment components) is accessible, secure and retained, internally and/or externally.
- Maintain SDS documents for seed treatment products.
- Keep records of training.
- Establish documentation requirements and retention policy for equipment calibration, treating records, seed treatment application rate analysis reports, and related documents.
- Maintain records of equipment maintenance and calibration.

### Labelling of treated seed containers

The labelling of every container of treated seed is mandatory in New Zealand.

The wording on the seed container label (tag) varies according to the product. The exact wording required can be found on the registered label of the seed treatment product. A typical example is from an imidacloprid containing seed treatment product label:

‘Containers of treated seed must be labelled with the following:

- Seed treated with *imidacloprid* must not be used for human or animal consumption.
- Treated seed may be harmful to seed eating birds, and should be properly sown and completely covered in soil.
- Excess seed is not to be left in areas accessible to birds.
- Withholding Period: Stock must not graze cereals, forage brassicas, maize, sweet corn or pasture within 42 days of planting for grass seed oversown into grazed pasture (stitching), – 21 days.’

This statement must appear in bold print on the labels of treated seed containers.

Most manufacturers supply an appropriate number of sew-in or self adhesive tags printed with the required wording for each container of seed treatment product. These tags must be affixed to each individual container of treated seed.

# Storage of seed treatment products and treated seeds

Instructions for the proper storage of seed treatment products and treated seeds.

### Seed treatment product storage

Follow product label instructions for storage and container disposal requirements.

Pesticides should be stored in a secure facility and must be kept out of reach of children, livestock, wildlife, and unauthorised persons.

The plant should be well ventilated and equipped with adequate containment of seed treatment products in event of spills/leakage of containers.

Use New Zealand regulations for plant construction requirements and notification for emergency response purposes.

Appropriate documentation, including safety data sheets, should be readily available for all seed treatment products and/or other chemicals held in storage.

### Treated seed storage

Treated seeds should be kept in a secure storage facility with restricted access. The facility should be well ventilated/air-conditioned and protected from direct sunlight and rain/snow. The facility should have adequate lighting, ventilation, and temperature control.

Treated seed must be kept out of the reach of children, livestock, wildlife, and unauthorised persons.

## Planting of treated seed

Guidelines for planting commercially treated seed and alternatives for disposing of leftover treated seed.

### Environmental stewardship for planting

Be aware of the presence of bee hives, or crops or weeds in the flowering stage, within or adjacent to the field which could attract pollinators.

Ensure that no blooming weeds are present in the field at planting, through use of weed control.

Avoid off-site movement of dust from treated seeds during planting by observing wind speed and direction.

Follow planting depth instructions, if found on the seed tag, to protect birds, mammals and the environment.

### Use of seed-flow lubricants (if used)

Follow recommendations of planter manufacturer for use of talc or graphite.

Use proper lubricant rate to avoid buildup of unwanted residue on planter machinery and to minimise dust.

### Planting equipment

Follow manufacturer's recommendations for operation, cleaning and maintenance as found in equipment manual.

On vacuum or positive air pressure drills/planters, direct exhaust downward towards the soil surface if possible. Use of downward deflectors may decrease off-site movement of dust.

Always plant at the recommended seeding rate.

Calibrate planting equipment properly.

Avoid using the same equipment for treated seed and for harvested commodity seed or grain, if the treated seed labelling states it is not for food, feed, oil, ethanol, or other commodity grain channel uses.

### Cleaning of planting equipment

Clean planters and seed boxes away from sensitive environmental areas, especially those that are attractive to pollinators, such as field margins with flowering crops or weeds, or near hive locations.

Use a broom or workshop vacuum to minimise dust release. Do not use compressed air.

Do not discharge rinse water to ground, surface water or septic systems.

Minimise rinse water - wash out equipment only when necessary.

If possible, and will not result in an applied concentration above the label recommendation, reapply excess rinse water from the cleaning of planting equipment to a field site for which the active ingredient is registered.

### **Disposal of small quantities of pesticide-treated seed**

The best way to dispose of a small quantity of leftover seed that has been treated with a pesticide is to plant it in fallow or other non-cropped areas of the farm. Note that treated seed may be hazardous to wildlife and must be planted according to seed label and bag instructions.

Use the same practices and precautions that you would use when planting treated seed to produce a crop.

- Use an agronomically acceptable seeding rate and normal practices for that crop.
- Plant treated seed at a depth greater than 2.5 cm. If the seed is broadcast on the soil surface, incorporate it immediately. This will decrease the likelihood for bird or wildlife ingestion of the seed.
- Unless restricted by label language, you may double sow seed around the headland.
- Leftover treated seed may be double planted within a portion of the field at an agronomically acceptable seeding rate.
- Return leftover treated seed to its original seed lot containers, if treated seed is intended for storage and subsequent planting.
- If the treated seed no longer has acceptable germination or has been damaged, possible disposal options include incineration by a waste management facility.

### **Disposal of large quantities of pesticide-treated seed**

There are a variety of facilities that may be able to dispose of treated seed. However, a definitive answer on whether a municipal landfill or waste management facility will take seed treated with a particular pesticide can only be obtained by contacting the local authority.



# Acronyms/Abbreviations:

- ASTA – American Seed Trade Association
- CLA – CropLife America
- NZGSTA – New Zealand Grain and Seed Trade Association
- PPE – Personal Protective Equipment
- SAT – Seed Applied Technology
- SDS – Safety Data Sheets

Term	Definition
<b>Active ingredient</b>	An active ingredient is one that prevents, destroys, repels or mitigates a pest. Products intended only to aid in the growth of desirable plants (such as gibberellins, auxins) are also considered active ingredients. For seed treatment products, this typically includes fungicides, insecticide and nematicides but may also include bacteriocides or others.
<b>Agronomic</b>	Related to agronomy, the use of soil and plant sciences for the production of crops.
<b>Application rate</b>	The application rate of seed treatments, seed treatment products and/or seed treatment components. For liquid seed treatment products, rates are typically expressed in ml/100kg or ml/80,000 kernels on the label. In seed treating plants, units may be converted to more convenient units for the operation, such as litres per tonne of seed.
<b>Calibration</b>	The adjustment of seed treatment equipment to apply the target rate of slurry or seed treatment product and the verification thereof.
<b>Chaff</b>	Thin dry bracts or scales, especially the dry bracts enclosing mature grains of cereal grasses, primarily removed during threshing but which may be present in low levels in commercial seed. More generally, seed debris.
<b>Control points</b>	Any point in a process where an input occurs that can be monitored, where an adjustment is present that effects the quality, or where a quality parameter is measured that can be used to help ensure the quality of the process output.
<b>Diseases</b>	Diseases of seeds, seedling and plants. Most commonly these are caused by fungi or fungus like organisms (such as oomycetes e.g. pythium); but may also be bacteria or viruses. Common diseases controlled by seed treatments are bunt, smuts, Rhizoctonia and Fusarium. Seed treatments are often used to control such diseases either directly (e.g. by killing the fungus) or indirectly (such as by controlling an insect that vectors a viral disease e.g. BYDV).
<b>Drift</b>	The physical movement of pesticide droplets or particles through the air from the target site to any non-target site (which could result in off target exposure).
<b>Dust – field</b>	This refers to dust generated from the soil. Such dust may be picked up and dispersed in the air by the planting equipment during the planting process.

Term	Definition
<b>Dust – lubricant</b>	Lubricants are powdered materials that are added in the planter box to improve seed flow in the planter. This can potentially create airborne dust during planting.
<b>Dust – treated seed</b>	Fine particulate matter contained in or easily dislodged from treated seed. It consists of both the naturally occurring untreated seed dust as well as components of the seed treatment. Treated seed typically contains less dust than untreated seed.
<b>Dust – untreated seed</b>	Fine particulate matter contained in or easily dislodged from untreated seed. It primarily consists of naturally occurring components of the seed such as chaff and the seed coat but may also contain some level of dust from soil.
<b>Dust drift</b>	See Drift. Specifically, the drift of treated seed dust and lubricant dust.
<b>Efficacy</b>	The effectiveness of a pesticide product for controlling the target pest(s).
<b>Emergency preparedness plan</b>	A documented, trained and implemented plan for actions to be taken in the event of anticipatable emergencies. Examples of emergencies include earthquakes and chemical spills.
<b>Engineering and system controls</b>	Engineering and systems controls are equipment, measurement systems, and operating systems designed to allow safe and effective operation of equipment such as seed treating processes. Such equipment includes calibration devices for applying the correct rate of seed treatment product and ventilation system to reduce dusts in the seed treating operation.
<b>Exposure-occupational products</b>	The physiological exposure of people working with seed treatments through contact with the seed treatment products or treated seed. Skin contact and inhalation of dusts or mists are typically the most significant routes of exposure.
<b>Flowability</b>	See Seed flow. The lack of resistance to flow for seed and treated seed.
<b>Flowering plants</b>	A plant that produces flowers, fruit and seeds. For the purposes of this document, plants that are in bloom (i.e. when flowers are present).
<b>Handlers</b>	Refers to handlers of seed treatment products (e.g. loaders, mixers or seed treater operators) or handlers of treated seed (e.g. baggers, sewers, stackers, planter operators). Personal protective equipment may be specified for individual or groups of handlers.

Term	Definition
<b>Handling</b>	Handling includes the movement of products and treated seed, including but not limited to loading, unloading, weighing, bagging, sewing, stacking, and planter loading and operation.
<b>Hazardous components</b>	Components which present health, safety or environmental hazards.
<b>Insects</b>	Scientifically, an insect is any animal of the class Insecta, comprising small, air-breathing arthropods having the body divided into three parts (head, thorax, and abdomen), and having three pairs of legs and usually two pairs of wings. For the purpose of this document, “insect” may also mean any small arthropod, such as a spider, tick, or centipede, having a superficial, general similarity to the insects. Insects may be harmful to a crop; or beneficial to the crop or the environment. Seed treatment are used to control harmful insects.
<b>Lubricant</b>	A material added to seed to aid in Seed Flow in a planter. Such products are added when the seed is loaded into the planter, or may be metered in during planting. Lubricants are generally powders, with talc and graphite being the most common. New lubricants are under development.
<b>Manufacturer</b>	The producers of products for application as Seed Applied Technology and equipment.
<b>Mixture</b>	See Slurry.
<b>Nematodes</b>	Any of several worms of the phylum Nematoda, having unsegmented, cylindrical bodies, often narrowing at each end. Certain parasites attached the roots of crops and can cause significant plant damage ranging from negligible injury to total destruction of the plant.
<b>Non-target organisms</b>	Those organisms (normally plants, animals and aquatic organisms) that are not intended to be mitigated or controlled by a pesticide. For example, seed treatment insecticides are applied to control certain pests such as wireworms or aphids, and not intended to impact the health of honey bees or other pollinators, so honey bees would be non-target organisms.

Term	Definition
<b>Off target exposure</b>	For seed treatments, the seed is the target application location for the Seed Treatment. Anything other than this would be off target. Off target exposure therefore refers to things (such as other plants or animals) in the environment which may be contacted with the seed treatment or seed treatment dust during application or planting; or in the case of animals by ingestions of treated seeds.
<b>Overtreatment</b>	The application of seed applied technology to previously treated seed. Such applications may be in addition to a base commercial treatment to provide protection against pests of concern in the local environment.
<b>Packaging</b>	The container holding the untreated or treated seed or holding seed treatment products or other seed treatment components.
<b>Personal protective equipment (PPE)</b>	Equipment that is worn to mitigate the hazards of a process. For seed treating operations, PPE typically reduces exposure of operators to seed treatments and treated seed dust. Such PPE includes, but is not limited to, long-sleeved shirts; long pants; shoes; socks; goggles; chemical resistant gloves; and respirators.
<b>Pesticide</b>	For seed treatments, these are generally covered by definition 1, and in particular fungicides, insecticides and nematicides. 1. any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest; 2. any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.
<b>Pests of concern</b>	The specific pest(s) causing agronomic damage that are sought to be controlled.
<b>Plantability</b>	The ability of seed or treated seed to flow through planting equipment in the absence of build up on equipment to allow uniform and consistent planting of seed.
<b>Planter equipment</b>	Equipment used to plant seed, of which there are many types. Examples include box drills, mechanical meter planters, air seeds, and positive air pressure planters (with and without central commodity systems).
<b>Planting depth</b>	The depth below the seed surface where the seed is placed during sowing. The depth used can depend on the crop, moisture conditions, restrictions on treated seed tags, and other factors.
<b>Pollinators</b>	Animals that carry pollen from one seed plant to another, which aids the plants in their reproduction. Common pollinators include insects, especially bees, butterflies and birds.

Term	Definition
<b>Product label</b>	The registered seed treatment product label, as opposed to the seed tag.
<b>Product stewardship</b>	<p>The practice of making health, safety and environmental protection an integral part of the life cycle of chemicals. It is an integral component of the global chemical industry's Responsible Care® initiative and includes evaluations of risks and the development of actions to protect human health and the environment commensurate with those risks.</p> <p>Product stewardship is a shared responsibility between chemical producers, their suppliers and their customers. It requires the development of close, sustained dialogue and working relationships with suppliers, customers, and others in relevant value chains. These parties should share information up and down the value chain to ensure that chemicals are used and managed safely throughout their life-cycle. Extracted from Responsible Care's Stewardship Guidelines. <a href="http://www.icca-chem.org/ICCADocs/Product%20Stewardship%20Guidelines%20-%20Final.doc">http://www.icca-chem.org/ICCADocs/Product%20Stewardship%20Guidelines%20-%20Final.doc</a></p> <p>Scan the QR Code to get the above document on your smartphone tablet:</p> 
<b>Ready-to-use products</b>	Products which may be applied as is without further dilution to provide the required pesticides, colour and treatment retention while coating uniformly onto the seed. May also be used in combination with other seed treatment components or water.
<b>Rinse water</b>	Any water contaminated with seed treatment products or other seed treatment components, such as from washing equipment.
<b>Safety data sheets (SDS)</b>	The SDS is a detailed informational document prepared by the manufacturer or importer of a hazardous chemical. It describes the physical and chemical properties of the product, and is a tool for communicating safe handling and environmental protection requirements for chemical products. For pesticide products such as Seed Treatment Products, the information on the label takes precedence over the information on the SDS.
<b>Seed applied technology</b>	All materials applied to seed including any combination of seed treatment products, seed treatment polymers, seed treatment colorants, inoculants, micronutrients, biologicals and other seed treatment components.

Term	Definition
<b>Seed coating</b>	Seed coating is a thicker form of covering of seed and may contain fertiliser, growth promoters and or seed treatment as well as an inert carrier and a polymer outer shell. Seeds are coated for ease of handling, singulation, precision placement and the incorporation of beneficial chemicals or microbials. Coated seeds are accepted widely as a standard product for many crops. Seed is coated when growers need a precision-sown crop and the non-coated (raw) seed is too small, light or variable in size or shape to be sown accurately with existing equipment.
<b>Seed flow</b>	The uniformity and freedom of flow of seed through a system, generally through a seed conditioning or treating plant; or through a planter. Poor seed flow may be slow or inconsistent seed flow, or plugging of auger or conveyors or other handling equipment. Seed treatments may positively or negatively impact seed flow.
<b>Seed moisture</b>	The free water content of seeds, typically measured as a percentage.
<b>Seed safety</b>	The lack of negative effects on the germination of the seed including maintenance of the percent germination and lack of phytotoxic symptoms from Seed Applied Technology in comparison to an untreated control.
<b>Seed tag</b>	The tag/label attached to the container of treated seed which is printed with the wording specified on the product label.
<b>Seed treater</b>	Equipment designed to apply seed treatments to seeds. Such equipment should be designed so it can be calibrated to accurately and uniformly apply the product to seed. Numerous types of seed treaters exist.
<b>Seed treatment</b>	The application of biological organisms and chemical ingredients applied to seeds to suppress, control, or repel plant pathogens, insects, or other pests that attack seeds, seedlings or plants. Seed applied technologies such as inoculants, herbicide safeners, micronutrients, plant growth regulators, colorants, etc. may also be applied to the seed. Treated seed is intended for planting only and not for food or feed uses.
<b>Seed treatment colorants</b>	Products whose primary function is to impart coloration to seed treatments and in turn colour to treated seed. Treated seed is coloured or otherwise adulterated in appearance to allow visual identification that it is treated so as to identify is as unfit for human consumption and to identify the possibility of other hazards associated with treated seed. May contain other additives such as polymers or other dust reducing agents.

Term	Definition
<b>Seed treatment components</b>	Products and ingredients found in slurries including but not limited to seed treatment products, seed treatment colorants, seed treatment polymers, water, micronutrients, inoculants and other products.
<b>Seed treatment polymers</b>	Products added to seed treatments whose primary function is to reduce dust of treated seed and to improve retention of seed treatment active ingredients on the seed.
<b>Seed treatment product</b>	Pesticide containing seed treatment products that are ACVM registered for such use and bear an ACVM registration number. These typically include fungicides, insecticides and nematicides but may also contain other pesticide types or combinations such active ingredients. It excludes colorants, polymers, micronutrients and other products that do not contain active ingredients.
<b>Slurry</b>	The combined treating composition for application to seed. It may be as simple as a single ready-to-use product, or a combination of several seed treatment components and water.
<b>Sow</b>	To plant seed into the ground for the purpose of growing a crop.
<b>Sowing rate</b>	The amount of seed planted per unit area; typically expressed in kilograms, or number of seeds per hectare.
<b>Spills</b>	An unintended and uncontrolled release of a product (namely seed treatment products, seed treatment components or treated seeds in this document).
<b>Storage facility</b>	A building or other area where seed treatments and their components are stored prior to use.
<b>Suppliers</b>	The commercial provider of a product, which may or may not be the manufacturer and includes dealers and distributors.
<b>Systemic action</b>	Pesticides that are taken up and translocated within a plant in sufficient quantities to provide protection from the pest of interest.
<b>Transport</b>	The movement of products or treated seed from one location to another in the commercial chain normally by trucks, boat or rail. It also includes movement of product within a plant or on a farm, such as by augering, conveying, or elevating through elevators.
<b>Treated seed</b>	Seed that has been treated with a seed treatment product.



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Stewardship

## About NZGSTA

*The New Zealand Grain & Seed Trade Association (NZGSTA) exists to foster the business environment for its members. NZGSTA comprises of 80 companies who not only breed seed, but also research, produce, process and market the nation's grain and seed outputs. This involves both importing and exporting. Some NZGSTA members produce seed under contract. Others sell seed or licenses for advanced pastoral seed technologies including forages, animal-friendly fungal endophytes, pasture legumes and more.*

## About Agcarm

*Agcarm is the industry association which represents crop protection, animal health and rural supplier businesses. Agcarm members distribute and sell the majority of veterinary medicines and crop protection products in New Zealand. Agcarm members promote responsible use of products right through the product life cycle, from research to disposal.*

*Agcarm is also a positive voice for its members and lobbies for a progressive regulatory environment.*