

## Root Knot Nematode

The anti-root-knot nematode strain is the product R&D by Hebi Renyuan Biotech Devp. Co., Ltd., it is the special high tech anti-nematodes strain, selected from Bacillus, Paecilomyces lilacinus and other high-efficiency strains, supplemented by special synergists, and adopting modern microorganisms tech. It is the agricultural microbe preparations prepared by fermentation technology. This product has a good control effect on crop nematode diseases, especially soil-borne parasitic nematodes such as root knot nematodes, cyst nematodes, and stem nematodes. It is a live nematicide. The working mechanism is as following: hyphae of the effective microorganism contained in it can invade the nematode body and in the eggs for reproduction, and have a strong affinity for the nematode tubulin. Its unique hyphae penetrate the outer shell of the insect body to make the lipid layer and chitin. It disintegrates and forms invading spheres and vegetative hyphae, absorbs the contents of the nematode body, and rapidly shrinks and dehydrates the epidermis and somatic cells of the worm body, then dies and disintegrates, it also has effect on adults and eggs. This product not only effectively prevents and controls root-knot nematode diseases, also has the effect of preventing root rot, fusarium wilt, verticillium wilt, wilt and other soil-borne diseases, promoting growth and yield, improving quality, etc.

The performance is remarkable, suitable for prevention and control of root-knot nematode diseases for vegetables, fruit trees, melons, tobacco, and peanuts.



### Function & Features

1. In common practise, the majority of root-knot nematodes proof products are highly toxic, chronically toxic pesticides that pollute ground water and air. This product is a pure biological agent, environmental friendly, harmless to humans and animals, no residue, no insect resistance, and a broad control spectrum. The prevention effect is remarkable.
2. Prevent and control nematode diseases, the control effect can reach more than 70%, effectively improve the soil, restore the soil aggregate structure, and improve the soil Organic matter content, relieves soil compaction.
3. Effectively solve crop root diseases and vegetable seedling diseases caused by soil-borne diseases, and can effectively prevent later Various diseases.
4. Promote plant growth: During the reproduction process of Paecilomyces lilacinus, it can produce abundant derivatives, one of which is similar to indole acetic acid. Its most significant physiological effect is to promote the growth of plant roots and plants at low concentrations, so it is applied to plant roots, the strain can not only significantly inhibit nematode infection, but also promote the growth of plant vegetative organs, and at the same time, it can affect the germination and growth of seeds. It also has a promoter effect.

### Application method

1. When seedlings nursery: mix 1 kg of this product with nursery fertilizer, and apply it to 500-1000 kg nursery soil (or 15-20 square meters seedbed). Raise seedlings according to conventional methods.
2. To make seed fertilizer, use 2 kg of the product per Mu (China land unit, equals 666m<sup>2</sup>) as seed fertilizer, and mix it with other seed fertilizers evenly, and just sow along with the seed fertilizer.
3. When transplanting, mix 2 kg of this product per Mu with appropriate amount of fine soil and apply it in the hole before transplanting to prevent root-knot nematodes. Serious plots require Double (4~6) kilograms to apply.
4. During the growth period, if a diseased seedling identified, add 1 kg of the product with 3 to 5kg of water and soak for 12 hours to make a mother liquid. Dilute to 150-200 kg liquid, then irrigate the roots, each diseased plant can irrigate 0.15-0.3 kg.
5. During the onset period of fruit, if diseased, per Mu use 2 kg of the product dilute in water, 12 hours then irrigation.

### Notice

1. Products should be stored in a dry and ventilated place, not stacked in the open area, avoid direct sunlight and prevent rain.
2. Avoid simultaneous use with chemical fungicide & pesticides.
3. The effect is better when applied before 10 am and after 4 pm.

# Underground Pest contro agent

Underground pest control microorganism is a broad-spectrum insect pathogenic strain, It is a green insecticide made through multiple screening, mutagenesis, and compound optimization. Comparing traditional chemical pesticides with high residue, high toxicity and high resistance, it has incomparable Advantage.

**Control objects:** Coleoptera, scales such as grubs, golden needle insects, cutworms, mole crickets, etc. Underground pests of the order Pteroptera and Orthoptera.



## Function & Features

The product is a fungal biological insecticide, which is harmless to humans and livestock, can replace the application of chemical pesticide which caused agricultural field poisoning ; it is a natural parasitic enemy of pests. After contacting with pests, it secretes a variety of insect epidermal degrading enzymes, penetrates the pest's body wall and enters the body cavity, reproduces rapidly in the insect body, secretes a large amount of toxins, and destroys the body tissue of the insect. Repeating-infection, long-term effect. After the strains are fix planted in insect body, the nutrients in the pests can be utilized. It multiplies large number of spores, continue to infect other pests, strong contagious. High selectivity: This product has no impact on the beneficial insects like ladybugs, lacewings and hoverflies, etc. It effectively protects the pest's natural enemies and improves the overall field control effect.

## Application method

1. The dosage of making bio-organic fertilizer, add 2-3 kg of this product to 1 ton of organic fertilizer, and perform a second time fermentation, after 3-5 days , it can be used.
2. Sowing use: Mixing 1000 grams of the product with 10 kilograms of fine soil , or 5~10 kg wet wheat bran, mixing mix well, apply hole application together with seeds or machine trench, cover with soil.
3. After sowing, mix 5-10 kg of wet wheat bran with 1000 grams of this product per mu (China field units, equals 666m<sup>2</sup>) for hole application, or ditch application.
4. Apply 1000 grams of the preparation per mu (China field units, equals 666m<sup>2</sup>) land, dilute it with water 600-800 times, Irrigated the diseased field crops roots. Chop appropriate amount of fresh grass or cabbage, adding a small amount of wheat bran, mixing evenly with 1000g of this product, divide it into small portions and place them on the field plants in the evening under the shade of the roots, it infests underground pests.

## Notice

1. The product preparation is suitable for soil in areas with high water content or irrigation conditions. Too dry will affect the prevention and control effect.
2. The product should be stored in a dry and cool place.
3. Avoid high temperature and direct sunlight, after the application of the strain, should be timely soil covered. Should not under sun radiant directly.
4. Avoid simultaneous use with chemical fungicide.

# Anti Re-cropping agent

The product targets the main problems like imbalance of nitrogen phosphorus & potassium nutrients in the soil, which is the cause of the repeating cropping obstacles, also tackle the serious soil-borne diseases, as well as lacking of essential middle & trace elements.

Adopting the proprietary technology with strengthened strains of actinomycetes and functional raw material to be processed. The product can quickly colonize in the soil, transform the nitrogen, phosphorus, and potassium elements in the soil, of which normally crops can't directly absorb. And the product can effectively inhibit more than 30 common soil-borne diseases in the soil. It can secrete a large amount of plant growth regulators at the same time. Using this product can increase production and income, improve crop quality. To apply the product in repeating cropping can effectively reduce the obstacles. Perennial use can effectively improve the soil structure and micro-ecological environment.



## Function & Features

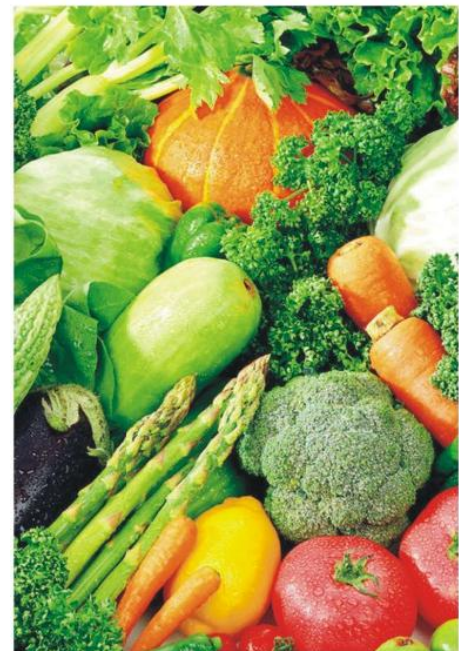
1. The strain of this product has strong colonization strength, with an average nitrogen fixation capacity of 9.3 times, and an average conversion of 30% of available phosphorus, which can effectively improve cropping crops' nutritional conditions.
2. The metabolites are rich in gibberellin, indole acetic acid, cytokinin and other plant growth stimulators, which can effectively regulate the growth of crops.
3. The product has a preventive effect on fungal and bacterial diseases and an inhibitory effect on viral diseases. Such as common blight, verticillium wilt. More than 30 kinds of diseases, black spot, frost rot, root rot, late blight and viral mosaic;
4. This product can effectively improve the soil micro-ecological environment, increase the content of soil humus, and play a role in improving soil fertility;
5. The product can significantly improve crop quality, reduce nitrite content, and promote early maturity of crops;
6. This product is rich in soluble middle and trace elements, increasing the absorption of trace elements in repeating cropping crops.

## Application method

1. Fertilization: mix with organic fertilizer, chemical fertilizer and compound fertilizer when applying base fertilizer or sowing with 1~2 kg per mu (China field units, equals 666m<sup>2</sup>). The top dressing period can also be used in the same method;
2. Fruit trees: 250g of the product strain mixing with 10kg of organic fertilizer or sawdust and straw powder, mix well then apply with individual tree;
3. Seedbed: Use 250 grams of the product per square meter of seedbed, mix it with the seedbed soil then sow.
4. If the soil condition is serious, double the quantity and the effect will be better.

## Notice

1. This product should be stored in a cool and dry place to prevent rain and sun light;
2. This product cannot be mixed with chemical fungicides at the same time;
3. It only can be formulated or mixed when fertilizer and seed dressing in execution.
4. The above methods can be used singly or in combination.





# Tobacco Roots Shield



Tobacco root shield is a broad-spectrum insect proof pathogenic strain, which has undergone multiple screening, purification,

A green compound microbial agent made of compound optimization. Compared with traditional chemical pesticides which is high-residue, high-toxicity, and high-resistance transmission, the product, has unparalleled advantages

## Function & Features

This product is a fungal biological insecticide, which is harmless to humans and livestock, can replace the application of chemical pesticide which caused agricultural field poisoning; it is a natural parasitic enemy of pests. After contacting with pests, it secretes a variety of insect epidermal degrading enzymes, penetrates the pest's body shell and enters the body cavity, reproduces rapidly in the insect body, secretes a large amount of toxins, and destroys the body tissue of the insect. Repeating-infection, long-term effect. The product can target the pest with high selecting ability. The product is harmless to beneficial insects such as ladybugs, lacewings and hoverflies, and effectively protects natural enemies, thereby improving the overall field control effect. Control objects: Coleoptera, Lepidoptera, and Orthoptera underground pests such as grubs, golden needle insects, cutworms, mole crickets, etc.

## Application method

1. Sowing use: Mixing 1000 grams of the product with 10 kilograms of fine soil, or 5~10 kg wet wheat bran, mixing mix well, apply hole application together with seeds or machine trench, cover with soil.
2. After sowing, mix 5-10 kg of wet wheat bran with 1000 grams of this product per mu (China field units, equals 666m<sup>2</sup>) for hole application, or ditch application.
3. Apply 1000 grams of the preparation per mu (China field units, equals 666m<sup>2</sup>) land, dilute it with water 600-800 times, Irrigated the diseased field crops roots. Chop appropriate amount of fresh grass or cabbage, adding a small amount of wheat bran, mixing evenly with 1000g of this product, divide it into small portions and place them on the field plants in the evening under the shade of the roots, it infests underground pests.

## Notice

1. The product preparation is suitable for soil in areas with high water content or irrigation conditions. Too dry will affect the prevention and control effect.
2. The product should be stored in a dry and cool place.
3. Avoid high temperature and direct sunlight, after the application of the strain, should be timely soil covered. Should not under sun radiant directly.
4. Avoid simultaneous use with chemical fungicide.



# Paecilomyces Lilacinus

It is a parasitic fungus in nematodes. It can parasitize in pest eggs ,and infect larvae and females, thus significantly reduce plant nematodes harm ,such as root knot nematode, cyst nematode and baseline worm of many crops.

The product does not post harm to human and livestock, and avoid field poisoning caused by application of chemical pesticides.It is harmless to beneficial insects such as ladybugs, sandflies and aphid eating flies, thus protects natural enemies in the field, enhance the overall control effect of pests.



## Function & Features

1. Controlling plant pathogenic nematodes,has an effective and broad parasitic bacterium of Southern root knot nematode and white cyst nematode eggs.The parasitic rate of eggs is as high as 60% ~ 70%.
2. Control some harmful insects, which can parasitize litchi stink bug and rice black stink bug of Hemiptera; Homoptera leafhoppers and brown planthoppers; Isoptera, Termites; Sweet potato weevil of Coleoptera and tea silk worm and lamp moth of Lepidoptera.
3. Inhibit plant pathogens, such as corn spot, wheat scab, cucumber anthracnose, cotton Fusarium Wilt and rice seedling blight.The inhibition rates of mycelial growth were 80.22%, 80.50%, 77.71%, 75.30% and 61.36% respectively; The inhibition rate of green and green mold expansion was 65.97%.
4. Promote plant growth, the strain can produce rich derivatives. One is similar indoleacetic acid products, which has the most significant physiological function .The effect is to promote the growth of plant roots and plants, the growth of plant vegetative organs and the germination of seeds at low concentration,also promote the plant growth.
5. Produce multi enzyme and Chitinase, which can promote the hatching of nematode eggs, improve the parasitic rate of Penicillium to nematodes, also can produce Cell lyase, glucanase and silk protease promote crop cell division.
6. Degradation effect, promote the decomposition of many chemical polymers (such as pesticides, tannery waste water, etc.).

## Application method

Seed dressing, in the process of crop production: Dose the product according to 1% of the seeds quantity, pile and cover for 2-3 hours and dry in the shade;  
Treatment of seedbed: mix the Paecilomyces lilacinus agent with an appropriate amount of substrate, sprinkle it into the seedbed, sow and cover the soil, and 1 kg of strain preparation can treat 30-40 m<sup>2</sup> seedbed; Treatment of seedling substrate: evenly mix 1kg strain preparation into 2-3 m<sup>3</sup> substrate and put it into seedling container; Hole application: Apply the product close to the root system squarem of seeds or seedlings, with the dosage of 0.5-1kg per mu (China field units, equals 666m<sup>2</sup>).

## Notice

1. Avoid using with chemical fertilizer, to avoid affecting the propagation speed of microorganisms in the soil.
2. It is forbidden to mix with chemical pesticides such as bactericide and insect agent to avoid microbes` death.
3. The best application time is morning or evening. Do not place the strain directly in strong sunlight.



# Trichoderma Harzianum



Trichoderma harzianum, as a Bio control Bacterium, can be used to prevent from Pythium and Rhizoctonia, Phytophthora, Fusarium, Rhizopus nigrum, columnomycetes, Sclerotinia sclerotiorum, Sclerotinia oligomeric and other pathogenic bacteria, plants disease

## Function & Features

1. Focusing on parasitic effect, After identifying the host fungi, the hyphae grow parallel and spiral along the host hyphae, produce attached cellular branches, adsorb on the host hyphae, dissolve the cell wall by secreting extracellular enzymes, penetrate the host hyphae, absorb nutrients, and then kill the pathogenic bacteria.
2. Action of antibiotics, Trichoderma harzianum can secrete some antibiotics, inhibit the growth and colonization of pathogens and reduce the harm of pathogens.
3. Plant growth regulation: can colonize in plant roots and produce compounds that stimulate plant growth and induce plant defense response, improve root micro environment, enhance plant growth and disease resistance, and improve crop yield and income.
4. It can initiate plant defense response and induce plants to produce , accumulate phenolic compounds and lignin related to disease resistance.

## Application method

- Seedbed application: 2-4 gram product per square meter, which can be applied on the seedbed after expanding the volume;
- Dip in roots: dilute 20-80 times with water, and then dip in roots or bulbs;
- Potting and seedbed soil mixing: use 110-220 grams of the strain products per cubic meter. First prepare the mother liquor according to the water consumption, and then mix it evenly;
- Root irrigation: dilute 1500-3000 times with water and irrigate 200ml for each plant. The dosage can be adjusted appropriately according to the size of the plant;
- Spray irrigation after flooding: 100-200 grams per mu (China field units, equals 666m<sup>2</sup> ) , 300 times water, spray after irrigation, water should be soaked to the root.
- Seed treatment: 60-125g strain products will be used for every 50kg of seeds. First mix half of the seeds with the strain products, and then add the remaining seeds, then the products can be stirred and mixed evenly, appropriate amount of water can be added for seed mixing to facilitate mixing.

## Notice

1. Avoid using with chemical fertilizer, to avoid affecting the propagation speed of microorganisms in the soil.
2. It is forbidden to mix with chemical pesticides such as bactericide and insect agent to avoid microbes' death.
3. The best application time is morning or evening. Do not place the strain directly in strong sunlight.





# Aphid exterminator

The active ingredient is a parasitic *Aspergillus*, identified as Endoparasitic fungi, can infestation of various crop aphids and has the characteristic of epidemic contagious, once applied in corps, can ensure whole season functional, and no need of repeating application, and non Hazardous to human, animal , product features Specific parasitic, organic, no chemical or medication residual.



## Function & Features

The process of spores of Aphid exterminator started to germination to infection , and till the fungi reproduce the spores on the aphid body. That include of 10 stages:

- 1.The spore attached on the host aphid skin;
- 2.Spore germination
- 3.Penetrated the skin;
- 4.Mycelium growth in the cavity;
- 5.Produce toxin;
- 6.The host aphid dead;
- 7.The mycelium invade all the host aphid organs;
8. The mycelium piercing the skin;
9. Produce spore;
- 10.Diffusion of more aphids groups.

## Application method

- 1.Soak the internal package in 15 Kg water, regularly 666.67 square meter (One Chinese Mu), need one to 2 packages, the actually quantity depends on the aphid harm seriousness and the corps density.
- 2.The package need to be soaked in water for 15-20 mins, can use hands to rob , help the spores being properly released, which can be judged by the solution water squeezed from the package has no color.
- 3.Best to spray in sunset time, good for spore to germination in night.
- 4.The optimum moisture is above 75%,will have the best effect.

## Notice

- 1 Prohibit to use with chemical pest cide, or Fungicide, which will cause the death of fungi.
- 2.The optimum application time is sunset, avoid stock the product under sun sight radiation.
- 3.Suggested the soaked solution directly apply on corps after soaking, should not being laied for long time, which will cause the activity of the spore.
- 4.After spraying, better keep the proper moisture of the field, can be sprayed before or after irrigation , will has the best result.
- 5.stock in cool and ventilation place。 Keep out of the reach of children

**[The package]** 30 ± 1 g/Package, 50 packages / Carton



# Metarhizium anisopliae



**【Application】** A type of insecticidal fungi that can parasitize in a variety of pests, invade pest body surface and multiply through the consumption of nutrients. By penetration, toxins are produced, and continue to spread among the pest populations, making the pest lethal.

**【Effect】** Effectively control underground pests, nursery stocks, etc., which can make the nursery seedling survival rate reach to 95%.

**【Application object】** Underground pests of crops (vegetables, fruits, tobacco, forestry, etc.)

**【Usage method】** After mixing 1 bag with 10 kg of organic fertilizer, sprinkle it on the roots of the seedlings and seal it in time. Keep the soil moist for better results.

**【Packaging specifications】** Spores  $\geq$  1 billion/g, 500g/bag.

**【Precautions】** It is forbidden to mix with chemical fungicides; store in a ventilated and cool place.





**Mixing the microbes(strain ) with oil effect,good solution.**

