
Koppert
Trianum
Your natural shield against soil-borne diseases
Partners with Nature

Who we are

To make our world more sustainable, we need ways of growing that are both safe and healthy. We believe the answers to these agricultural challenges lie in nature itself. So we partner with nature. And help our planet to find its balance. Using natural enemies to combat pests, bumblebees for pollination, microbials, and biostimulants that support, protect, and strengthen crops. Improving plant health both above and underground.

We were founded in 1967 by Jan Koppert, a Dutch grower with a clear vision; the world needed an alternative for chemical pesticides. He was the first to find a natural solution to combat the pest in his crop. Setting in motion a major transformation towards sustainable agriculture.

For over 50 years, we have been pushing agricultural innovation, and these efforts have impact. Growers worldwide use our products and knowledge to restore the natural balance in their crops.

Improving crop health, resilience, and yield. Together we are meeting the highest food safety demands on our way to our ultimate goal: 100% sustainable agriculture.

A clear goal we can't complete on our own. That's why we team up with growers, partners, universities, research stations, and governmental bodies worldwide. Together we contribute to the better health of people and the planet. So let's continue to move forward and Partner with Nature.

In control with our solutions

- **Easy to integrate in your IPM* strategy**
- **Easy to use**
- **No residue solutions**
- **Safe for the environment**
- **Effective, high-quality natural products**
- **Safe for users**
- **Prepared for future chemical bans**
- **No pre-harvest interval**

* Integrated Pest Management (IPM) is a sustainable and broad-based approach that integrates practices for the economic prevention and control of pests and diseases in crops. Natural enemies can be effective, and pesticides (chemical substances for controlling pests) are only used when alternative options do not produce the required result.

Trianum

- **Effective control of Fusarium, Pythium, Rhizoctonia, Sclerotinia and other soil-borne pathogens**
- **Improves root system development and nutrient uptake**
- **The guarantee for a good start of your growing season**
- **Suitable for many different crops, both indoor and outdoor**

Trianum

Your natural defense against soil-borne diseases

- Prevents and controls soil borne diseases
- Promotes plant growth and uniformity
- Easy and safe to use
- Trianum is available in 2 different formulations: wettable granules (Trianum-P) and micro granules (Trianum-G)
- Trianum-P can be sprayed or added to an irrigation system
- Trianum-G can be mixed with substrate or applied in furrow at sowing using a granulator

Mode of action

1. Competition for space

Trianum grows faster on the surface of the root than soil borne pathogenic fungi, which get no chance to establish themselves on the roots.

2. Competition for nutrients

Trianum takes away the nutrients that the pathogens need to feed on. They therefore have no chance to develop.

3. Parasitism of pathogens

Trianum grows around the mycelia of the pathogen. Their cell walls break down and the pathogen dies.

4. Strengthening the plant

Trianum improves the root system through the formation of more root hairs, so that water and nutrients can be absorbed better. This leads to a stronger and more uniform crop resulting in better yield and quality.

5. Induced resistance

Trianum reinforces the defence mechanism of the parts of the plant above the ground. This is called induced systemic resistance (ISR).

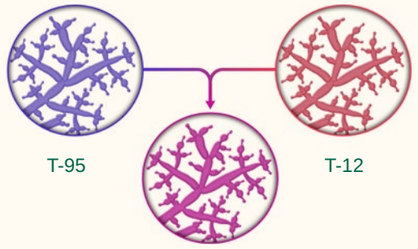
6. Absorption of fixed and non-fixed nutrients

Trianum has the capacity to make certain ‘fixed’ nutrients such as manganese and iron available for the plant to absorb.

Want to know more on how Trianum works, check out this video.

What is Trianum

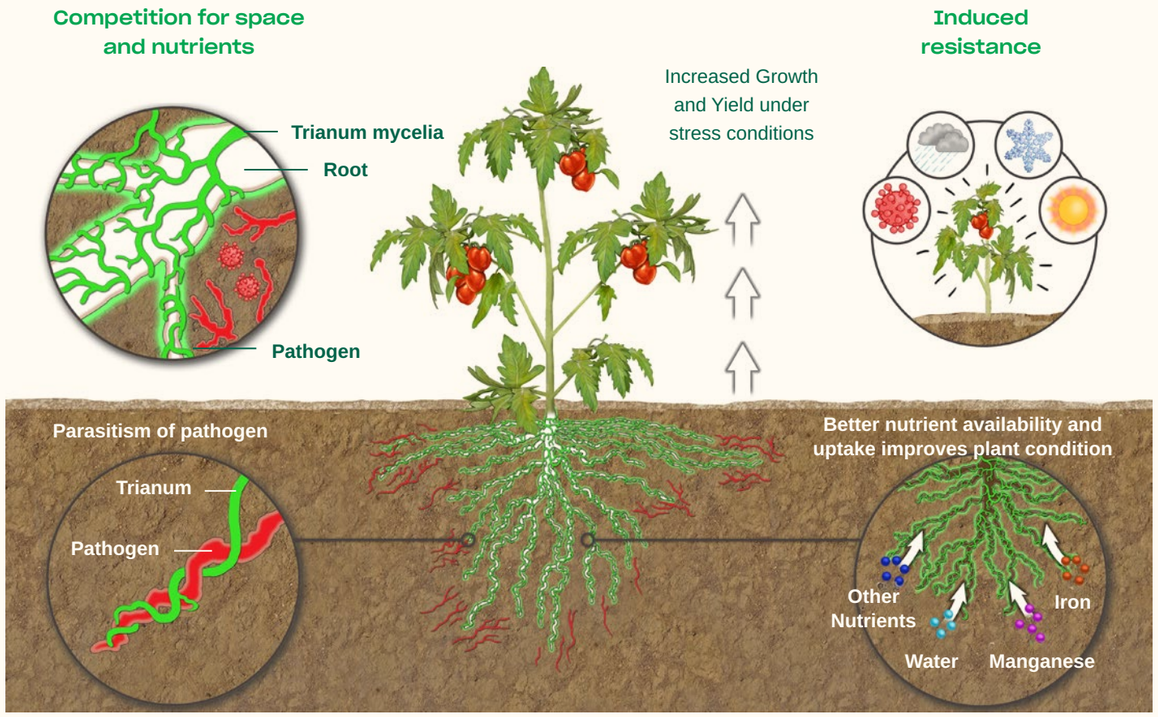
Trianum is a biofungicide based upon the unique fungus Trichoderma harzianum T-22. This bio-control solution colonizes the root system of plants and thus protects numerous indoor and outdoor crops against soil-borne diseases such as Fusarium, Pythium, Sclerotinia and Rhizoctonia. An additional benefit is that it improves root system development, nutrient uptake and plant growth.



Hybrid strain T-22

A unique hybrid strain

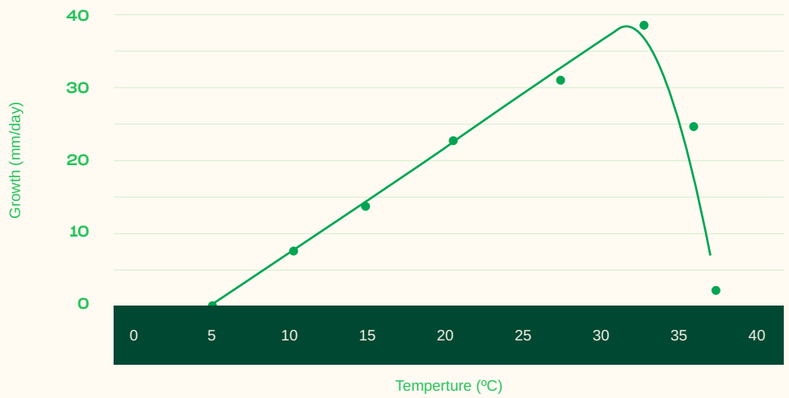
The hybrid strain T-22 of Trichoderma harzianum fungus was developed by merging two strains identified as strong biocontrol agents: T-95 and T-12. T-95 was considered a good rhizosphere competent strain isolated from a Rhizoctonia-suppressive Colombian soil, while T-12 was isolated from New York state soil and identified as more capable of competing under iron-limiting conditions. The result was a competitive root colonizer with effective disease control features in multiple soil types and climatic conditions.



Flexible solution

Trianum is a versatile solution which can be applied in many different conditions. During extensive trials we also observed that Trianum performs well in different ranges of PH (between 4 and 8,5) and in different ranges of soil salinity.

This biofungicide is able to grow and colonize root systems of plants in a wide range of temperatures, from 10ºC to 34ºC.

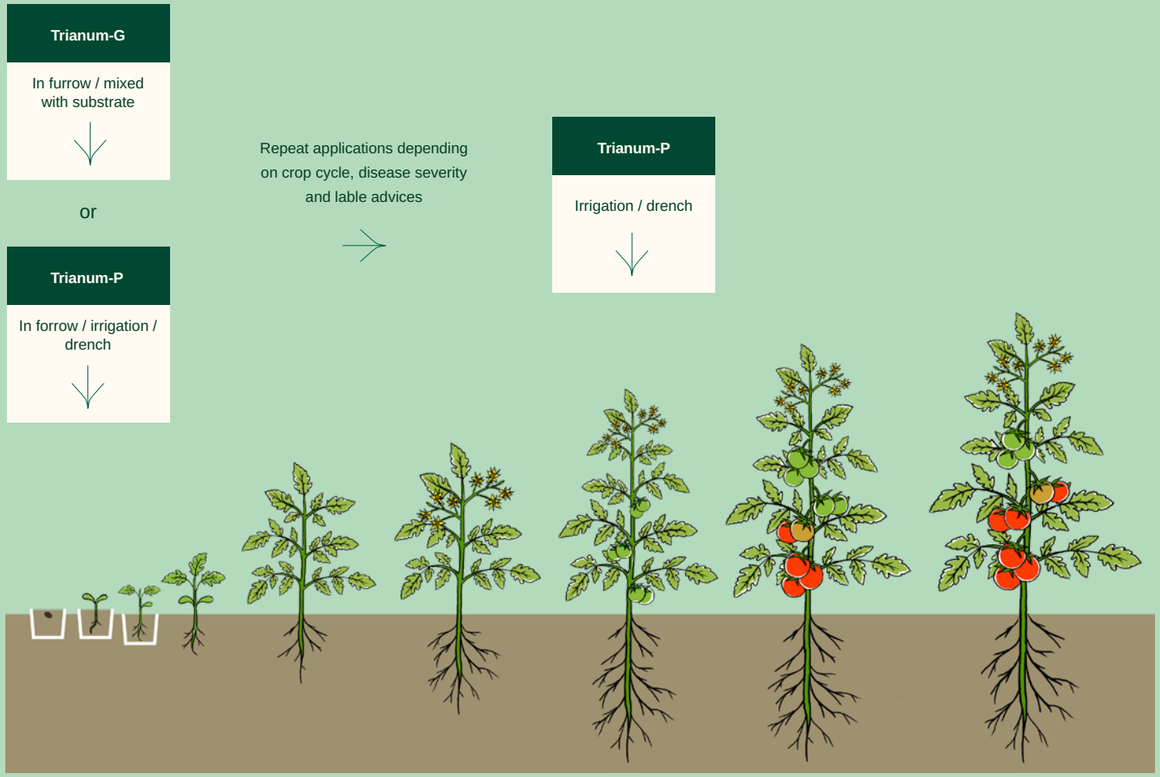


How and when to apply?

Trianum is most effective when used preventive: a good and early colonization of the root system will avoid attacks of pathogens.

Applications with Trianum-P or Trianum-G should start as early as possible, at the moment of sowing or transplanting. For transplanted crops it is possible to start applications from propagation.

When the pathogen pressure is potentially high, the crop is sensible to soil diseases. If the crop cycle is long it is advised to perform regular applications with Trianum-P to keep a high number of change to maintain a solid barrier around the roots.

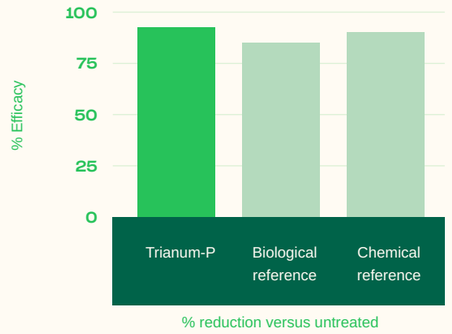


Partners with Nature

Big things start small

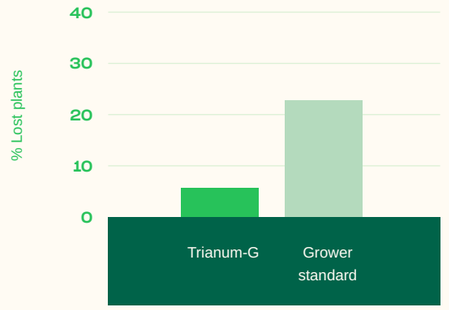
Results

Onion bulbs affected by *F. oxysporum* after storage



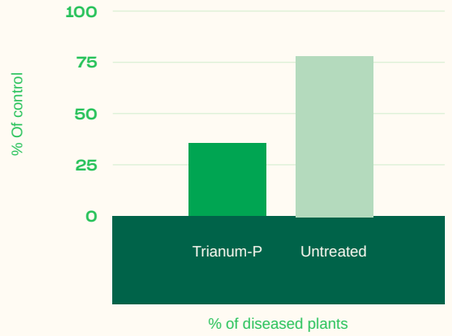
Trial performed by SynTech Research, Spain

Trianum vs. Pythium in carrots



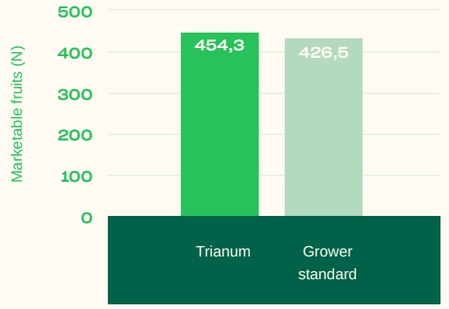
Trial performed by Koppert R&D, Poland

Trianum-P vs Fusarium - Baby leaf



Trial performed by Koppert R&D, Italy

Trianum vs soil diseases in processing tomato



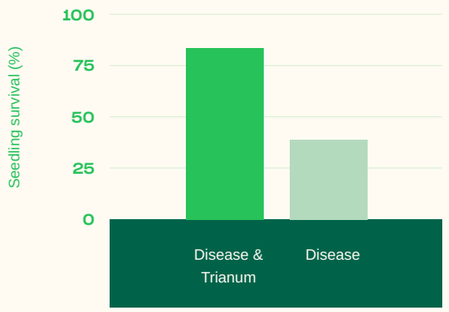
Trial performed by Koppert R&D, Italy

Harvest time

Untreated control

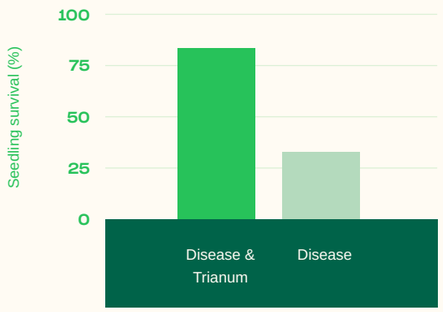
Trianum-P

Cucumber vs. *Pythium spp.*



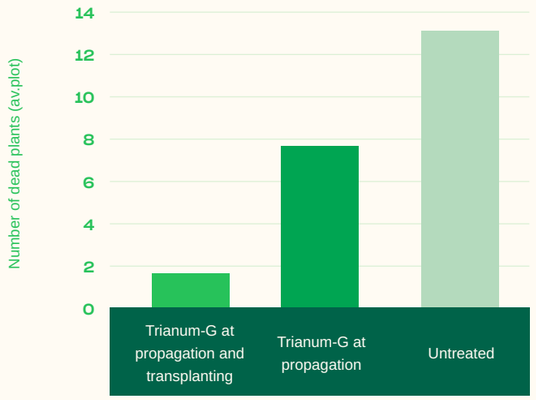
Trial performed by Koppert R&D, The Netherlands

Tomato vs. *Fusarium spp.*



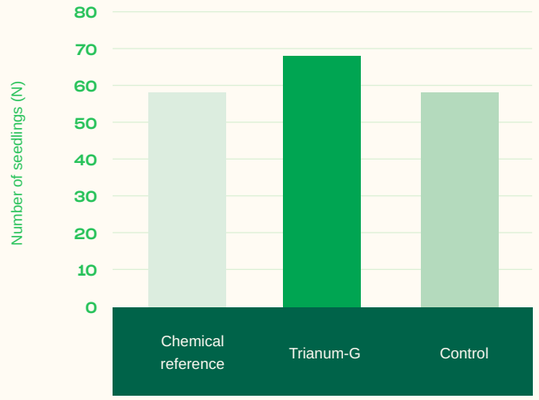
Trial performed by Koppert R&D, The Netherlands

Trianum vs. Rhizoctonia in Broccoli propagation



Trial performed by CRO Innoventis, The Netherlands

Trianum vs. *Fusarium spp.* In Pinus sylvestris (tree nursery)



Trial performed by CRO Nadlesnictwo Daleszyce, Poland

Partners with Nature

7 reasons to choose for Trianum

1. It controls different soil-borne diseases
2. It strengthens the plant and promotes growth
3. Pathogens cannot develop resistance to it
4. Reduce the use and dependence of chemical fungicides in your crop
5. It is reliable and of a consistent quality
6. Safe for people, plants and the environment
7. Easy to apply

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