

Vici Fix

Stronger roots, higher stem weights in
chrysanthemum



How living mycorrhizal spores help chrysanthemum growers cultivate
a sturdier, more resilient crop.

- ✓ 10% higher stem weights demonstrated
- ✓ A stronger, more resilient root system for a more vital crop
- ✓ Room to further reduce synthetic fertiliser input without loss of yield
- ✓ Easy to apply, liquid formulation, no extra cultivation step

Whitepaper for chrysanthemum growers and distributors | REKA | 2026

Claim policy: Vici Fix is a biostimulant, not a crop protection product. We claim that it makes the plant stronger and more resilient, not that its use leads to fewer diseases or pests.

Table of contents

The chrysanthemum grower's problem.....	3
Vici Fix: the next generation in mycorrhizal products.....	4
What sets Vici Fix apart from other mycorrhizal products.....	5
How it works in practice	6
Optimal conditions	7
What does Vici Fix do in the crop?	7
Vici Fix-specific field trials in chrysanthemum	8
Vici Fix results in the presence of nematodes	9
A more resilient plant.....	9
Vici Fix-specific field trials in chrysanthemum – 3 growers.....	10
Practical application	11
Why Vici Fix instead of a standard mycorrhizal product	11
Getting started with Vici Fix.....	12

The chrysanthemum grower's problem

Chrysanthemum is one of the most intensively grown crops in Dutch ornamental horticulture, which places heavy demands on both the soil and the crop.

Three problems keep recurring:

- ✓ **Nematodes.** Root-knot nematodes (*Meloidogyne spp.*) are among the most persistent soil pests in chrysanthemum cultivation: they attack the root system and weaken nutrient and water uptake, resulting in lower stem weights and more crop loss.
- ✓ **Soil health under pressure – Pythium and Rhizoctonia.** These root pathogens are a constant threat in intensively cultivated soil and strike as soon as the root system weakens or soil life falls out of balance.
- ✓ **Thrips pressure from overfertilisation.** High nitrate levels in the leaf make the plant more attractive to sap-sucking insects such as thrips – one of the most persistent pests in the crop.
- ✓ **Soil fatigue.** Intensive cultivation and annual soil steaming against nematodes depletes soil life, making the plant more vulnerable to stress and disease pressure.
- ✓ **Increasing pressure on synthetic fertiliser use.** Growers need to reduce input without sacrificing stem weight or quality, while the conventional approach seems to work against exactly that.

REKA's Resilient Growing System addresses this fundamentally by steering on plant sap values instead of standard fertilisation schedules, combined with the use of organic fertilisers and biostimulants.

Vici Fix is the next step in that system: it improves the plant's nutrient uptake, meaning less input is needed for the same or higher stem weights, root development is stronger, and the crop is more uniform.

What is Vici Fix?

Vici Fix is a mycorrhizal inoculant based on the fungal species *Rhizophagus irregularis* (strain MUCL 57021). Mycorrhizal fungi naturally form a symbiotic relationship with plant roots: the plant supplies carbon (sugars), and in return the fungus supplies water, phosphorus, nitrogen, iron and manganese – through a fungal network that greatly expands the plant's effective root reach.

Vici Fix: the next generation in mycorrhizal products

Mycorrhizal fungi have existed for more than 400 million years and are the most important symbiotic partner of plants in the soil. Yet the effect of commercial mycorrhizal products in practice is often inconsistent. The cause lies not in the concept, but in the way most products are manufactured.

The traditional production method is **in vivo**: the fungus is grown in a greenhouse together with a host plant, and the end product is a mixture of plant material, substrate and fungal residues. This process is labour-intensive, difficult to standardise, and results in a relatively expensive end product of variable quality.

What does a traditional mycorrhizal product actually contain?

The growing material released from an in vivo system consists of a mixture of so-called **propagules**: the umbrella term for all the forms in which the fungus can survive and spread. A propagule can be:

- **a root fragment with attached fungal thread (hyphae)**; this fragment may already be dead by the time the product is applied;
- **a living hyphal network** that is still able to colonise a new root;
- **a spore** – the most stable and reliable form, which only germinates once conditions are favourable.

A traditional product contains all these forms mixed together, in unknown and variable proportions. When applying it, you don't know in advance which part of the product will become active.

Some propagules are already dead, others have only a limited chance of colonisation, and only the spores offer a consistent starting point.

This explains why the effectiveness of traditional mycorrhizal products is so inconsistent in practice: you sow with a partly unknown composition and hope enough living material is present to see results.

Vici Fix is produced using a fundamentally different and more modern growing system: **in vitro, in controlled bioreactors**, instead of in a greenhouse with a host plant. This delivers two direct advantages over the traditional process:

- **Lower production costs**: no host plants, no substrate, no greenhouse space needed. The process is more scalable and efficient, making Vici Fix more affordable than comparable in vivo products.
- **Higher and consistent quality**: the bioreactor process produces exclusively living spores, instead of an undefined mixture of propagules.

What sets Vici Fix apart from other mycorrhizal products

- ✓ **100% pure, living spores** of a single standardised fungal species: *Rhizophagus irregularis* MUCL 57021, an arbuscular mycorrhizal fungus – instead of a blend of different propagules or species.
- ✓ **No uncertainty about what is in the product.** Because every spore has the potential to germinate and colonise, the grower knows exactly what is being applied: no dead fragments, no guesswork about what will or won't become active. This is the direct result of eliminating the propagule uncertainty inherent to in vivo production.
- ✓ **Produced in vitro** in bioreactors, instead of the conventional in vivo production process (growing in greenhouses with substrate), which delivers more consistent quality and higher spore density – and without plant pathogens
- ✓ **Liquid formulation:** easy to dose and apply, no granulate. Available in 1L and 100mL bottles
- ✓ **Density: 10 million** viable spores per litre
- ✓ **Shelf life: 6 months** when stored between 4–8°C; product availability guaranteed
- ✓ **Full transparency.** Because no blend of species or propagule types is used, REKA can state precisely what is in the product and what effect can be expected from it, instead of a generic claim based on an unknown mixture.

“Most mycorrhizal products on the market are a blend of everything – shooting with buckshot. With Vici Fix, you know exactly what’s in it and what it does.” – Pablo Ibort, R&D Manager REKA

Recommended  Vici Fix Controlled & consistent	Comparison  Traditional alternatives Variable & unpredictable
 PRODUCTION In-vitro (controlled)	 PRODUCTION In-vivo (variable)
 ACTIVE COMPONENT Colonizing spores	 ACTIVE COMPONENT Propagules (root fragments)
 CONTAMINATION No	 CONTAMINATION Likely
 STRAIN 1 highly effective strain	 STRAIN Multiple
 FORMULATION Liquid (water-based)	 FORMULATION Gel or granule
 EFFICACY Consistent	 EFFICACY Inconsistent

How it works in practice

After application, Vici Fix colonises the root system of the chrysanthemum. The fungal network expands the effective root surface area from **5 cm²** of root system to **250 cm²** of fungal hyphal network – an increase of approximately **10–100x** – allowing the plant to access a much larger soil volume (up to 5–20x) for water and nutrient uptake.

For chrysanthemum cultivation, this means in concrete terms: a plant that uses nitrogen and phosphorus more efficiently, with a stronger and deeper root system – which can result in higher stem weights.

Reducing fertilisation is optional; higher stem weights can also be achieved without a reduction.

Optimal conditions

Factor	Effect on Vici Fix
Temperature	Active between 10–35°C, optimal performance around 28°C
EC (salt content)	Active over a wide range (0–8 dS/m), optimal at low EC (AROUND 2 dS/m).
Phosphate fertilisation	Limits establishment of the symbiosis during the first 2–3 weeks AT A P VALUE ABOVE 1.5 MMOL/L
Best results with	Slow-release fertilisers, poor soils/substrates, abiotic stress or nutrient deficiency

What does Vici Fix do in the crop?

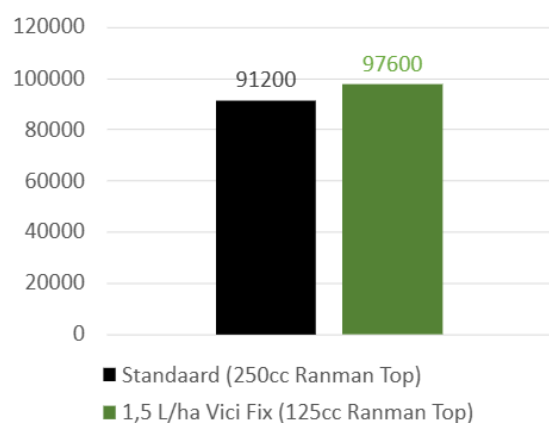
- ✓ Expands the root network (well beyond the root zone)
- ✓ Improves uptake of nutrients & water
- ✓ Improves tolerance to abiotic stress
- ✓ Reduces dependency on chemical input

Vici Fix-specific field trials in chrysanthemum

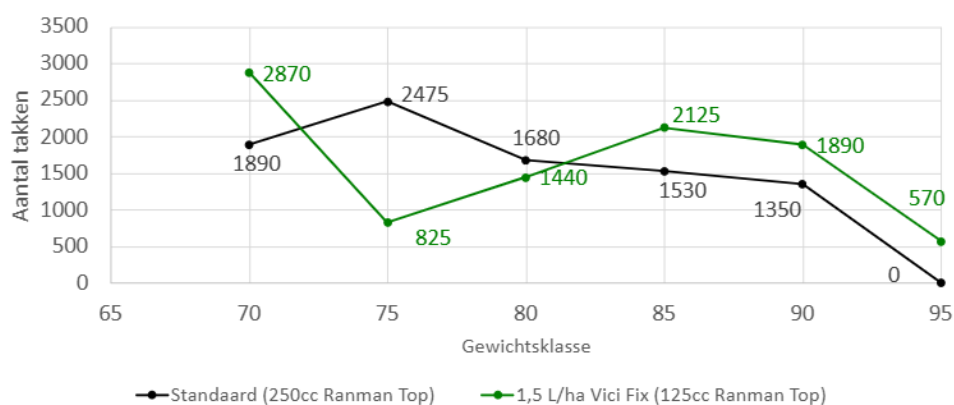
In 2026, Vici Fix was tested in two controlled field trials in chrysanthemum, with a standard-practice group as reference:

Trial	Measurement	Result
Field trial 1	Number of harvested stems	91,200 (standard practice) → 97,600 with Vici Fix (+7%)
Field trial 1	Stem weight	Heavier stems in the Vici Fix treatment (weight class distribution – source document contains the full breakdown)
Field trial 2	Average stem weight (per 5 stems)	354 g (standard practice) → 397.5 g with Vici Fix (+12%)

Trial 1 - total number of branches



Trial 1 - weight class distribution



Vici Fix results in the presence of nematodes

In field trial 1, the aim was to achieve better stem weights while reducing the Ranman Top dose, and to achieve better crop resilience against root-knot nematodes. This grower suffered heavily from root-knot nematodes.

A total of 2 treatments were carried out, with half of the bay treated with Vici Fix and the other half left untreated.

The treatments were:

- Half dose Ranman Top (125 cc/ha) and Vici Fix (1.5 L/ha)
- No Ranman Top and Vici Fix (1.5 L/ha)

The results of both trials are clear and consistent.

In summary, the results show that crops treated with Vici Fix, even at a reduced Ranman Top dose, showed stronger crop development than the untreated reference group.

Under conditions of high root-knot nematode pressure, this results in more harvested stems and a higher average stem weight. Fully discontinuing Ranman Top is not possible, however, as controlling *Pythium* and other soil-borne diseases remains necessary.

A more resilient plant

Vici Fix extends and strengthens the root network: the root system becomes larger and more vital. A more extensive and healthier root system makes the plant better able to withstand the pressure nematodes place on root function. Vici Fix also changes the profile of root exudates, which contributes to a more resilient root environment.

Scientific research describes that arbuscular mycorrhizal fungi improve the plant's nutrient uptake and can contribute to increased plant tolerance for nematode pressure (Hol & Cook, 2005; [An overview of arbuscular mycorrhizal fungi–nematode interactions - ScienceDirect](#)). This mechanism works through strengthening the plant itself, not through direct suppression of the nematode population.

Additional scientific sources

- Hol, W.H.G. & Cook, R. (2005). [An overview of arbuscular mycorrhizal fungi–nematode interactions](#). Basic and Applied Ecology. – describes increased tolerance of AMF plants to nematodes.
- Schouteden, N. et al. [Arbuscular Mycorrhizal Fungi for the Biocontrol of Plant-Parasitic Nematodes: A Review of the Mechanisms Involved](#). Frontiers in Microbiology. – mechanistic overview of increased plant resistance and tolerance through AMF colonisation; the underlying mechanism is plant strengthening, not direct control.
- Chitarra, W. et al. [Arbuscular Mycorrhizal Fungi Mitigate Crop Multi-Stresses Under Mediterranean Climate: A Systematic Review](#). Agronomy (MDPI). – broader evidence for AMF as a plant strengthener against both abiotic and biotic stress.

Vici Fix-specific field trials in chrysanthemum – 3 growers

In 2026, Vici Fix was tested in three controlled field trials in chrysanthemum at 3 different growers:

Grower / location	Trial setup	Result
GROWER 1 / Maasdijk	2 growing cycles – 4 bays: Growing cycle 1: - Bay 1: Standard (80cc Ranman Top) - Bay 2: Standard Ranman Top + 3 L/ha Vici Fix - Bay 3: Half Ranman Top + 3 L/ha Vici Fix - Bay 4: No Ranman Top + 3 L/ha Vici Fix Growing cycle 2: - Bay 1: Standard (80cc Ranman Top) - Bay 2: Standard Ranman Top + 1.5 L/ha Vici Fix - Bay 3: Half Ranman Top + 1.5 L/ha Vici Fix - Bay 4: Half Ranman Top + 1 L/ha Vici Fix	Average stem weight increase (per 25 stems): - 24% with Vici Fix applied and Ranman Top kept at standard rate. - 9% with Vici Fix applied and no Ranman Top. - 12% with Vici Fix applied and Ranman Top kept at standard rate. - 6% with Vici Fix applied and Ranman Top halved.
GROWER 2 / De Lier	Bay 2: white and yellow = treated Bay 3: white and pink = treated Bay 4: white and pink = control Bay 5: white and yellow = control Treatment is: (1.5 L/ha Vici Fix + 5 L/ha Vidi Parva + Ranman Top (0.5 L/ha) + Ortiva.	Average stem weight increase (across an average of 12,786 stems) +5%
GROWER 3 / Monster	Half the bay treated and half untreated. Vici Fix 1.5 L/ha	Average stem weight increase (per 60 stems): +10%

Practical application

Aspect	Explanation
Dosage	1.5 liter/ha
Application timing	Add at the start
Application method	Apply via irrigation / drip / drenching → Remove the filters when applying via the spray boom!
Frequency	Once at the start of cultivation, each growing cycle.
Combination with fertilisation	Works in addition to the plant-sap-driven fertilisation strategy.
Compatibility	Can be combined with Ranman Top and Ortiva CANNOT be combined with Rizolex Can be applied together with Trianum
Ease of use	Liquid, easy to dose, no adjustment to the existing cultivation routine required.

Why Vici Fix instead of a standard mycorrhizal product

	Vici Fix	Traditional alternatives
Production	In vitro (controlled) → consistent quality	In vivo (variable) → inconsistent
Active ingredient	Colonizing spores – high and rapid colonisation	Propagules (root fragments)
Contamination risk	None	Plausible
Strain	1 effective, standardised strain	Multiple strains (blend)
Formulation	Liquid (water-based)	Granulate or gel
Effectiveness	Consistent	Variable

Getting started with Vici Fix

Want to see what Vici Fix can do for your chrysanthemum cultivation? Contact our account managers for an advisory conversation or to start a trial at your business.

David van Dijk Account Manager +31 6 51202561 d.vandijk@rekasoilag.com	Lennard Kennepohl Account Manager +31 6 83 38 58 57 l.kennepohl@rekasoilag.com
---	---

REKA B.V.

www.rekasoilag.com

[LinkedIn](#)