

Beet nematodes

on the rise

Tolerant sugar beets do not show any visual damages, yield potential falls by the wayside.

Resistant catch crops can help!

On observing sugar beet cultivation in Germany it becomes clear that beet cyst nematodes (*Heterodera schachtii*) are present in all main cultivation areas. Considerable damage can be seen depending on the crop rotation and infestation density. In addition, latent infestation densities have been noticed on many fields. Though they do not yet present a serious risk, they do indicate the presence of nematodes. It is extremely important to use horticultural measures to keep infestation levels as low as possible, avoiding severe damage right from the beginning.

When does the damage start to happen?

A crucial direct measure is selecting the right sugar beet variety, since severe infestations can cause a reduction in yield of 30% or more. The commercial damage threshold for nematode-prone sugar beet varieties is 500 eggs and larvae per 100 ml of soil. For nematode-tolerant varieties this threshold is 1500 eggs and larvae per 100 ml. Various institutes provide proper soil testing. The lost yield potential is shockingly high, even in nematode-tolerant varieties. Yield reductions of 15–20% can occur without visual symptoms being visible on the tolerant beets.

Resistant catch crops can help

Despite the use of nematode-tolerant beet varieties, current trial results have shown that it is possible to significantly increase yields by cultivating nematode-resistant fodder radish varieties. The potential yield increase is at least 5–10%, which corresponds to revenue increases of about €150/ha if a premi-

um-quality catch crop such as nematode-reducing fodder radish is used. One of the reasons for this is the deep soil penetration of fodder radish roots. This controls the beet nematodes present in the deeper soil layers and considerably reduces the nematode population immediately before sugar beet cultivation. Sowing the catch crop early is absolutely essential for this to work. Moreover, fodder radish can also be sown using coated seed within existing cereal stands. This can result in a growth lead of about 4 weeks. Resistant white mustard varieties have the advantage that they can be sown even later (until the beginning of September) and exhibit good nematode reduction during the warm autumn weather.

Please note! In regions prone to stem nematode or onion bloat (*Ditylenchus dipsaci*), it is absolutely necessary to plant fodder radish because it is neutral to the pathogen. On the other hand, white mustard acts as a host and allows the pest to propagate.

How do resistant white mustard and fodder radish varieties work?

Special substances in the root exudates of resistant varieties lure the beet cyst nematode larvae, which then enter the roots. Larvae generally mature and reach the reproductive stage within the plant; resistant plants severely inhibit this process. Almost exclusively male nematodes are formed and the number of fertile female nematodes is greatly reduced. The result is a considerable reduction in the propagation of nematodes. The percentage of female nematodes depends on the variety's resistance level. In grade 2 varieties, the propagation rate drops by 70–90%; in grade 1 varieties, the reduction is more than 90%.

A good catch crop stand



Seedbed preparation: Professional seedbed preparation and a precisely drilled catch crop stand provide enormous benefits vis-à-vis seed broadcasting, especially under difficult conditions (drought etc.).

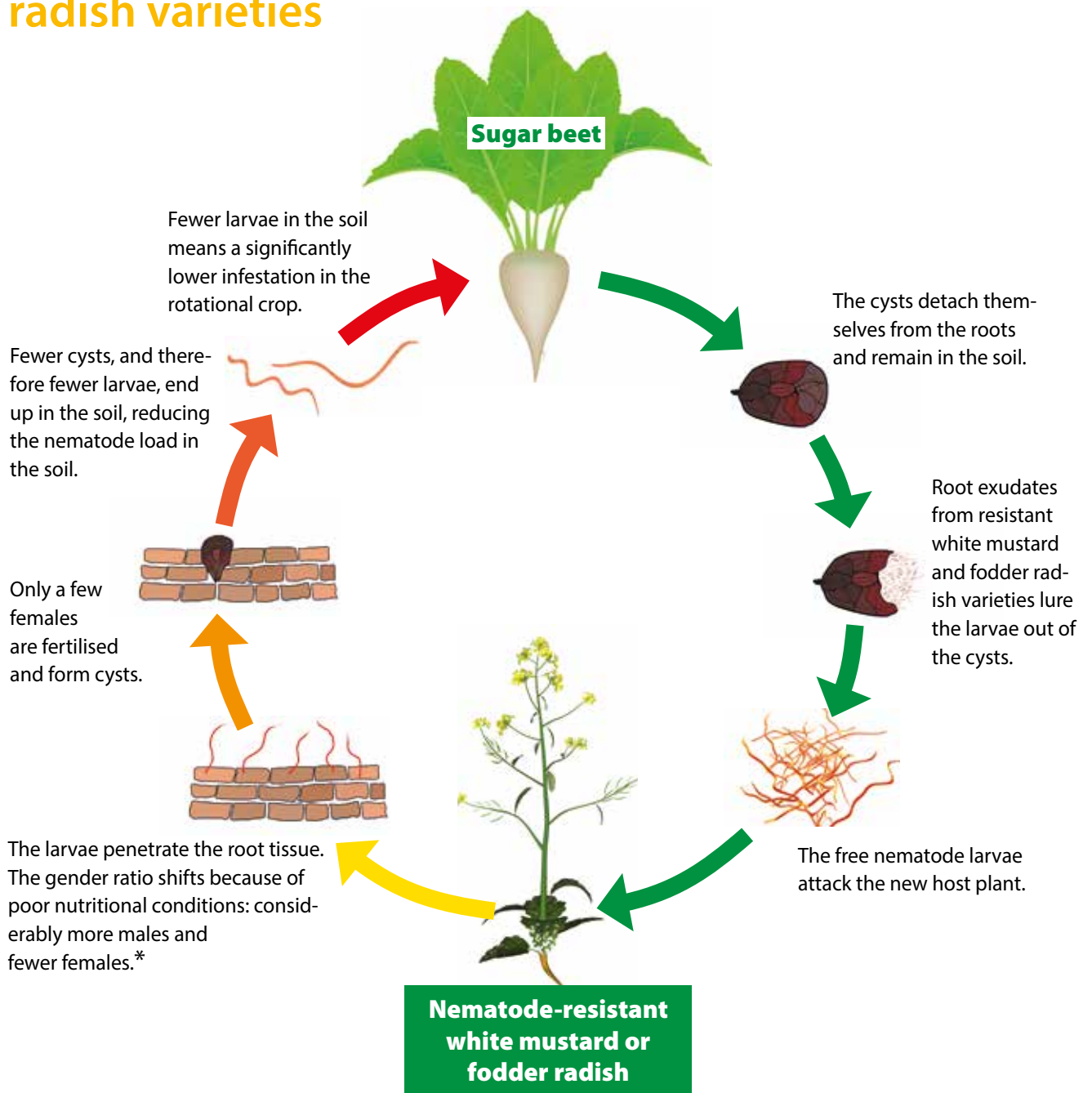
Sowing period: The fodder radish stand requires time and warmth in order to develop properly and effectively reduce nematodes. White mustard develops faster; however, even in this case, the plants require a minimum of 8–10 weeks and sufficiently high temperatures to show their full potential.

Seeding rate: The denser the plant stand, the better the root penetration in the soil and, thus, the nematode reduction. Recommended sowing rate: 25–30 kg/ha

Variety selection: Choose from the wide range of varieties. Decide what flowering and mass formation characteristics are ideal for your location and target nematode reduction by using varieties with high grades.

Reducing beet cyst nematodes

by using resistant white mustard and fodder radish varieties



* The roots of resistant white mustard and fodder radish varieties provide deficient nutritional conditions for nematode larvae. Since the female nematodes are therefore unable to form the required nutritive cell, nearly only male nematodes reach sexual maturity. As a result, only very few mature females are developed, which can form new cysts and produce offspring. This method helps to drastically reduce beet cyst nematode infestation in the soil. The reduction in the propagation rate depends on the variety used. Resistance grade 1 varieties reduce more than 90% nematodes and grade 2 varieties reduce nematodes by 70 to 90%.