

# White Tip Nematode of Rice & Their Management

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#### Abstract

Many of the plant parasitic nematodes are reported in association with rice culture in India. The potential of a few plant-parasitic nematodes as pest of rice has been investigated. Among which, the white tip nematode (*Aphelenchoides besseyi*) is widely prevalent but severe in Southern & Eastern states causing yield losses as much as 17.4 to 54.1 %. In this article, mainly the symptoms, distribution, host ranges, biology and management of this nematodes are discussed.

Keywords: Rice, Aphelenchoides besseyi, alternate host, yield loss, management.

### **Nematode Of Rice**

Plant Parasitic nematodes cause serious damage to rice crop. They have diverse parasitic habits, but mainly cause mechanical damage and/or malfunctions of the physiological processes that involved in plant development, resulting in poor growth and yield loss. About 32 species belonging to 13 genera were observed in association with the crop, among which few are economically important.

## 1. <u>WHITE-TIP NEMATODE</u> (Aphelenchoides besseyi):

- a) <u>DISTRIBUTION</u>: The white-tip nematode, *Aphelenchoides besseyi* is distributed in India, Bangladesh, Srilanka, Japan, Indonesia, Taiwan, Italy, & Madagascar. It causes about 17.4 to 54.1 % yield losses.
- b) <u>SYMPTOMS</u>: *Aphelenchoides besseyi* mainly causes White Tip disease of rice, that mainly occurs at almost all rice growing areas.

During early growth, the most peculiar symptom is the emergence of the chlorotic tips of new leaves from the leaf sheath. The tips of leaves later dry & curl, whereas the rest of the leaf may appear normal. The young leaves of infected tillers can be speckled with a white splash pattern, or have distinct chlorotic areas. In severe infections, the shortened flag leaf is twisted and can prevent the complete extrusion of the panicle from the boot. The grain is small and distorted & the kernel may be discoloured and cracked. Infected plants mature late and have sterile panicles borne on tillers produced from high nodes. The infested spiklet show numerous nematodes when shown under electron microscope. c) **<u>BIOLOGY</u>**: When nematode infested seeds are shown into the field, the anhydrobiotic nematodes (immature preadult stage) rapidly become active & are attracted to the meristematic areas. The eggs are laid in the leaf axis or in panicles and many generations are formed in one season. During early growth, the



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nematodes are found within innermost leaf sheath in low numbers, feeding ectoparasitically around the apical meristem. The number of nematodes increase in late tillering stage and is associated with the reproductive phase of plant growth. Nematodes are able to enter spikelets before anthesis, within the boot, and feed ectoparasitically on the ovary, stamens, lodicules and embryo. *Aphelenchoides besseyi* is more abundant on the outer surface of the glumes & enter when separation occurs during anthesis. The nematodes' growth is stopped during the grain filling & maturation phase but the development of J3 to adult continues until the hard dough stage.

*Aphelenchoides besseyi* is amphimictic & reproduction can be parthenogenetic. The optimum temperature for oviposition and hatch is 30°C. No development occurs below 13°C. The life cycle takes 8 days at 23 °C & 10 days at 21 °C. Normally 5 to 6 nematodes are found in each seed.

- d) <u>HOST RANGES</u>: The nematode also infests *Setaria italica*, *Setaria viridis*, *Panicum sanguinale & Cyperus iria*. The other plants that are infected by this nematode are strawberry, chrysanthemum, tuberose, *Pennisetum typhoides*, *Ficus elastica*.
- e) <u>MANAGEMENT</u>: 1) Hot water treatment of seeds at 55 °C for 15 minutes prior to sowing or seed disinfestation by sun drying for 12 hours between 9 am & 3 pm for 2 days.
  - 1) Use of certified seeds can eliminate the nematodes.
  - 2) Early planting if rice season is preceded by a cooler period.
  - Burning of stubbles after harvest for preventing perpetuation of the nematode in the field through dormant nematodes.
  - 4) Spray Monocrotophos 36EC @1000ml/ha at the boot leaf stage in 500 litres of water.

#### References

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