



## THE MAIN NEMATODES WHICH PEST SUNFLOWER PLANTS

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### Abstract

This article presents the countries most affected by nematodes, several types of nematodes that damage sunflower plants, and several methods of combating them, as well as measures to prevent damage.

**Keywords:** Nematodes damaging sunflower plants, Meloidogyne, Pratylenchus, Helicotylenchus spp., Heterodera spp., integrated control measures.

### Introduction

Problems related to nematodes are one of the factors that have a negative impact on agriculture. These parasites damage the roots of plants and reduce their growth and productivity. Nematodes are mainly distributed more in areas with warm and humid climate. The following countries are considered to be highly affected by nematodes. These are mainly India, Brazil, China, USA, Indonesia, Philippines and African countries.

In particular, the hot climate and moist soil in India are favorable conditions for nematode reproduction. Because of this, mainly cotton, vegetables and many other agricultural crops are affected in India.

Nematodes are common in Brazil, mainly in areas where coffee, soybeans and other agricultural products are grown.

In China, Africa and USA, nematodes cause great damage to agricultural crops. Among the African countries, Nigeria and Kenya, mainly in the southern states of the USA, especially Florida and Texas, have a high level of infection with nematodes. In these countries, integrated management methods have been developed to combat nematodes, and nematode-resistant varieties and biochemical control measures have been introduced.

The sunflower plant is one of the most important plants for agriculture, and its damage by various pests, especially nematodes, causes a sharp decrease in productivity.

Including Meloidogyne spp. The nematode forms a bulge in the sunflower root and causes serious damage to the plant by reducing the absorption of nutrients. These nematodes are mostly found in hot and humid conditions and sandy soils. Among





them, *Meloidogyne incognita* and *Meloidogyne javanica* species are widespread and cause yellowing of plant leaves and the appearance of spots on the lower part, and slow down plant growth and cause a sharp decrease in productivity.

*Pratylenchus* spp., nematodes of this type enter the root of the sunflower plant, damage the cells, parasitize the root tissues, suck nutrients and weaken the root system, weakening the plant. Harmful species: *Pratylenchus penetrans*, *Pratylenchus thornei*.

*Helicotylenchus* spp., such nematodes are found mainly in the upper layers of the soil and live in the outer part of the root and have a negative effect on the root nutrition process and prevent the growth of the plant root.

According to Evans, K., and Perry, R.N. (2009), *Heterodera* spp., this type of nematode settles in the roots of the sunflower plant and causes a serious slowdown in the growth and development of the plants. In particular, *Heterodera schachtii* is the most harmful species for this plant. Effect of nematodes on sunflower plant and signs of damage.

Changes in the soil and roots: Bumps, swellings or ulcers appear on the plant roots.

Changes in the external signs of the plant: As a result of the yellowing and withering of the leaves and the slowing of the growth of the root, the drying of the plant is observed.

Decrease in productivity: After nematodes damage the root system of the plant, the nutrition of the sunflower plant is limited and it stops developing, causing a sharp decrease in productivity.

Methods of combating sunflower nematodes.

Mainly, the cultivation of resistant varieties of sunflower, which are resistant to nematodes, crop rotation, soil fumigation, the use of biological agents, that is, the use of beneficial microorganisms against sunflower nematodes, such as *Paecilomyces lilacinus*, *Bacillus subtilis*, are of great importance. In the selection of resistant cultivars, the use of cultivars resistant to *Meloidogyne incognita* has been found to be effective. In crop rotation, it is recommended to plant corn or grain crops along with sunflower. Crop rotation helps reduce soil nematode populations, according to Stirling, G. R. In addition, soil fumigation means soil disinfection using special chemicals. For example, soil treatment using methyl bromide and other fumigants is also one of the effective methods. Also, enriching the soil with organic fertilizers and compost is one of the main factors that cause the natural reduction of these nematodes. Of course, the sunflower (*Helianthus annuus*) plant is an agricultural crop that plays an important role in human life. In sunflower fields affected by nematodes, the yield decreases by 30-80%, and this leads to an increase in economic damage





indicators. In addition, as a result of changes in the oil composition and quality of sunflower pistachios infected with nematodes, the level of linoleic and oleic acids in the oil decreases, causing it to not meet the requirements of healthy nutrition. The use of fumigants to increase sunflower yield is also one of the effective ways to reduce the nematode population in the soil by up to 80%.

In conclusion, we can say that the sunflower plant is one of the important plants for human food security, economic stability and ecological health. By fighting with nematodes, it is possible to increase its productivity and strengthen its position in agriculture. For this reason, identification of nematodes that have a serious effect on the sunflower plant, development of integrated management systems and science-based measures, and wide implementation is one of the urgent issues.

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