TAGETES: NEMATODE UNFRIENDLY MEDICINAL, ORNAMENTAL PLANT

TAGETES – PLANTĂ MEDICINALĂ, ORNAMENTALĂ, OSTILĂ PENTRU NEMATOZI

Ionică PROHAB*, Ioan BORCEAN*

****DADR Timişoara, **USAMVB Timişoara***

Abstract: *Tagetes patula (common name marigold) has been cultivated for its receptacleless flower (Tagetes flos sine receptaculis) containing volatile oil (0.5-1.5%) helenine, a substance used in medicine for the quick adaptation of the eye to different light intensities. In Germany, they pay a lot of attention to this plant for the nematode control properties of the roots. In this paper the authors present the results of their research carried out between 2006 and 2008 on a gleyed aluvisoil in the Timişului Plain located in Western România. The goal of the research was to control nematodes in vegetable gardens by cultivating Tagetes patula and Tagetes erecta species in alternation with vegetables. Results are original and particularly important in Pratylencus nematode control in vegetable gardens within ecological technologies (no insecticides). Results point out the possibility of controlling Pratylencus nematodes (40-70%) depending on the Tagetes species used.*

Rezumat: *Tagetes patula-(French marygold) se cultivă pentru flori fără receptacul (Tagetes flos sine receptaculis) care conţin ulei volatil (0,5-1,5%) helenienă , substanţă folosită în medicină pentru adaptarea rapidă a ochiului la diferite intensităţi de lumină. În Germania se acordă atenţie acestei plante însuşirea rădăcinilor de combatere a nematozilor. Lucrarea conţine rezultatele cercetărilor din perioada 2006-2008 efectuate pe un sol de tip aluviosol gleizat din Câmpia Timişului, situată în partea de Vest a României. Obiectivul cercetări a fost de combatere a nematozilor din grădinile de legume prin cultivarea intercalată a speciilor de Tagetes patula şi Tagetes erecta. Rezultatele sunt originale şi deosebit de importante pentru combaterea nematozilor Pratylencus din grădinile de legume, în condiţiile unor tehnologii ecologice, fără utilizarea insecticidelor. Rezultatele evidenţiază posibilitatea combaterii a nematozilor Pratylenchus cu 40-70%, în funcţie de Tagetes folosită.*

Key words: *Tagetes sp., nematode hostile plants*
Cuvinte cheie*: Tagetes sp., plante ostile nematozilor*

INTRODUCTION

Practicing ecological agriculture on vegetable farms is an issue that is carefully studied. Among the difficulties it develops is nematode control.

Among the solutions German researchers suggest to control nematodes in ecological agriculture is the use of trap-plants among which the *Tagetes* species.

Marigold is being cultivated for their receptacleless flowers (*Tagetes flos sine receptaculis)* which contain volatile oil (0.5-1.50%), helenine, flavonoids, etc.

Helenine increases eye's adaptability to different light intensities.

The plant is also being cultivated for ornamental purposes, particularly the species *Tagetes patula* L, *Tagetes erecta* L. and *Tagetes signala* Barth.

In Germany, they pay a great deal of attention to the control of nematodes in vegetable farming with the help of *Tagetes* species.

MATERIAL AND METHODS

We used, in our research, the species *Tagetes patula* L. and *Tagetes erecta* L..

Measurements were made on samples collected before sowing, on April 10, and in the last decade of October, i.e. on October 30.

Among the nematodes we studied was *Pratylenchus*.

The functioning mechanism of the method is base don the content of Tagetes species in certain substances (Terthiophere) that have a strong effect against nematodes.

These substances are in the cells of the root endoderm and, when the nematodes pierce the cells, they get into touch with them and die.

Tagetes are inefficient or they have a low efficacy against cyst nematodes for which it is not a host plant; this is why we did not study this aspect.

RESULTS AND DISCUSSION

In the variant in which we cultivated *Tagetes patula* the nematode control percentage in 2006 was 63%, in 2007 it increased to 84%, and in 2008 it reached 72%, i.e. an average nematode control of 73%.

In the variant in which we cultivated *Tagetes erecta* the efficacy of *Pratylenchus* nematode control was 45% in 2006, 50% in 2007 and 41% in 2008, i.e. an average control of 45%.

Observations carried out during the three experimental years show that in ecological crop son vegetable farms cultivating species of *Tagetes patula* and *Tagetes erecta* in an intricate way can lead to an efficient control of *Pratylenchus* nematodes.

On lands free of weeds it is preferable to cultivate the species *Tagetes patula* whose control percentage reached 70%, while on lands threatened by weeding it is preferable to cultivate *Tagetes erecta*, though the difference is small, but with an alert growth rate and with a better weed control.

Table 1.

The Number of *Pratylenchus* Nematodes Determined for a 250 ml Homogenized Sample

Species of *Tagetes*	Year of measurement	Date of analysis sample	
		10 – 15 IV	25 -30 X
Tagetes patula L	2006	70	20
	2007	80	30
	2008	60	10
	X	70	20
Tagetes erecta	2006	180	100
	2007	140	70
	2008	220	130
	X	180	100

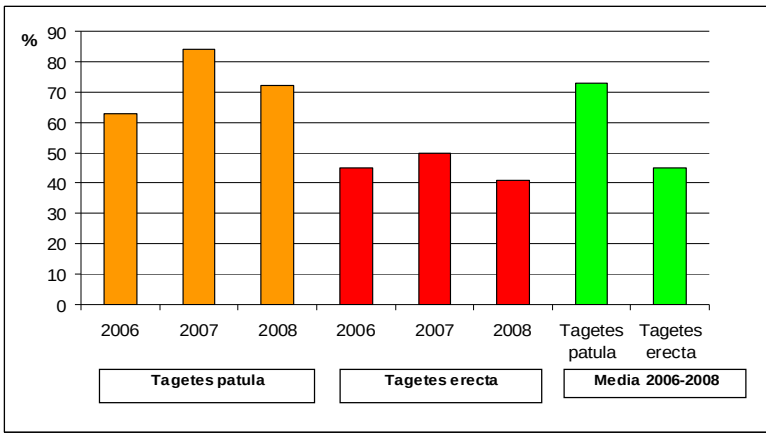

Figure 1. The decrease of the (Pratylencus) nematodes number depending on the annual conditions an on the *Tagetes* species (%)

CONCLUSIONS

1. On ecological cultures on vegetable farms we can control *Pratylenchus* nematodes efficiently using hostile plants such as the species *Tagetes patula* L. and *Tagetes erecta* L.

2. On lands free of weeds we can cultivate *Tagetes patula* L., while on more weeded lands we can cultivate *Tagetes erecta* L.

3. The positive effect of decreasing the number of *Pratylenchus* nematodes by cultivating the species *Tagetes patula* L. and *Tagetes erecta* L. also persisted the following years.

LITERATURE

1. AXINTE M., ROMAN GH., BORCEAN I., MUNTEAN L.S., 2006 - Fitotehnie, Ed. Ion Ionescu de la Brad, Iaşi,
2. CONSTANTINESCU, GR., ELENA HAŢIEGANU-BURUIANĂ, 1986 - Să ne cunoaştem plantele medicinale - proprietăţile lor terapeutice şi modul de folosire, Bucureşti, Ed. Medicală.
3. COŞOCARIU, O., 1986- 1988 - Tratat de plante medicinale şi aromatice cultivate, Bucureşti, vol. I- II, Ed. Academiei R.S.R..

4. CRĂCIUN, F., CONSTANTINESCU, A., 1969 - Plantele medicinale şi aromatice cultivate, Bucureşti, Ed. Centrocoop.
5. MALE STEFANIA, 1986 - Tehnologii cadru pentru cultura plantelor medicinale şi aromatice, MA. ASAS, Trustul Plafar, SCPMA Fundulea, Ed. Recoop, Bucureşti.
6. MUNTEAN L. S. , TAMAŞ M., MUNTEAN S., MUNTEAN L., DUDA M., VÂRBAN D., FLORIAN S., 2007 - Tratat de plante medicinale cultivate şi spontane, Ed. Risoprint, Cluj Napoca.
7. PĂUN, E., MIHALEA, A., DUMITRESCU, A., VERZEA MĂRIA, COŞOCARIU O., 1986 – 1988 - Tratat de plante medicinale si aromatice cultivate, vol. I, II, Bucureşti, Ed. Academiei.
8. PROHAB I., 2009 - Contribuţii la tehnologia de cultivare a speciei Tagetes patula L., Teză de doctorat USAMVB Timişoara.
9. VERZEA MĂRIA ŞI COLAB., 2000 - Tehnologii de cultură la plantele medicinale şi aromatice, Bucureşti, Ed. Orizonturi.