

# **A survey of potato fields for root knot nematode in Ngablak Center Java**

*Fannia Suri and Upali Jayasinghe  
International Potato Center, Bogor, Indonesia*

Multiplication of potatoes under field conditions is an important step during the production of quality seed in a seed program. Field multiplications are aimed at bulking for reducing costs. However, it is during this stage that the plants are more vulnerable to the attack by airborne and soil born pathogens directly reducing the quality of the seed produced. Many soil born pathogens attack potatoes among them bacterial wilt, scab and nematodes are considered as the most important in Center Java.

Field visit to Ngablak indicated the presence of root knot nematode in the fields of farmers who are seed producers for a nearby cooperative. Many of the farmers indicated that they have to discard more than 50% of their harvest, due to the deformation of the tubers caused by root knot nematodes.

The objective of this research was to determine the extent of distribution of root knot nematode in farmers' fields in this area.

## **Methodology**

Using a homemade augur 50cm deep soil samples were taken at a rate of 30 samples per hectare. The soil samples from one individual farmer field were mixed and collected in to black plastic bags of size 25 X 25 cm. Samples were collected from nearly 300 fields belonging to different farmers randomly distributed in the area. The number of samples collected per field varied according to the size of the field of an individual farmer.

During the soil sampling, crop plants and weeds present in the farmers' fields were also collected along with the roots and observed for the presence of the galls caused by root knot nematode.

Soil samples collected were brought to the CIP laboratory in Bogor and stored until use in an air-conditioned room away from direct sunlight. Soil samples were tested using the tomato test as described by Church et al, 1959. Irrigation was done regularly using boiled and cooled water to prevent contamination from bacterial wilt and / or root knot nematodes present in the irrigation water. One and a half months after transplanting the tomato plants were observed for the presence of galls.

During collection of samples, a GPS recorder (GARMIN/GPS Type 12) was used to record the global positions for future studies and reference.

## Results

The results obtained from the 300 fields sampled in the area are in Table 1. More than 97% of the fields were infested with the root knot nematode an indication of extensive distribution of the pest in the farmer's fields in the area.

The most popular crops grown by farmers' tobacco and tomato which, were growing during the time of survey indicated the presence of galls. Other crops (Table 2) which are usually grown during other seasons were observed during they cropping season. Majority of the weeds collected was gramineae and could not be identified since flowers were not available. However none of them showed any galls caused due to root knot nematode infection. Weeds such as *Cyperus rotundus* L., wild green mustard, Yacon (*Smallanthus sonchifolius* (Poepp. & Endl.) H. Robinson) as a volunteer plant, and *Galinsoga parviflora* Cav., showed the presence of galls.

## Discussion and Conclusion

The survey results indicated that the root knot nematode is wide spread in Ngablak fields. Since this is a seed producing area in Central Java it is possible that this pest has been distributed to other localities in Indonesia through the seed. Farmers are aware of the problem and they desperately use different chemical treatments to control the pest without much success. Crops grown by the farmers are also susceptible to the disease and some weeds collected also indicate the presence of galls. Therefore controlling this disease by breaking the life cycle of the pest using crop rotation will be an impossible task.

As a long term strategy for controlling this pest in this area a research project should be started to screen new varieties imported from other countries or from the local breeding program which are resistant to this pest.

## References

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Table 1. Percent field Infested with Root-knot Nematode in Ngablak, Central Java

<b>Village</b>	<b>Subsdistrict</b>	<b>Total No.of Field tested</b>	<b>% Infested</b>
Ngablak	Ngablak	34	100
Bandungrejo	Ngablak	27	100
Jogonayan	Ngablak	16	75
Genikan	Ngablak	24	95
Tejosari	Ngablak	24	100
Sumberejo	Ngablak	18	100
Girirejo	Ngablak	32	100
Jogoyasan	Ngablak	15	100
Magersari	Ngablak	19	100
Selomirah	Ngablak	7	100
Kanigoro	Ngablak	1	100
Madyogondo	Ngablak	19	100
Pagergunung	Ngablak	5	20
Seloprojo	Ngablak	5	100
Keditan	Ngablak	13	92
Pandean	Ngablak	27	100
Pakis	Pakis	3	100
Gondangsari	Pakis	1	100
Kopeng	Getasan	4	100
Sumogawe	Getasan	1	100

Table 2. Crops Grown in Ngablak, Central Java and Their Reaction to Root-knot Nematode

Common Name	Scientific name	Presence of Galls
Carrot	<i>Daucus carota</i> L.	Yes
Cabbage	<i>Brassica oleracea</i> L.	Yes
Scallion	<i>Allium fistulosum</i> L.	Yes
Tobacco	<i>Nicotiana glauca</i> L.	Yes
Potato	<i>Solanum tuberosum</i> L.	Yes
Tomato	<i>Lycopersicon esculentum</i> Miller	Yes
Red pepper	<i>Capsicum annuum</i> L.	Yes
String bean	<i>Phaseolus vulgaris</i> L.	Yes
Corn	<i>Zea mays</i> L.	Yes
Garden pea	<i>Pisum sativum</i> L.	Yes
White mustard	<i>Brassica hirta</i> (L.) Czern.	Yes
Mustard	<i>Brassica juncea</i> (L.) Czern	Yes
Orange	<i>Citrus nobilis</i> (?)	Yes*
Celery	<i>Apium graveolens</i> L.	Yes
Banana	<i>Musa paradisiaca</i> L.	Yes*

\* according to literature