

Nematological Myths, III

Should nematode control be expected to last till lifting?

Dr Robin Jones

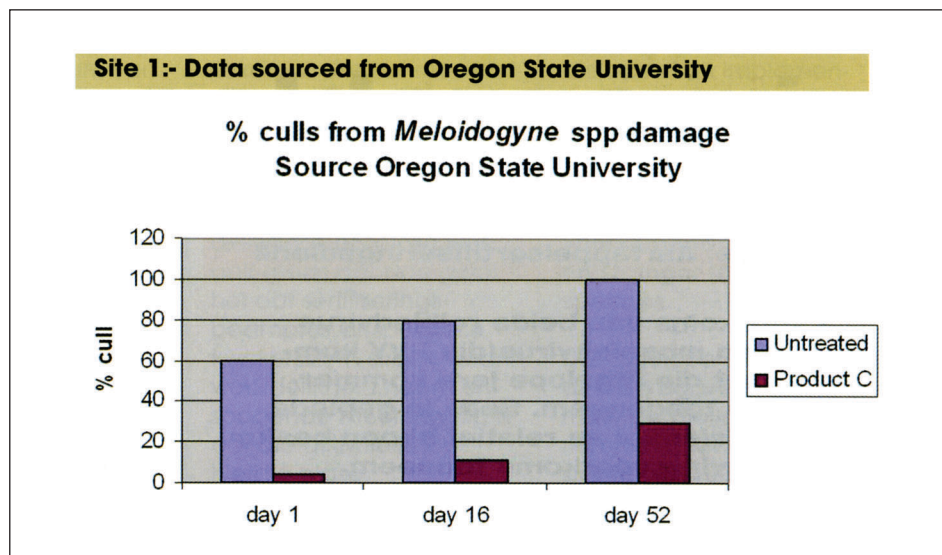
Clearly a potato producer expects a nematicide to provide nematode free tubers when he lifts his crop. But that same farmer wants flexibility to market tubers when prices are favourable, thus he will store them in the soil for an undetermined period. Obviously the farmer is aware he will be placing his crop at risk to nematode damage but how great is this risk?

Potato tubers are good hosts for many nematodes, especially *Meloidogyne* spp, root knot nematodes. These nematodes, in sandy soils, are able to readily detect and invade roots and developing and mature tubers and establish a damaging population very quickly. The root knot nematode egg to egg life cycle depends on soil temperature but is around 30 days at 25°C. One female lays about 400 eggs. Once a tuber is invaded, population build up is rapid. The juveniles are already in a suitable host and just migrate within the tuber and begin to feed immediately. One female per tuber is unlikely to cause damage, but 400 females 30 days later can result in severe damage. This argument is theoretical, but what is the reality?

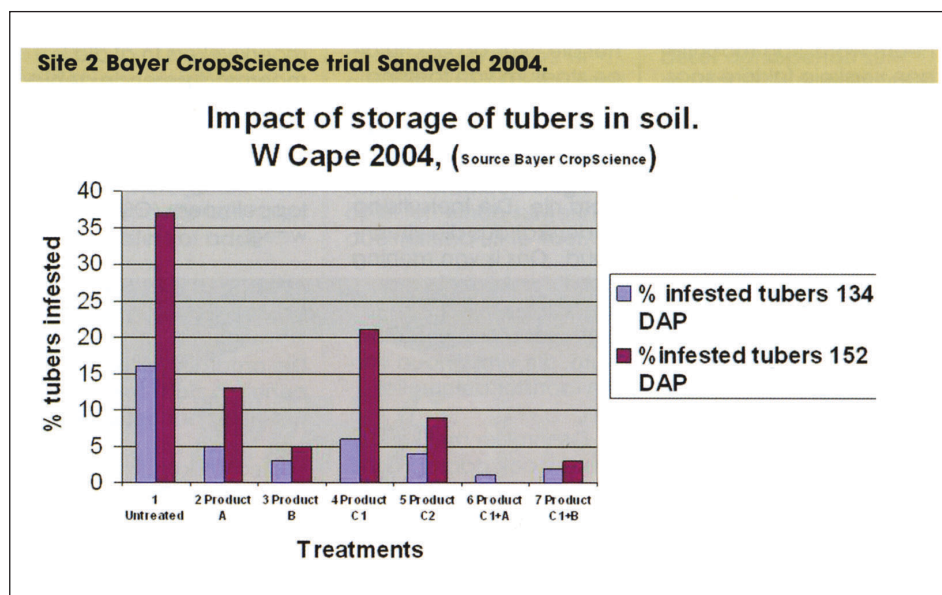
The three charts below illustrate the build of an infestation in tubers following storage in the soil.

Results from site 1 indicate that at maturity 60% tubers were culled in the untreated. 15 days later, half a life cycle, this increased to 80% a 20% increase. Over the next 36 days all tubers became infested. In the treated section, infestation increased from 2% to 11% in 15 days and from 11% to 30% in 36 days, increases of 9% and 29% respectively.

Site 2 was a trial of Bayer CropScience's planted in the Sandveld in the 2004 season. Tubers were inspected 134 and 152 days after plant (DAP), an interval of 18 days and during this period the % tubers infested in the untreated increased from 16% to 37%, a 21% increase. All the nematicide products reduced the damage, but in all cases where a single nematicide was used, treatments 2 to 5,



Site 1. Data sourced from Oregon State University.



Site 2. Bayer CropScience trial Sandveld 2004.

the increase in damage in 18 days was marked, notably treatment 4 where damage increased from 6% to 21%, an increase also of 19%.

The final set of data, site 3, is from another trial of Bayer CropScience's planted in Christiana also in the 2004 season. Tubers were inspected 90 and 132 days after plant, an interval of 42

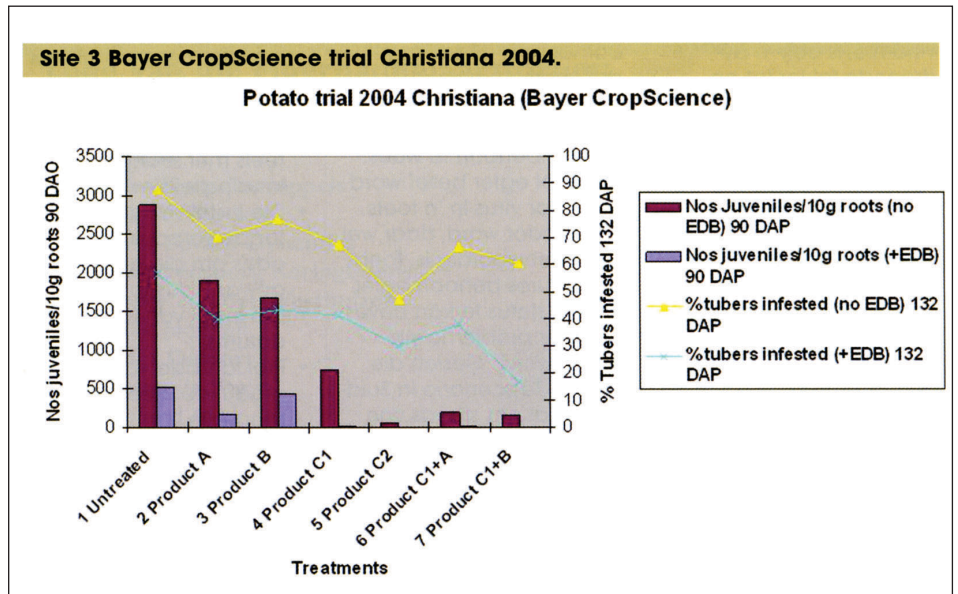
days. The 90 day assessment was based on numbers of juveniles, whereas the 132 day data assessed % infested tubers. At 90 DAP treatments 5 to 7 were virtually undamaged, but by 132 DAP infestation ranged from 15 to 65%.

These results illustrate the danger of field storage. In site 1, 15 days field storage resulted in an infestation

increase of up to 20%; in site 2, 18 days field storage increased infestation by up to 22%; and in site 3, 42 days field storage, one and a half nematode life cycles, increased infestation by up to 65%.

Conclusions are obvious:-

- Field storage is dangerous.
- When the effects of a nematicide have broken down, damage also builds up quickly.
- To minimise risk, lift at maturity.
- If field storage is planned, a very poor recommendation, inspect the field thoroughly and regularly (daily) and lift immediately damage is identified.



Site 3. Bayer CropScience trial Christiana 2004.