

EFFECTS OF COVER CROPS, METAM SODIUM AND VYDATE C-LV ON ROOT-KNOT, LESION AND STUBBY-ROOT NEMATODES IN POTATO

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Introduction

- Columbia root-knot nematode (*Meloidogyne chitwoodi*) infects tubers to cause quality defects that can result in crop rejection at very low nematode population densities.
- *Verticillium* can cause potato plants to die early and significantly reduce yield.
- Telone controls Columbia root-knot nematode, but not *Verticillium*.
- Metam sodium controls *Verticillium*, but not Columbia root-knot nematode.
- Therefore, double fumigation with both products is required where both pathogens are present.
- Recent work has demonstrated that Vydate, which is much cheaper than Telone, can suppress low population densities of Columbia root-knot nematodes.

The objective of this project was to determine if green manure cover crops or metam sodium could reduce Columbia root-knot populations to levels that could be controlled by Vydate,

Methods

Following an oat crop, mustard cv Martigena at 7 lb/a and radish cv Colonel at 25 lb/a were planted August 17 and incorporated as green manure on October 25, 2001. Red clover cv Mammoth at 20 lb/a was included as a “nonsuppressive” cover crop to serve as a control.

Metam sodium was applied at 38 gpa in 3/4 in water on November 8, 2001. Potato cv Russet Norkotah was planted April 19, 2002 and Vydate at 2.1 pts/a was applied in furrow at planting, banded before hilling (May 29) and chemigated in 1/2 in. water on July 5. Plots were harvested September 5 and 25 tubers from each plot were peeled and evaluated for nematode infection.

Results

- Columbia root-knot nematode declined in all irrigated plots regardless of cover planted (Fig. 1).
- Although initial suppression after incorporation was equal, after potato was planted populations increased: rapidly after clover, more slowly after radish, and least rapidly after mustard (Fig. 2).
- Suppression of root-knot populations by three applications of Vydate C-LV at 2.1 pts/a early in the season was still apparent at harvest. Lowest populations were in plots with mustard plus Vydate or metam sodium plus Vydate (Fig 2.).
- Radish suppressed stubby-root (Fig. 3) and root-lesion (Fig. 4) populations more than mustard.
- Cover crops, metam sodium or Vydate alone did not reduce root-knot nematode damage to tubers. However, Vydate reduced the percentage of damaged tubers more after mustard (85% reduction) or metam sodium (76% reduction) than after clover (14% reduction) (Fig. 5).
- Levels of tuber damage were near acceptable limits with mustard plus Vydate or metam sodium plus Vydate. One or two more applications of Vydate may be necessary for complete protection.
- Yield tended to be highest with mustard or metam sodium but differences were not significant. There was a trend for higher yield in plots treated with Vydate (4%) but it was not significant. Only plots that received metam sodium and Vydate were statistically higher than plots that followed a clover cover crop (Fig. 6).

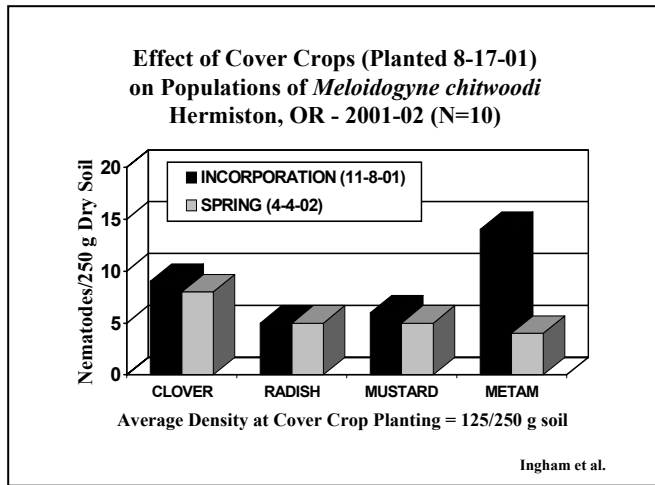


Figure 1. Effects of cover crops and metam on Columbia root-knot nematodes.

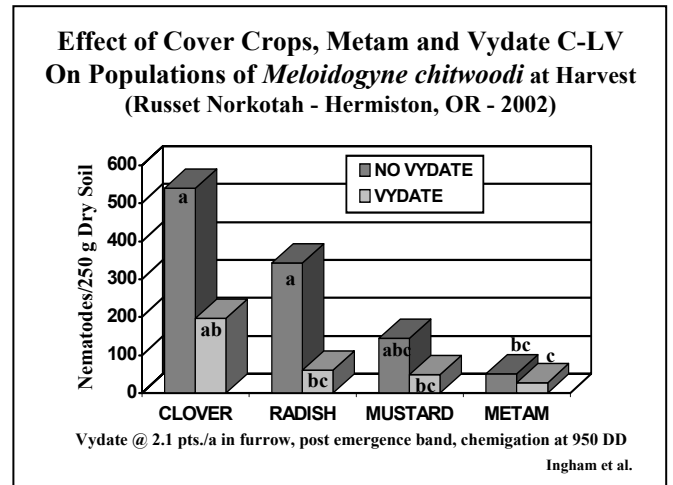


Figure 2. Effects of cover crops, metam and Vydate on populations of root-knot nematodes.

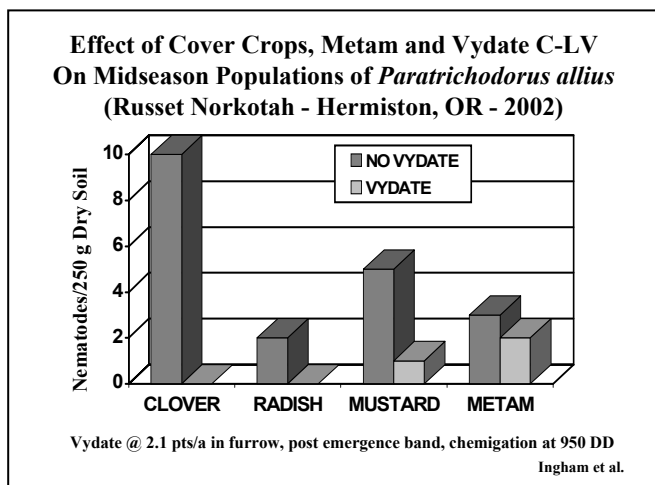


Figure 3. Effects of cover crops, metam and Vydate on populations of stubby-root nematodes.

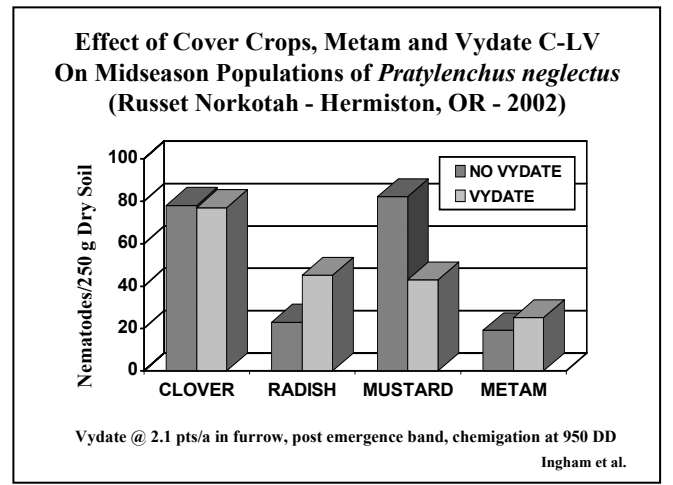


Figure 4. Effects of cover crops, metam and Vydate on populations of root-lesion nematodes.

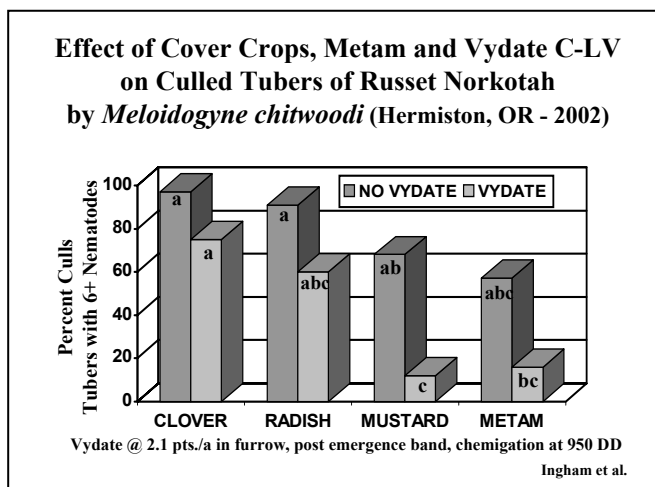


Figure 5. Effects of cover crops, metam and Vydate on root-knot nematode damage to tubers.

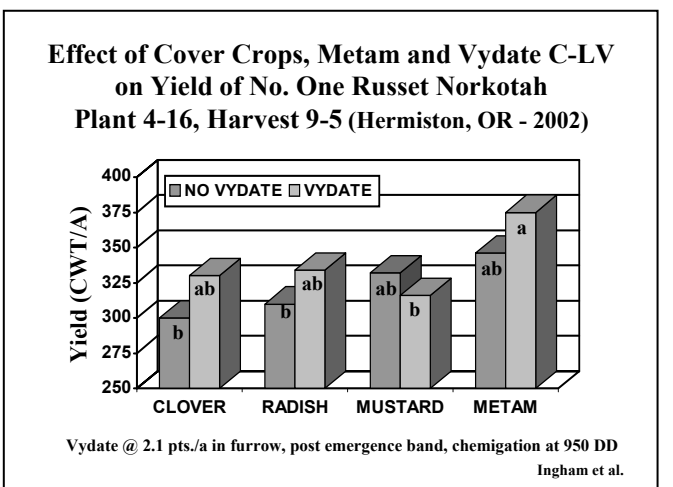


Figure 6. Effects of cover crops, metam and Vydate on yield of Russet Norkotah.