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.