

NEW NEMATODE ISSUES AND 2004 NEMATOCIDE FIELD TRIALS

E. Riga (riga@wsu.edu), Washington State University, IAREC, Prosser, WA 99350

Summary: Mocap, Telone, and Vydate were evaluated for control of the plant parasitic nematodes on Russet Burbank potatoes in a field naturally infested with the nematodes at the Washington State University, IAREC, Prosser, WA - Pear Acres Unit.

In addition two plant parasitic nematodes of threat to Washington State potatoes have been found in the Columbia basin.

NEMATOCIDE TESTING – 2004 SEASON

Table 1. Populations of root knot nematodes, *Meloidogyne chitwoodi*, lesion nematodes, *Praty-*

M. chitwoodi

Treatments	Pre-season	Harvest
Control	8 ± 21	467 ± 1013
Temik 20lb/A 6 in band 4 inch deep	3 ± 5	130 ± 300 a
KC 15.5lb/A 3 in band 4 inch deep	8 ± 17	463 ± 667
Mocap 2 gal	7 ± 20	200 ± 400 a
Mocap 2 gal + KC 15.5lb/A	16 ± 35	388 ± 465
Mocap 6EC 2 gal + Temik 20lb/A	14 ± 26	233 ± 420 a
Mocap 2 gal + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	12 ± 40	120 ± 300 a
Temik 20lb/A + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	17 ± 53	300 ± 550
Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	11 ± 24	280 ± 456
Vydate 4.2pt/A at plant + 2.1 pt/A + 2.1pt/A + 2.1pt/A	5 ± 5	294 ± 990
KC 15.5lb/A at plant in furrow 3 inch band	4 ± 8	220 ± 100 a

Pratylenchus spp.

Treatments	Pre-season	Harvest
Control	5 ± 12	32 ± 72
Temik 20lb/A 6 in band 4 inch deep	3 ± 9	20 ± 44
KC 15.5lb/A 3 in band 4 inch deep	3 ± 5	7 ± 26 a
Mocap 2 gal	3 ± 7	9 ± 22 a
Mocap 2 gal + KC 15.5lb/A	4 ± 9	15 ± 46
Mocap 6EC 2 gal + Temik 20lb/A	2 ± 5	6 ± 15 a
Mocap 2 gal + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	2 ± 4	10 ± 25 a
Temik 20lb/A + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	2 ± 3	8 ± 31 a
Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	3 ± 5	13 ± 31 a
Vydate 4.2pt/A at plant + 2.1 pt/A + 2.1pt/A + 2.1pt/A	3 ± 10	12 ± 13 a
KC 15.5lb/A at plant in furrow 3 inch band	3 ± 5	6 ± 20 a

Stubby Root Nematodes

Treatments	Pre-season	Harvest
Control	2 ± 2	16 ± 43
Temik 20lb/A 6 in band 4 inch deep	3 ± 2	3 ± 10 a
KC 15.5lb/A 3 in band 4 inch deep	2 ± 2	6 ± 19 a
Mocap 2 gal	3 ± 8	3 ± 12 a
Mocap 2 gal + KC 15.5lb/A	2 ± 4	2 ± 8 a
Mocap 6EC 2 gal + Temik 20lb/A	4 ± 6	2 ± 8 a
Mocap 2 gal + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	2 ± 5	2 ± 5 a
Temik 20lb/A + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	3 ± 5	0 a
Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	2 ± 3	2 ± 8 a
Vydate 4.2pt/A at plant + 2.1 pt/A +2.1pt/A +2.1pt/A	2 ± 3	2 ± 8 a
KC 15.5lb/A at plant in furrow 3 inch band	2 ± 4	4 ± 11 a

Free-living Nematodes

Treatments	Pre-season	Harvest
Control	66 ± 89	251 ± 274
Temik 20lb/A 6 in band 4 inch deep	66 ± 53	210 ± 117
KC 15.5lb/A 3 in band 4 inch deep	61 ± 60	210 ± 117
Mocap 2 gal	39 ± 54	280 ± 241
Mocap 2 gal + KC 15.5lb/A	58 ± 29	190 ± 185
Mocap 6EC 2 gal + Temik 20lb/A	68 ± 40	168 ± 182
Mocap 2 gal + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	52 ± 44	143 ± 150
Temik 20lb/A + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	64 ± 57	185 ± 197
Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	71 ± 58	128 ± 208
Vydate 4.2pt/A at plant + 2.1 pt/A +2.1pt/A +2.1pt/A	66 ± 66	192 ± 290
KC 15.5lb/A at plant in furrow 3 inch band	46 ± 33	202 ± 180

Table 2. Russet Burbank potato tuber rating due to root knot *Meloidogyne chitwoodi*, from Mocap treated field plots, WSU-IAREC, Prosser, WA, 2004.

Treatments	% Infection	% Culls	Infection Index
Control	100 ± 0	100 ± 0	5.7 ± 0.2
Temik 20lb/A 6 in band 4 inch deep	18 ± 3 a	10 ± 3 a	0.5 ± 0.2 a
KC 15.5lb/A 3 in band 4 inch deep	33 ± 6 a	24 ± 6 a	1.2 ± 0.2 a
Mocap 2 gal	11 ± 9 a	4.8 ± 1 a	0.2 ± 0.01 a
Mocap 2 gal + KC 15.5lb/A	17 ± 9 a	10 ± 8 a	0.5 ± 0.3 a
Mocap 6EC 2 gal + Temik 20lb/A	7 ± 4 a	7.5 ± 4 a	0.3 ± 0.2 a
Mocap 2 gal + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	3 ± 2 a	1.3 ± 1 a	0.08 ± 0.05 a
Temik 20lb/A + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	1 ± 1 a	0 ± 0 a	0.01 ± 0.01 a
Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	15 ± 6 a	11.3 ± 5 a	0.5 ± 0.3 a
Vydate 4.2pt/A at plant + 2.1 pt/A +2.1pt/A +2.1pt/A	10 ± 9 a	2.5 ± 2 a	0.2 ± 0.2 a
KC 15.5lb/A at plant in furrow 3 inch band	33 ± 7 a	26.3 ± 6 a	1.3 ± 0.3 a

Table 3. Tuber yields (lb/plot) of Russet Burbank potatoes treated with Mocap against *Meloidogyne chitwoodi*, Pear Acres Unit, WSU-IAREC, Prosser, WA. 2004

Treatments	#1	#2	# Culls	Total yield (pounds)
Control	139	24	26	189.2
Temik 20lb/A 6 in band 4 inch deep	150	11	20	182.6
KC 15.5lb/A 3 in band 4 inch deep	176	26	33	104.8
Mocap 2 gal	216 a	28	33	275 a
Mocap 2 gal + KC 15.5lb/A	222 a	26	35	284 a
Mocap 6EC 2 gal + Temik 20lb/A	213 a	30	29	275 a
Mocap 2 gal + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	220 a	40 a	42 a	306 a
Temik 20lb/A + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	194	24	37	255
Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A	182	27	31	242
Vydate 4.2pt/A at plant + 2.1 pt/A +2.1pt/A +2.1pt/A	220 a	37 a	40	297 a
KC 15.5lb/A at plant in furrow 3 inch band	158	29	29	213

* Total yield includes data from #1, #2 potatoes and culls.

CONCLUSIONS – MOCAP

Values in all tables are means of five replicates. Values (\pm Standard Error) followed by a letter differ from the control, according to student t-test.

The following treatments reduced *M. chitwoodi* in the end of the season in comparison to the controls: Temik 20lb/A 6 in band 4 inch deep; Mocap 2 gal; Mocap 6EC 2 gal + Temik 20lb/A; Mocap 2 gal + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A; KC 15.5lb/A at plant in furrow 3 inch band

The following treatments reduced *P. penetrans* in the end of the season in comparison to the control: KC 15.5lb/A 3 in band 4 inch deep; Mocap 2 gal; Mocap 2 gal + KC 15.5lb/A; Mocap 6EC 2 gal + Temik 20lb/A; Mocap 2 gal + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A; Temik 20lb/A + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A; Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A; Vydate 4.2pt/A at plant + 2.1 pt/A +2.1pt/A +2.1pt/A; KC 15.5lb/A at plant in furrow 3 inch band

The following treatments reduced *P. allius* in the end of the season in comparison to the control: Temik 20lb/A 6 in band 4 inch deep; KC 15.5lb/A 3 in band 4 inch deep; Mocap 2 gal; Mocap 2 gal + KC 15.5lb/A; Mocap 6EC 2 gal + Temik 20lb/A; Mocap 2 gal + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A; Temik 20lb/A + Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A; Vydate 2.1pt/A + 2.1pt/A + 2.1pt/A; Vydate 4.2pt/A at plant + 2.1 pt/A +2.1pt/A +2.1pt/A

None of the treatments had a negative effect against free-living nematodes.

The % infection, % culls and Infection Index on potato tubers was significantly lower in all treatments in comparison to the untreated controls.

The following treatments yielded significantly more tubers than the control: Mocap 2 gal; Mocap 2 gal + KC 15.5lb/A; Mocap 6EC 2 gal + Temik 20lb/A; Vydate 4.2pt/A at plant + 2.1 pt/A +2.1pt/A +2.1pt/A

The best treatment overall was: #7 Mocap 2 gal+Vydate 2.1pt/A+2.1pt/A + 2.1pt/A.

Table 4. Populations of root knot nematodes, *Meloidogyne chitwoodi* (sampled at 1 and 2 feet), (per 250 cm³ soil) from Telone treated Russet Burbank potato field plots, WSU-IAREC, Prosser, WA, 2004.

M. chitwoodi Treatments	1 foot deep	
	09-09-03	10-18-04
Control	0	632 \pm 249
Telone 20 gal/a	19 \pm 9 a	0 a
Telone 15 gal/a + Vapam 30 gal/a	50 \pm 30 a	0 a
Vapam 37.5 gal/a	15 \pm 6 a	0 a
Mocap 2 gal/a	1 \pm 1	413 \pm 195
M. chitwoodi Treatments	2 feet deep	
Control	20 \pm 5	177 \pm 77
Telone 20 gal/a	72 \pm 44 a	0 a
Telone 15 gal/a + Vapam 30 gal/a	66 \pm 30 a	0 a
Vapam 37.5 gal/a	43 \pm 26 a	0 a
Mocap 2 gal/a	13 \pm 4	130 \pm 57

Table 5. Russet Burbank potato tuber rating due to root knot *Meloidogyne chitwoodi*, from Telone treated field plots, WSU-IAREC, Prosser, WA, 2004.

Treatments	% Infection	% Culls	Infection Index
Control	75.4 ± 4	64 ± 5	2.94 ± 0.3
Telone 20 gal/a	0 a	0 a	0 a
Telone 15 gal/a + Vapam 30 gal/a	1 ± 0.6 a	0 a	0.01 ± 0 a
Vapam 37.5 gal/a	0 a	0 a	0 a
Mocap 2 gal/a	31 ± 6 a	12 ± 4 a	0.7 ± 0.2 a

Table 6. Tuber yields (lb/plot) of Russet Burbank potatoes treated with Telone against *Meloidogyne chitwoodi*, WSU-IAREC, Prosser, WA. 2004

Treatments	#1	#2	# Culls	Total yield (lbs)
Control	1,437	70	55	1,564
Telone 20 gal/a	2,052	189 a	169 a	2,411 a
Telone 15 gal/a + Vapam 30 gal/a	2,574 a	167 a	73	2,814 a
Vapam 37.5 gal/a	2,620 a	249 a	134 a	3,003 a
Mocap 2 gal/a	1,456	924 a	152 a	1,698

* Total yield includes data from #1, #2 potatoes and

CONCLUSIONS - TELONE

Values in all tables are means of five replicates. Values (± Standard Error) followed by a letter differ from the control, according to student t-test. The following treatments reduced *M. chitwoodi* in the end of the season in comparison to the controls – at both sampling depth: Telone 20 gallons/acre; Telone 15 gallons/acre + Vapam 30 gallons; and Vapam 37.5 gallons/acre. The % infection, % culls and Infection Index on potato tubers was significantly lower in the following treatments: Telone II 20 gallons/acre; Telone 15 gallons/acre + Vapam 30 gallons; Vapam 37.5 gallons/acre. The following treatments yielded significantly more tubers than the control: Telone II 20 gallons/acre; Telone II 15 gallons/acre + Vapam 30 gallons ; Vapam 37.5 gallons/acre

Table 7. Populations of stubby root nematode, *Paratrichodorus allius*, lesion nematode, *Pratylenchus* spp., and free-living nematodes (per 250 cm³ soil) from Vydate treated Russet Burbank potato field plots, WSU-IAREC, Prosser, WA, 2004.

Stubby Root Nematode

Treatments	6-Apr	1-Nov
1) Control	40 ± 2	0
2) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2wks + 2wks + 2 wks + 2wks	12 ± 3.7 a	0
3) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2 wks + 2wks + 2wks	6 ± 1 a	0
4) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence +2 wks + 2wks	12 ± 3 a	0
5) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks +2 wks	14 ± 4 a	0
6) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks	13 ± 2 a	0
7) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks	10 ± 3.5 a	0
8) Vapam 50 gal/A + Vydate 1.0 lb/A 2 weeks after emergence + 2 wks + 2wks	5 ± 1.5 a	0
9) Vapam 50 gal/A	6 ± 2.4 a	0

Lesion Nematode

Treatments	6-Apr	1-Nov
1) Control	720 ± 34	115 ± 50
2) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2wks + 2wks + 2 wks + 2wks	168 ± 39 a	0 a
3) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2 wks + 2wks + 2wks	286 ± 93 a	0 a
4) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence +2 wks + 2wks	178 ± 62 a	0 a
5) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks +2 wks	168 ± 38 a	0 a
6) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks	242 ± 29 a	0 a
7) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks	146 ± 32 a	0 a
8) Vapam 50 gal/A + Vydate 1.0 lb/A 2 weeks after emergence + 2 wks + 2wks	198 ± 61 a	0 a
9) Vapam 50 gal/A	246 ± 58 a	0 a

Free-living Nematodes

Treatments	6-Apr	1-Nov
1) Control	674 ± 131	876 ± 117
2) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2wks + 2wks + 2 wks + 2wks	716 ± 121	620 ± 111
3) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2 wks + 2wks + 2wks	2268 ± 1678 a	576 ± 76
4) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence +2 wks + 2wks	492 ± 39	620 ± 114
5) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks +2 wks	618 ± 149	732 ± 149
6) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks	650 ± 83	632 ± 61
7) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks	494 ± 83	732 ± 180
8) Vapam 50 gal/A + Vydate 1.0 lb/A 2 weeks after emergence + 2 wks + 2wks	782 ± 135	552 ± 133
9) Vapam 50 gal/A	1112 ± 269 a	552 ± 71

Table 8. Russet Burbank potato tuber rating due to Corky Ringspot Corky damage (TRV is transmitted by *Paratrichodorus allius*) from Vydate treated field plots, Pear Acres Unit, WSU-IAREC, Prosser, WA, 2004.

Treatments	Tuber rating	% Infection
1) Control	0.45 ± 0.1	38 ± 7.8
2) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2wks + 2wks + 2 wks + 2wks	0.04 ± 0.04 a	4 ± 4 a
3) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2 wks + 2wks + 2wks	0.05 ± 0.03 a	7 ± 3 a
4) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence +2 wks + 2wks	0.03 ± 0.03 a	3 ± 3 a
5) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks +2 wks	0.01 ± 0.01 a	1 ± 1 a
6) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks	0.06 ± 0.02 a	6 ± 2 a
7) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks	0.09 ± 0.04 a	9 ± 5 a
8) Vapam 50 gal/A + Vydate 1.0 lb/A 2 weeks after emergence + 2 wks + 2wks	0.12 ± 0.07 a	11 ± 7 a
9) Vapam 50 gal/A	0.12 ± 0.03 a	12 ± 3 a

Tuber rating: 0= none; 1= slight 10%; 2= moderate 25%; 3= heavy 50%; 4= severe 75%

Table 9. Tuber yields (lb/plot) of Russet Burbank potato treated with Vydate against *Paratrichodorus allius* plots, Pear Acres Unit, WSU-IAREC, Prosser, WA. 2004

Treatments	#1	#2	# Culls	Total yield (pounds)
1) Control	6377 ± 128	540 ± 20	232 ± 12	7149
2) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2wks + 2wks + 2 wks + 2wks	7823 ± 137	964 ± 47	337 ± 14	9124
3) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence + 2 wks + 2wks + 2wks	7174 ± 309	640 ± 37	381 ± 26	8195
4) Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence +2 wks + 2wks	8648 ± 132	1171 ± 48 a	224 ± 14	10043
5) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks +2 wks	7984 ± 114	1346 ± 44 a	639 ± 33 a	9969
6) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks	8354 ± 44	976 ± 12 a	389 ± 32	13226 a
7) Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks	9091 ± 121 a	860 ± 19 a	306 ± 26	10257
8) Vapam 50 gal/A + Vydate 1.0 lb/A 2 weeks after emergence + 2 wks + 2wks	8615 ± 262	514 ± 32	290 ± 33	9419
9) Vapam 50 gal/A	9783 ± 182 a	333 ± 30	153 ± 7	10269

* Total yield includes data from #1, #2 potatoes and culls.

CONCLUSIONS

Values are means of five replicates. Values (± Standard Error) in each column followed by a letter differ at $P < 0.05$ from the control, according to student t-test.

The following treatment yielded significantly more tubers than the control: **6)** Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks. The following treatments yielded more tubers than the control, the treatments show trends but are not significantly different: **4)** Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence +2 wks + 2wks, **7)** Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks, **9)** Vapam 50 gal/A

Although the yields were not significantly different in the rest of the Vydate treatments in comparison to the untreated controls, the treatments were able to protect the potato tubers i.e. less Corky Ringspot damage.

In terms of tuber rating and % infection, all treatments protected the tubers against Tobacco Rattle Virus in comparison to the control. Furthermore, the following treatments had the lowest % infection: **4)** Vapam 50 gal/A + Vydate 1.0 lb/A in furrow + Vydate 1.0lb/A at emergence +2 wks + 2wks; **5)** Vapam 50 gal/A + Vydate 1.0 lb/A at emergence + 2 wks + 2 wks + 2 wks +2 wks

Note that our rating system is approximately twice as strict as inspectors in the potato processing plants.

NEW NEMATODE SPECIES FOUND IN COLUMBIA BASIN OF THREAT TO POTATOES:

The root lesion nematode, *Pratylenchus penetrans* is a common pathogen of potato in the United States east of the Rocky Mountains and frequently interacts with *Verticillium dahliae* to aggravate early dying disease. West of the Rocky Mountains, *P. penetrans* is associated with numerous crops including mint, tree and small fruits, but is rarely recovered from potato fields. *Pratylenchus neglectus* is a common plant-parasitic nematode on potato in the west, but causes little loss in yield and does not usually interact with *V. dahliae*. Management of *P. neglectus* is generally unnecessary. During May of 2003 (six weeks after planting), large areas of stunted plants, were observed in field inspections and aerial photographs in two fields of Ranger Russet in Benton Co., WA. Lower roots and stolons had numerous dark lesions typical of *P. penetrans* damage and were severely stunted while long, white roots had formed abnormally near the soil surface. In early May 2003, lesion nematodes (65 in 250 g dry soil and 810/g fresh root weight) recovered from these potato fields were identified as *P. penetrans* based on morphological characters. The crop responded to Vydate but the yields were 4 tons/acre less than in comparable unaffected fields. This is the first report of severe damage to potato from *P. penetrans* in the Columbia Basin potato production area. Soil fumigation with Telone II is commonly used in the Columbia Basin to control root-knot and stubby-root nematodes and metam sodium is used to control *V. dahliae*. However, since the only nematode recovered from preplant samples was assumed to be *Pratylenchus neglectus*, and because Ranger Russet is relatively tolerant to *V. dahliae*, no fumigant was used in these fields. Mint production and apple orchards in this area may be responsible for introducing *P. penetrans* into previously uninfested fields. Identification of *P. penetrans* in stunted corn from two nearby fields during 2004 suggests that this nematode may be a new and emerging problem in this area. The Columbia Basin is one of the largest potato-producing regions in the United States and widespread introduction of *P. penetrans* could add substantial cost to potato production in this area.

In addition to the lesion nematode a second nematode has been found in the Columbia basin. This nematode, *Paratrichodorus teres*, is also a stubby root nematode and it is related to *P. allius*. Both nematodes vector Tobacco Rattle Virus to potatoes causing Corky Ringspot disease. The distribution of *P. teres* is not known at present.