Potato Progress

Research and Extension for Washington's Potato Industry
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Checklist for Managing Late Blight Infected Tubers in Storage

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Late blight was present this growing season throughout the Columbia Basin. Infected tubers are inevitably being harvested and placed in some storages. Following is a checklist for managing potatoes in storage that may contain late blight infected tubers. These suggestions also apply for pink rot and Pythium leak. Additional information can be found at http://classes.plantpath.wsu.edu/dajohn.

1. Continue late blight fungicide applications until harvest or until all vines are dead.
2. Harvest only during dry weather.
3. Harvest when tuber pulp temperature is 45-65F.
4. Store known infected tuber lots separate from non-infected lots.

5. Store known infected tuber lots where they can be easily obtained for processing.
6. Sort for rot going into storage -Provide sufficient light and people to do the job.
7. Provide adequate air flow throughout the storage (25 cfm/ton).
8. Cool and dry the tubers as quickly as possible.

9. Cure tubers at the lowest temperature possible (50F) or eliminate the curing period, depending on the amount of rot.
10. Cool the pile to the final storage temperature as quickly as possible - about 42F for table stock, 45F for French fry processing and 50F for potato chips. It may be necessary to cool and hold tubers for processing and chips below the typically recommended temperatures.
11. Do not humidify.
12. Run fans continuously. Recirculate air through the tubers at all times, even when outside air is not being introduced.

13. Keep piles shallow to promote air movement and removal of hot spots.
14. Monitor storages daily. Determine temperature of the piles at various depths and locations. Serious late blight problems usually show up with 6 weeks of storage.
15. Do not expose cold tubers to outside air and any tubers to air at or below freezing.

16. Tubers of Alturas and Umatilla are moderately resistant, and tubers of Defender are resistant. Storage problems with these cultivars should be less than with other cultivars. However, good air movement and temperature and humidity management will be needed when storing infected tubers of all cultivars.

Using Cultural Practices to Reduce Tuber Damage by the Potato Tuberworm: Pesticide Timing Trials

S. I. Rondon, Oregon State University, Hermiston Agricultural Research and Extension Center

The potato tuberworm is a cosmopolitan, oligophagous pest of solanaceous crops around the world. It was first detected in Umatilla County, Oregon, in 2002. In the Columbia Basin, potato tuberworm adults emerge as early as April and they continue to threaten the crop through November. It is a highly adaptable insect found in locations with very different conditions. Grade standards for processing potatoes allow a cumulative 5% serious damage for all causes, internal and external, including insect damage. U.S. Commercial grade for fresh potatoes permits 8% serious damage, with no 5% internal or 5% external defects. Both standards have zero tolerance for the presence of live larvae in the tuber. When combined with other defects, a relatively low percentage of tubers with tuberworm damage may be enough to result in rejection of an entire field.

Field trials were initiated in 2004 at the Oregon State University Hermiston Agricultural Research and Extension Center to evaluate the potential to reduce potato tuberworm damage through cultural practices, including timing of pesticide application programs, application of post vine-kill irrigation with and without chemical desiccation, rate of vine-kill through use of various desiccants with and without insecticide application, and vine-kill practices. This short communication summarizes the pesticide timing trial only.

Pesticide Timing Trials

Lannate LV (methomyl), Asana (esfenvalerate), and Avaunt (indoxacarb) were evaluated for their ability to control potato tuberworm in Russet Burbanks potato when applied at or after vinekill. Lannate at 3.51 liters/ha and Avaunt at 0.44 liters/ha were applied in 0.28-cm irrigation water with an overhead chemigation system immediately before vines were desiccated with Diquat (diquat dibromide). Asana was applied with a tractor boom sprayer at 0.44 liters/ha in 234 liters/ha water, also just before vine-kill. The Asana treatment was followed 1 wk later by application of Lannate as described previously.

Application rates and timing were suggested by the product manufacturers' representatives. Eleven days after the Asana/Lannate combination treatment, 100 tubers were harvested from the center two rows of each four-row 15-m plot and stored for 3 wk at ambient temperature. Tubers were hand-peeled and evaluated for the presence or absence of tuberworm damage.

How soon before vine-kill a potato tuberworm program should be implemented? Asana, Monitor 4 (methamidophos), and Lannate LV were applied according to product label recommendations at 7 or 5-d intervals, beginning 28, 21, 14, and 7d (Asana, Monitor) or 25, 20, 15, 10 and 5d (Lannate) before and at vine-kill in 2005 (Table 1, Trial 1). Insecticide treatments were applied in 187 liters/ha with a tractor-mounted boom sprayer. Enquik (monocarbamide dihydrogen sulfate) vine desiccant was applied similarly at 187 liters/ha in 374 liters/ha water. The trial in 2006 followed similar methods, except that Lannate was applied on 7 d intervals. One hundred tubers in the center portion of the innermost two rows of each plot were sampled at 14 or at 1 and 15 d after desiccation in 2005 and 2006, respectively.

A second trial was conducted in 2005 in which all treatments were applied in 0.38 cm of water with a chemigation simulator. Asana and Avaunt at two rates, and a combination of the two insecticides were applied weekly beginning 4 wk before and at vine-kill (Table 1, trial 2). In addition, Avaunt was applied at two rates at vine-kill and 1 wk later.

Table 1. Potato tuberworm insecticide timing trials, 2005-2006, Hermiston, OR.

Timing and treatments	Rate (liters/ha)	Interval (days)	Applications (no.)
Trial 1[a] (Tractor-applied)			
Pre vine-kill			
Asana (esfenvalerate)	0.55	7	2-5
Lannate LV (methomyl)[1]	2.63	5	2-6
Monitor 4 (methamidophos)	2.05	7	2-5
Trial 2[b] (Chemigated)			
Pre vine-kill[b]			
Asana	0.29	7	5
Asana	0.58	7	5
Avaunt (indoxacarb)	0.22	7	5
Avaunt	0.37	7	5
Asana + Avaunt	0.29+0.22	7	5
At and post vine-kill			
Avaunt (indoxacarb)	0.22	7	2
Avaunt	0.37	7	2

a Applications beginning 28, 21, 14, or 7 d (Asana, Monitor) or 25, 20, 15, 10, or 5 d (Lannate) before vine-kill in 2005 and beginning 28, 21, 14, or 7 d before vine-kill in 2006.
b The 2005 only; *c* Weekly applications beginning 28, 21, 14, or 7 d before and at vine-kill.

In 2004, the three insecticide treatments significantly reduced tuberworm damage from 8.0% for the untreated control to 3.25, 2.00, and 2.50% for the Asana followed by Lannate, Avaunt, and Lannate treatments, respectively . There was no difference between the three insecticide treatments. In trial 1 in

2005, all insecticide treatments significantly reduced tuber damage at 2 wk after vine-kill compared with the control. Time of initiation of treatment before vine-kill did not affect tuberworm damage. In the second trial in 2005, the four pre vine-kill single product treatments applied weekly beginning 4 wk before vine-kill did not provide control; only the combination Avaunt/Asana treatment was effective,reducing damage from 5.25% for the control to 0.75%. Avaunt applied at desiccation and 1 wk later significantly reduced tuber damage from 5.25% in the untreated control to 1.5 and 1.25% for the 0.22 and 0.37 liters/ha rates, respectively. Damage did not differ between the two application rates.

In summary, the insecticide timing trials demonstrated that weekly application beginning 4 wk before vine-kill was no more effective than a single application one week before and at vine-kill. Most products tested were effective. Also, application of some insecticides at and after vine-kill can significantly reduce tuberworm damage. Tuber damage can increase if tubers are left unprotected in the field after vine-kill, so immediate harvest is recommended.

For more information: Clough, G.H., S.I. Rondon, S.J. DeBano, N. David, and P.B. Hamm. 2010. Cultural practices to control the potato tuberworm. J. Econ. Entomol. 103(4): 1306-1311 (http://www.entsoc.org/Pubs/Periodicals/JEE/index.htm) or contact Silvia Rondon for a full copy of the research paper (silvia.rondon@oregonstate.edu).

WSPC Research Review Process and Meeting Dates Finalized

The potato commission is about to embark on another fall and winter of hard work on reviewing and planning it's research program. All documents describing the process are posted on the website:

www.potatoes.com/research.cfm

Below are a couple excerpts. Check the website for all the details!

Goals (of the research review and planning process)

1. Build communication, cooperation, and understanding among the commission, other industry members, and the scientific community.
2. Develop an overall research program that is a collaboration between industry and scientists and their institutions aimed to maintain or improve profitability of Washington potato growers.
3. Form strong cooperation among the Pacific Northwest potato commissions and scientists to achieve maximum benefit from all research dollars in the region.

2010-2011 Review and Reporting Schedule

1. **October:** Meetings of subject-matter committees.

Plant Protection: October 27, 9:00 am - 4:00 pm, WSPC Office, Moses Lake
Crop Management: October 28, 8:30 - 10:30 am, WSPC Office, Moses Lake
Variety Development/Breeding: October 28, 10:45 - 12:00 noon, WSPC Office, Moses Lake
Economic, Sustainable, and Value-Added Research:** October 28, 12:45 pm - 3:00 pm, WSPC Office, Moses Lake

4. **February:** Research results and proposals presentations.

February 15 - 16, 2011, Pasco.