

Volunteer Potato Outlook.
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Winter soil temperatures recorded at the USDA-ARS research site near Paterson, WA indicate that soil temperatures of 26⁰ F on December 16 killed tubers above 3 inches deep. During the period December 14-22 soil temperatures at Othello were low enough to kill tubers above 7 inches deep. Potato tubers are normally killed when they reach temperatures $\leq 28^{\circ}$ F. Cold air temperatures prevailed in the Basin from December 14-26, but snow fall around December 17 at Paterson and December 22 at Othello prevented killing temperatures from progressing deeper and increasing tuber mortality. Data from the Agrimet weather station in Odessa, WA indicated that lowest soil temperatures occurred on December 20 and tubers above 7 inches deep likely froze depending on local snow cover.

If these data are representative of local fields, growers in the south Columbia Basin will likely have significant volunteer potato problems in 2009. Volunteer potatoes in the Othello area and further north in the Columbia Basin likely experienced killing temperatures at deeper depths and those potatoes that do emerge in the spring should be from lower depths and somewhat delayed.

For more information on volunteer potato control visit the Prosser USDA-ARS website at; <http://www.ars.usda.gov/pwa/prosser>

Recommendations for Volunteer Potato Control:

Growers should minimize the number of tubers left in the field during potato harvest (Steiner et al., EB1993). Newberry and Thornton (2004) demonstrated that deep fall tillage (mold board plow) that buries tubers deeper prior to cold winter temperatures should be avoided. Previous studies comparing tillage practices indicated that plowing **following** a deep penetrating frost could be beneficial by exposing deeper buried tubers to additional freezing events (Thomas and Smith, 1983). However, weather patterns are not always conducive to make this practice effective and field access in winter months is often limited.

Control measures should strive to minimize competition with rotational crops and formation of new daughter tubers that can persist and cause problems in subsequent crops. Several components of volunteer potato management that growers can implement in this year's rotational crops are listed below.

- On higher value crops with nematode problems such as carrot or onions, spring fumigate with metham sodium (Vapam, Busan, and others) and 1, 3,- dichloropropene (Telone II). Field studies indicate about 70 to 75% of tubers are killed by a combination of Telone II at 10 GPA applied with shanks plus Vapam at 30 GPA applied by center pivot. Lower rates of fumigants are less

effective in killing tubers. Follow labels for proper rates, soil temperatures, soil moisture, and time required between fumigation and planting of subsequent crop.

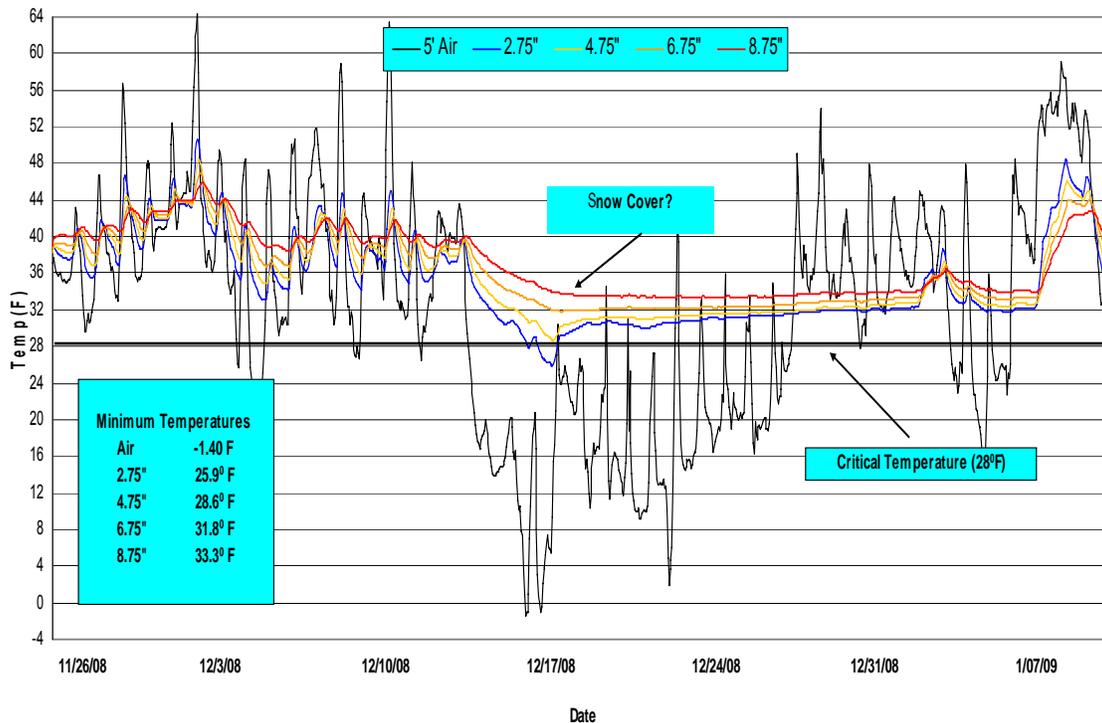
- If possible, delay planting of the rotation crop to allow maximum early volunteer potato emergence and apply glyphosate (Roundup) or remove with tillage. If planting glyphosate resistant crops, wait to apply glyphosate until the majority of the volunteer potatoes have emerged and are just beginning to initiate tubers.
- Maleic hydrazide applied to the potato crop can significantly reduce volunteer potato sprouting the following year. Check with processor before using.
- Use herbicides that are active in reducing volunteer potatoes in rotation crops. Several herbicides can be very effective in killing potato plants and reducing daughter tuber weight, including mesotrione (Callisto), fluroxypyr (Starane), atrazine (Aatrex, Atrazine), glyphosate (Roundup), dicamba + diflufenzopyr (Distinct), dicamba (Banvel, Clarity), and imazamox (Raptor). Ethofumesate (Nortron) applied preemergence retards potato emergence and applied postemergence can reduce potato competition with the crop. Repeated applications of contact herbicides such as, oxyfluorfen (Goal), carfentrazone (Aim), fomesafen (Reflex), glufosinate (Rely), and paraquat (Gramoxone) can also be effective. Follow labels closely for labeled crops, proper rates, timing of applications, and crop rotation restrictions.
- When possible, apply postemergence herbicides when potatoes are just beginning to initiate tubers on stolons. If applications are made earlier, mother tubers often resprout and the volunteer plants will require additional herbicide applications. If applications are made later, yield loss may have already occurred and many new tubers will have already formed which will infest next year's crop.
- Previous USDA-ARS research demonstrated that cultivation about 1 week after postemergence applications of Starane, Goal, Roundup, and Banvel greatly reduced the number of daughter tubers formed compared to herbicides alone. In corn, Callisto herbicide has reduced new daughter tuber formation greater than other postemergence herbicides. Cultivation after Callisto application may not improve volunteer potato control.
- Select competitive crops and those with effective herbicide and cultivation options like field corn. Crops like carrots have few effective herbicides registered for volunteer potato control, so avoid planting such crops in fields where volunteers will be plentiful. Winter wheat is a very competitive crop and delays volunteer potato emergence in the spring. However, cultivation isn't practical in wheat and there are limited opportunities for timing effective herbicide applications in winter wheat prior to new tuber set on volunteer potatoes.
- Repeated cultivations and hand weeding can control volunteer potatoes, but they are most effective and economical when combined with other control methods.
- Grazing fields with hogs, sheep, or cattle may also reduce the number of tubers available to sprout.

For more detailed control information contact Rick Boydston, USDA-ARS, 24106 N Bunn Road, Prosser, WA 99350. Phone (509) 786-9267. Email: rick.boydston@ars.ars.usda.gov

References.

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- Steiner, C. M., G. Newberry, R. Boydston, J. Yenish, and R. Thornton. Volunteer potato management in the Pacific Northwest rotational crops. Washington State University Extension Publications, EB1993, 12 pp. 2005. (ARIS 185602)
- Thomas, PE and DR Smith. 1983. Relationship between cultural practices and the occurrence of volunteer potatoes in the Columbia Basin in northwest United States. Amer Potato J 60:289-294.

Paterson Soil Temperature
11/26/08 to 1/09/09



Othello Soil Temperature
12/1/08 to 1/20/09

