Volunteer Management in Potatoes

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"Volunteer potatoes" are potatoes that remain in the field following harvest or crop abandonment that regrow the following year in another crop. Not only can volunteers act as a weed to rob nutrients from the next crop, thereby reducing yields, but they are also a source of inoculum for a wide range of important potato diseases, such as late blight, bacterial ring rot (BRR), blackleg and other soft rot diseases, and potato viruses.

Previous research has determined that **tubers freeze when exposed to -2° C for 50 hours or -10° C for 25 hours.** If there is sufficient frost in the ground penetrating at least 12 in (30 cm) in the soil, this will eliminate most potential volunteers. However, in winters with significant snowfall before ground freeze, this can insulate the soil and prevent the penetration of frost in the soil profile, increasing the risk for volunteers.

Volunteer potatoes, already at tuber initiation stage in early June in forage field.

Management Options:

Tillage:

- Fall tillage to maximize the number of **tubers at or near the soil surface** will increase the likelihood that tubers will freeze.
- **Use disc harrows or non-inversion tillage equipment**. Moldboard plowing will bury tubers deeper in the soil profile, increasing the likelihood of tuber survival.
- Spring tillage may also be an option ahead of planting the next crop, especially if potato plants are already emerged and growing.

Crop Rotation:

- Follow potatoes with **competitive crops** such as winter wheat, barley, and canola.
- **Grass/legume crops** harvested for forage or grazed can also reduce volunteer viability.
- Use of **Round-Up Ready varieties or corn and soybean** enable use of glyphosate on potatoes while not negatively impacting the current crop.

Other Mechanical Control:

- If volunteer numbers are low or concentrated in small areas of a field, **removal by hand** can be a cost-effective and highly effective control method.
- **Cull potatoes** should be spread evenly on the soil surface or mechanically destroyed (snow blower, pulper) prior to winter to increase the likelihood of tubers freezing.

Herbicides:

- **Glyphosate** has proven to be the most effective option, as it not only slows down or kills above ground foliage, but it also translocates into daughter tubers, making them much less likely to regrow the following year. Full label rate is recommended. This will rarely provide 100% control, as tuber reserves are sufficient for plant to regrow.
- **Callisto** (Mesotrione, labelled for use in corn, sudangrass, pearl millet) mixed with atrazine can be effective.
- **Dicamba** products have also proven successful. Consult the product label for approved crops and rates.
- University of Idaho study found three applications of **burn-down products like glufosinate or diquat** was effective in eliminating 95% of shoot growth after exhausting reserves of mother tuber. (Hutchinson, 2021)
- **Maleic hydrazide (MH)** applied in-season on the potato crop for sprout inhibition can also reduce volunteer growth.

Sources: Dr. Pam Hutchinson, University of Idaho; Dr. Andy Robinson, NDSU/University of Minnesota; Gavin Graham, NBDAAF; Dr. I Kutay Ozturk, University of Maine