

Volunteer potato control recommendations for 2020

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Volunteer potatoes can grow from tubers left in the field after harvest the prior fall. Even if fall tillage buries these tubers, temperatures low enough to render them non-viable, 25 F in dry soil, may not occur deep enough in the soil profile aka “Kill Zone”... *surprising for Idaho Washington, and Oregon!* In addition, snow cover may even prevent freezing of the soil surface.

Timing:

- ***Optimum postemergence herbicide application time to volunteer potato is at tuber initiation*** (tuber initiation is when the tip of the stolon (underground stem) starts to swell to form a new potato tuber).

NOTE: Volunteer potato tuber initiation may have already started in your area, however, the recommendations below might still kill the plants and possibly prevent tuber maturity. Read and follow the labels.

An excellent article about a Michigan State University volunteer potato control study in corn was recently published in Potato Grower:

“**Options for Controlling Volunteer Potatoes.**” Potato Grower Published online: Apr 02, 2020 by Erin Burns & Chris Long.

<https://www.potatogrower.com/2020/04/options-for-controlling-volunteer-potatoes>

Source: Michigan State University Extension

<https://www.canr.msu.edu/news/options-for-controlling-volunteer-potatoes>

From the article/study results and regardless of treatment used “...as the size of volunteer potatoes increased, control decreased. When applications were made to small volunteers (less than 6 inches), 60% of treatments resulted in one or no daughter tubers produced per plant. When applications were made to medium (6-12 inches) or tall (more than 12 inches), only 25% and 0% of treatments resulted in one or no daughter tubers produced per plant.”

Preventative measures can go a long way for avoiding the problem in the first place. *However, right now the issue is killing the volunteer potatoes already in the field.*

The following two photos are of volunteer potatoes in a sugar beet field. The tuber remaining after the prior year potato harvest is only golf ball size but has produced a healthy 6 inch tall plant. Tuber initiation has started (circled in the 2nd photo), therefore, if not killed ASAP, this plant will produce tubers that can result in volunteer potatoes the following season or beyond.



New sprouts/plants can emerge after herbicide application(s), so monitor fields closely after application in order to continue an effective control strategy.

Volunteer potato control methods for spring/early summer 2020:

- Herbicide application.
- Cultivation.
 - Repeated cultivations and hand weeding can control volunteer potatoes, but are most effective and economical when combined with other control methods.
 - Two or more cultivations are required to reduce volunteer potato tuber production by more than 50% but cultivation does not control potatoes in the crop row.
 - Research has shown that cultivating four times during the season beginning when volunteer potatoes were at the 6 to 8 leaf stage and hooking, and repeating each time potatoes regrew to this stage, reduced potato competitiveness and nearly eliminated production of new tubers.
- Combination of herbicide and cultivation (examples are given below).

A healthy crop is more competitive than a crop with nutrient, water, pest, etc. issues.

Goal:

- Kill emerged volunteer potato plants.
- Prevent volunteer potatoes from re-sprouting.
 - Volunteer potatoes have a large carbohydrate reserve in the tuber and can re-sprout even after the foliage has been destroyed.
- Prevent the volunteer plant (**mother**) from producing new tubers (**daughter tubers**) which can become a problem in next year's crop.
- Reduce weight of daughter tubers if they are already being produced by control time.
- Depending upon the herbicide used, possible translocation to the tuber just being initiated which is a sink for photosynthates, and hence, a chance for the herbicide to also go to the daughter tuber and kill = no longer can sprout.

- If the herbicide application occurs earlier than tuber initiation, then the original volunteer potato tuber (**mother tuber**) may re-sprout.
- Herbicide application later than tuber initiation is usually too late because daughter tubers which have already formed by spraying time can survive and produce volunteer potato plants in the following year's crop.
- If volunteer potato plants are sprayed too late, in addition to competition which has already occurred, the mother plant with the developing daughter tubers is competing with the crop for water and nutrients even more now than before daughter tuber production began.
 - University of Idaho research results: when glyphosate application did not occur until after daughter tubers were developing, the potato plant was killed, however, sugar beet yields were reduced due to the extended competition.
 - According to Oregon State University researchers, delayed control measures in onion can also affect yield, especially since the potato plant canopy will shade over the onions.

Herbicides:

This herbicide list is not complete. Herbicides listed for use in some crops may also be labeled for use in other crops. Most labels state "suppression" not control of volunteer potatoes. Rates are not always given for herbicides listed.

Unless noted, application timing is postemergence (after the volunteer potato has emerged).

Read and follow labels closely for labeled crops, proper rates, timing of applications, crop growth stage, adjuvant recommendations, and crop rotation restrictions.

Trade names are used to simplify information – no endorsement of discrimination is intended.

General herbicide information:

- Sulfonylureas, such as Harmony, can injure volunteer potato vegetation but usually aren't effective at preventing re-sprouting and daughter tuber production.
- *Repeated* applications of contact (burndown) herbicides such as, oxyfluorfen (Goal), carfentrazone (Aim), fomesafen (Reflex), glufosinate (Rely), or paraquat (Gramoxone) can be effective at killing the plant above-ground, however, the mother tuber could keep re-sprouting.
- Cultivation 7 to 10 days after postemergence applications of Starane (fluroxypyr), oxyfluorfen (Goal and others), glyphosate (Roundup and others), and/or dicamba (Banvel, Clarity, and others) has been shown to significantly reduce the number of tubers (daughter tubers) produced by the volunteer potato plant (mother plant) compared to herbicides alone.
- Some crops have labels for use of burndown herbicides such as paraquat, carfentrazone (Aim), or glyphosate (Roundup and others) after planting but before crop emergence.
 - If the volunteer potatoes have not reached the tuber initiation stage, then control measures at this time most likely will not be effective.
- There are pre-mix products (more than one herbicide in the container) which might be labeled for volunteer potato control.

A partial list of the 82 herbicides shown on the Idaho State Department of Agriculture website labeled for control of volunteer potatoes.

https://www.kellysolutions.com/ID/showproductsbypest.asp?Pest_ID=PEWAIBL01

Idaho State Department of Agriculture: Partial list of the 82 herbicides that are labeled in Idaho for control of volunteer potatoes in various crops.	
ACURON HERBICIDE	HARNESS MAX HERBICIDE
CALLISTO GT	LAUDIS HERBICIDE
CALLISTO HERBICIDE	MESOTRIONE 4SC
CALLISTO XTRA	NORTRON SC HERBICIDE
DIFLEXX DUO	STALWART 2W
DISTINCT HERBICIDE	STARANE ULTRA
DREXEL MESOTRYONE 4L	STATUS HERBICIDE
ETHOFUMESATE 4SC	WIDEMATCH

Roundup Ready Crops

Glyphosate (Roundup) is an option. As mentioned, the most effective application time is when the volunteer potato plant is at the tuber initiation phase.

Corn

Roundup (glyphosate) in Roundup Ready corn – most effective if applied when volunteer potatoes are at the tuber initiation stage.

Callisto 4 SC (mesotrione) can effectively reduce daughter tuber formation at 2 to 3 fl oz/A (with 1 % v/v crop oil concentrate + UAN (32% N) at 2.5% v/v). AMS (ammonium sulfate) can be substituted for the UAN.

- Cultivation after Callisto application may not improve volunteer potato control.

Atrazine (Aatrex, Atrazine, and others). Various rates and adjuvants – see labels.

Laudis (tembotrione) apply 3 fl oz/A with appropriate adjuvants to volunteer potato <6 in tall. Can be tank mixed with atrazine (a minimum of 0.5 lb ai/A) for use in corn.

Excerpt from Figure 3 of the aforementioned Potato Grower article and Michigan State University Extension website:

“Volunteer potato control 30 days after application...E = Laudis, F= Laudis + Atrazine...” Photos by Erin Burns, MSU.

Within a picture from left to right: application was made to 6 in, 6-12 in, or >12 in volunteer potatoes.



Laudis 3 fl oz/A

Laudis + atrazine (0.5 lb ai/A)

werer

NOTE: Both treatments were applied with 1% MSO + 8.5 lb/100 gal AMS

Impact or Armezon (topramezone):

There are reports that a combination of topramezone (Impact or Armezon) at 1 oz (as per a supplemental label) and atrazine + 1% v/v MSO.

Aim 2 EC (carfentrazone-ethyl) one application alone (0.5 fl oz/A) can kill exposed foliage of potato, but new shoots continued to emerge and reduced corn yield;

Aim 2 EC 0.5 fl oz/A two or three times applied one week apart is more effective than a single application.

Aim 2 EC + dicamba (Banvel, Clarity, or others) (0.5 fl oz + 8 fl oz/A) in a single application at tuber initiation.

Starane 2/3 pt/A (a second application may be needed – do not exceed 1.33 pt/A per year)

NOTE: the Starane ULTRA label states 0.4 pt/A.

Status (diflufenzopyr + dicamba) is a more recently released product than Distinct and includes a safener. The use rate is 2.5 to 10 fl oz/A. Research has shown that 6 fl oz/A early postemergence + 0.4 fl oz/A mid- or late-postemergence (do not exceed 10 fl oz/A per year) may suppress or control volunteer potato in corn.

DiFLexx is a formulation of dicamba with improved safety to corn over some previous dicamba formulations. It can be applied preplant, preemergence, postemergence, and/or as a directed spray. Adjuvant combinations recommended for postemergence applications are crop oil concentrate (COC) or methylated seed oil (MSO) at 1% v/v plus 2 to 4 quarts/A of UAN or AMS at 8.5 to 17 lb/100 gal spray mix.

DiFlexx at 8 to 12 fl oz/A + Roundup (in Roundup Ready Corn) at the appropriate rate and with MSO and UAN as described above, can be effective.

READ AND FOLLOW THE MOST UP-TO-DATE LABELS.

Small grains

Starane Ultra (fluroxypyr) 0.7 pt/A. The label states that application(s) should be made before volunteer potatoes are 8 inches tall.

Aim 2 EC (see corn recommendations)

2,4-D + dicamba: not very effective unless used in a competitive, healthy (wheat) crop. Barley is sensitive to dicamba so it is not recommended for use in this crop.

Roundup pre-harvest would most likely be too late to prevent daughter tuber production, however, translocation to the daughter tuber during bulking phase could prevent daughter tubers from sprouting the following year (ala glyphosate drift onto a seed potato crop).

Sugar beet

Roundup in Roundup Ready sugar beet. Most effective application timing is when volunteer potatoes are at the tuber initiation stage.

Nortron (ethofumesate): A preemergence application can slow volunteer potato emergence; suppression of volunteer potato when applied postemergence might occur, however, this herbicide does not effectively control volunteer potato.

clopyralid (Stinger, Curtail, and others)

Dry bean

Control in dry bean is mostly limited to hand removal once tuber initiation has occurred or possibly a wiper or wick application of glyphosate.

Raptor 1SC (imazamox) and/or Basagran 4L (bentazon) do not effectively control volunteer potato in dry bean.

NOTE: Since dry bean is usually planted later than others in southern Idaho, volunteer potato could already be present in the field so there may be an opportunity to implement various control measures before planting. However, if tuber initiation has not begun at this time, then effective control might not be possible.

Onions

The herbicides listed here for volunteer potato in onion may suppress volunteer potato but most likely will not provide effective control.

oxyfluorfen (Goal and others) – 2 to 3 applications.

NOTE: spray coverage with oxyfluorfen is important – use the appropriate spray gallonage/pressure.

oxyfluorfen + bromoxynil – 2 to 3 applications.

Starane Ultra can be applied at 0.35 pt/A to 4 to 6 inch tall onion, only.

Alfalfa

Raptor (imazamox).

Pursuit (imazethapyr).

2,4-DB.

These alfalfa herbicides can stunt the volunteer potato plants and alfalfa cuttings can further weaken those plants.

Colorado potato beetle are known to be attracted to potatoes that are chemically and physically stressed.

Information included in this list has been gathered from a number of publications and resources including those by Rick A. Boydston, Agronomist, USDA-ARS, Pullman, WA; Don W. Morishita, Professor, Extension Weed Specialist, Superintendent Kimberly R&E Center, University of Idaho; Joel Felix, Associate Professor, Weed Scientist, Malheur Agricultural Experiment Station, Oregon State University; *and from* Colorado State University, Michigan State University, University of Wisconsin, and University of Nebraska.

For further information, refer to the 2005 Washington extension bulletin which includes extensive information on volunteer potato persistence in soil, winter survival, and biology, as well as preventative, cultural, mechanical, chemical, and biological control measures for volunteer potato: *Steiner, C.M., G. Newberry, R. Boydston, J. Yenish, and R. Thornton. 2005. EB1993: Volunteer Potato Management in the Pacific Northwest Rotational Crops. 12 p. Washington State University and USDA.*

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