

# Outlook Herbicide for Weed Control in Potatoes

by Pamela J.S. Hutchinson

Outlook (dimethenamid-p), a chloroacetamide herbicide registered for use in potatoes in 2005, is the formulated active isomer of the herbicide Frontier (dimethenamid). It is in the same chemical family as two other potato herbicides, Dual Magnum (s-metolachlor) and Stalwart (metolachlor). Outlook also is labeled for use in corn, dry bean, garlic, grain sorghum, horseradish, onion, peanut, perennial grasses grown for seed, shallots, soybean, and sugar beet. When tank-mixed with certain other potato herbicides, Outlook can provide broad-spectrum weed control, including control of hairy nightshade, a troublesome weed in potatoes. This bulletin provides information on the use of Outlook for weed control in potatoes.

## Mode of action

Chloroacetamide herbicides such as Outlook control susceptible weeds by inhibiting the synthesis of very long-chain fatty acids in the plant, thus preventing root and shoot growth. Weed seedlings exposed to soil applications of Outlook die before or shortly after they emerge. Outlook will not control weeds already emerged.

## Use rates and application information

Formulated at 6 pounds active ingredient per gallon, Outlook is applied in potato fields at rates that fall into one of two rate ranges depending upon soil texture:

- 12 to 18 fluid ounces per acre in coarse-textured soils (sand, loamy sand, sandy loam)

- 18 to 21 fluid ounces per acre in medium- or fine-textured soils (sandy clay loam, sandy clay, loam, silt loam, silt or silty clay loam, silty clay, clay loam, clay)

Outlook can be applied preemergence (PRE) by ground, chemigation, or air. Outlook can be impregnated on dry fertilizer and applied PRE. Outlook also can be applied early postemergence (POST) by chemigation only. Outlook POST chemigated applications should be made before potatoes reach the 6-inch growth stage. Read the Outlook labels for POST application local restrictions. *Do not apply Outlook POST by any method other than chemigation.*

Since Outlook will not control emerged weeds, Outlook will provide the most effective weed control when applied and incorporated into the soil prior to weed seed germination. The best time to apply Outlook is shortly after a hilling operation that was performed just before potato emergence. An appropriately timed hilling operation will control most weeds emerged after potato planting and create a clean bed to which the Outlook can be applied.

When applied by ground or air, sprinkler incorporate with 0.33 to 0.67 inches irrigation water within 7 days of application. Use the lower amount for coarse-textured soils and the higher amount for fine-textured soils to incorporate Outlook into the upper soil surface where weed seeds germinate. If adequate rainfall has occurred to incorporate the Outlook to the appropriate soil depth within 7 days of application, then sprinkler incorporation is not necessary.

See table 1 for more application and rate information.

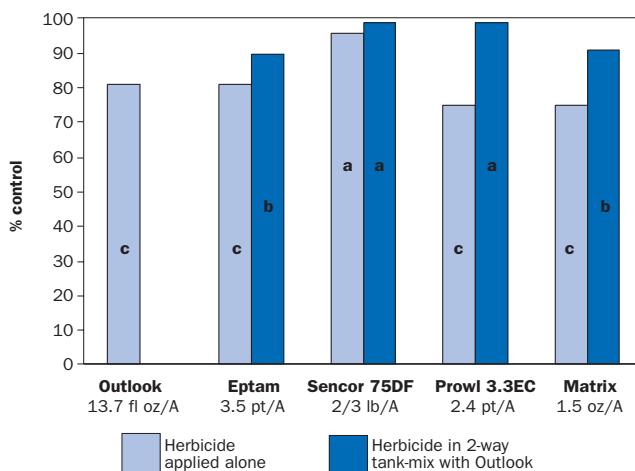
**Table 1. Outlook application recommendations and restrictions.**

Application and incorporation	Recommendations and restrictions
Preemergence (to potatoes and weeds)	<i>Following planting or after dragoff</i>
Application methods	Ground, aerial, chemigation, impregnation on dry fertilizer.
Incorporation after application by ground or air	<ul style="list-style-type: none"> <li>• Sprinkler irrigation to incorporate into upper soil surface where weed seeds germinate if adequate rainfall is not received.</li> <li>• Shallow mechanical incorporation if adequate rainfall or sprinkler irrigation is not received.</li> </ul>
Incorporation time interval	0 to 7 days after application
Chemigation volume	0.33 to 0.67 inches, the lower volume for coarser textured soils and the higher volume for finer textured soils.
Early postemergence	<ul style="list-style-type: none"> <li>• <b>By chemigation only.</b> Make the chemigation application before potatoes reach the 6-inch growth stage. Read the labels for local restrictions.</li> </ul>
Use rate(s) in potatoes for preemergence or early postemergence applications	<ul style="list-style-type: none"> <li>• <b>Coarse-textured soils</b>—12 to 18 fl oz/A (0.56 to 0.84 lb ai/A)</li> <li>• <b>Medium-and fine-textured soils</b>—18 to 21 fl oz/A (0.84 to 0.94 lb ai/A)</li> <li>• Do not exceed the recommended rate by soil type in a single application.</li> <li>• Only apply in a single application.</li> </ul>
Other	<ul style="list-style-type: none"> <li>• <b>Will not control weeds that have emerged from soil.</b></li> <li>• Application must be made to clean-tilled soil or with other herbicides that control emerged weeds.</li> <li>• In cold or wet growing conditions, applications may result in delayed emergence or early season stunting of potatoes.</li> <li>• Application to crops under stress (lack of soil moisture, hail damage, flooding, herbicide injury, mechanical injury, or widely fluctuating temperatures) may result in crop injury.</li> </ul>

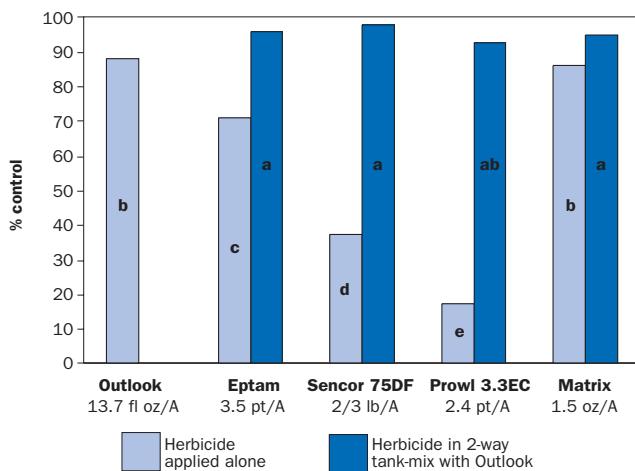
## Weeds controlled

Outlook applied PRE alone provided at least 88% control of hairy nightshade, kochia, redroot pigweed, green foxtail, and volunteer oat in multiple years of University of Idaho weed control research trials. In these trials, Outlook also suppressed common lambsquarters. Tank-mixtures of Outlook with other preemergence potato herbicides such as Eptam (EPTC), Matrix (rimsulfuron), Prowl 3.3 EC/H<sub>2</sub>O (pendimethalin), or Sencor (metribuzin) provided broad-spectrum weed control of most weeds present in potato production fields (figures 1-4).

When targeting weed species listed on the Outlook label as “partially controlled” or “suppressed,” Outlook should be applied in tank-mixtures with other herbicides or followed with a sequential application of herbicides to provide additional control of these weed species.

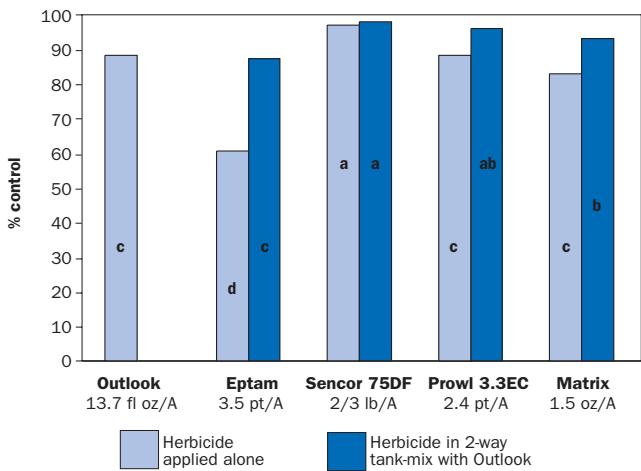


**Figure 1.** Common lambsquarters control with Outlook and other potato herbicides applied alone or with Outlook tank-mixed with the other herbicides and applied preemergence, University of Idaho Aberdeen Research and Extension Center, 2001-03. Treatment mean bars labeled with the same letter are not significantly different according to a Fisher's protected LSD test ( $P=0.05$ ).

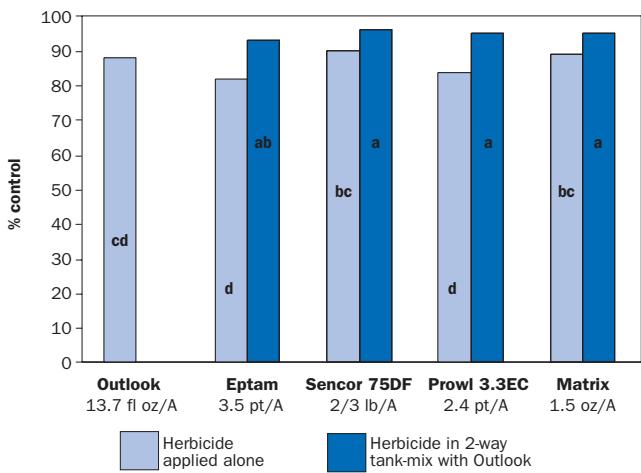


**Figure 2.** Hairy nightshade control with Outlook and other potato herbicides applied alone or with Outlook tank-mixed with the other herbicides and applied pre-emergence, University of Idaho Aberdeen Research and Extension Center, 2001-03. Treatment mean bars labeled with the same letter are not significantly different according to a Fisher's protected LSD test ( $P=0.05$ ).

Weeds controlled or suppressed by Outlook and other potato herbicides that can be used in combination with Outlook are listed in table 2.



**Figure 3.** Kochia control with Outlook and other potato herbicides applied alone or with Outlook tank-mixed with the other herbicides and applied preemergence, University of Idaho Aberdeen Research and Extension Center, 2001-03. Treatment mean bars labeled with the same letter are not significantly different according to a Fisher's protected LSD test ( $P=0.05$ ).



**Figure 4.** Volunteer oat control with Outlook and other potato herbicides applied alone or with Outlook tank-mixed with the other herbicides and applied preemergence, University of Idaho Aberdeen Research and Extension Center, 2001-03. Treatment mean bars labeled with the same letter are not significantly different according to a Fisher's protected LSD test ( $P=0.05$ ).

## Potato variety tolerance and follow-crop restrictions

The potato cultivars Russet Burbank, Ranger Russet, Russet Norkotah, Shepody, Alturas, and Bannock Russet were tolerant to Outlook applied

**Table 2. Weeds controlled or suppressed by Outlook; other potato herbicides that may be used in combination with Outlook.**

### Weeds listed as "controlled" on the label

#### Broadleaves

- amaranth, Palmer
- chamomile, mayweed
- carpetweed
- nightshade<sup>1</sup> (black, eastern black, cutleaf, hairy)
- pigweed (prostrate, redroot, smooth, tumble)
- purslane, common
- spurge, spotted
- waterhemp<sup>1</sup> (common, tall)

#### Grasses

- barnyardgrass
- bluegrass (annual, roughstalk)
- brome (downy, California)
- crabgrass (smooth, large)
- fescue, rattleail
- goosegrass
- panicum, fall
- ryegrass, Italian
- sandbur<sup>1</sup>
- foxtail (green, giant, yellow)
- witchgrass

#### Sedges

- yellow<sup>1</sup>

### Weeds listed as "suppressed" or "partially controlled" on the label

#### Broadleaves

- common lambsquarters
- common ragweed

#### Grasses

- sandbur
- seedling johnsongrass
- Texas panicum
- wild proso millet
- wooly cupgrass

#### Sedges

- none

### Herbicides labeled for use in combination with Outlook<sup>2</sup>

**Preemergence** applications of Outlook may be made prior to, in tank mixtures with, or after the use of one or more of the following registered preemergence herbicides for use in potato:

- metribuzin (Sencor and others)
- Eptam (EPTC)
- glyphosate (Roundup and others)
- Gramoxone Max (paraquat)
- Lorox (linuron) (for use east of the Rocky Mountains, only)
- Matrix ( rimsulfuron)
- Poast (sethoxydim)
- Prowl (pendimethalin)
- Treflan HFP (trifluralin)

Other potato herbicides which may be used in combination with Outlook:

- Chateau
- Spartan

**Early postemergence** (chemigation only) applications of Outlook may be made in tank mixtures only with other potato herbicides registered for early POST chemigation applications in potatoes:

- metribuzin (Sencor and others)
- Eptam (EPTC)
- Matrix ( rimsulfuron)
- Prowl (pendimethalin)

*Tank-mix applications of Outlook early POST may result in increased injury compared with Outlook alone applied early POST.*

<sup>1</sup>For best control of these species, use the highest rate recommended by soil type.

<sup>2</sup>Read and follow the applicable **restrictions and limitations** and **directions for use** on all products involved in tank mixing. The most restrictive labeling applies to tank mixes.

PRE at one and two times a typical use rate in trials at the University of Idaho Aberdeen Research and Extension Center. Tuber yield and quality of all six treated varieties were the same as yield and quality of the same varieties grown in untreated, weed-free plots.

Outlook applications made early POST in potatoes (allowed by chemigation only) may result in leaf malformation, cupping and wrinkling of exposed foliage, and plant stunting. This injury has not been shown to result in yield loss in University of Idaho research trials. Leaves newly emerged after application are not affected. Do not apply Outlook early POST by ground or air because severe damage and significant yield loss can occur.

Other herbicides registered for use in potatoes such as Matrix (rimsulfuron) or Spartan (sulfentrazone) can effectively control hairy nightshade. However, sugar beets, a crop grown in rotation with potatoes in many Idaho production areas, may not be planted the year after use of these herbicides. In contrast, sugar beets may be planted the spring following the previous year's Outlook application in potatoes. The only follow-crop restriction for Outlook is 4 months for fall-seeded cereal crops.

See below for additional information about Outlook for use in potatoes:

Formulation	6 lb ai/gal
Manufacturer/seller	BASF Corporation
EPA registration number	7969-156
States with registration for use in potatoes	All (except for Nassau and Suffolk counties in NY)
Active ingredient/common name	dimethenamid-p
Chemical family	Chloroacetamide
Mode of Action (MOA)	Inhibitor of synthesis of very long-chain fatty acids (VLCFA)
Herbicide MOA group number	15
Other herbicides used in potatoes with same MOA	Dual Magnum (s-metolachlor), Stalwart (metolachlor)

Herbicides with the same MOA used in some common potato cropping systems rotation crops	<ul style="list-style-type: none"> <li>Define (flufenacet)-corn</li> <li>Dual Magnum (s-metolachlor)-corn, grasses grown for seed, pod crops, safflower, sugar beet, sunflower, grain or forage sorghum</li> <li>Frontier (dimethenamid)-corn (field, pop, seed, and sweet), dry bean, grasses grown for seed, grain sorghum</li> <li>Harness/Surpass (acetochlor)-corn (field, seed, silage, pop)</li> <li>Kerb (pronamide)-winter pea, fallow, alfalfa</li> <li>Micro-Tech (alachlor)-corn, grain sorghum, dry bean</li> <li>alachlor (in Lariat with atrazine)-corn, grain sorghum</li> <li>Stalwart (metolachlor)-corn, pod crops, safflower, grain or forage sorghum</li> </ul>
Other crops grown in Pacific Northwest with registration for use of Outlook	<ul style="list-style-type: none"> <li>Corn (field, pop, seed, and sweet), dry bean, garlic, perennial grasses grown for seed, grain sorghum, horseradish, onion, shallots, sugar beet</li> </ul>
Resistance management recommendations included on the label(s)	None
Variety sensitivity	<ul style="list-style-type: none"> <li>None listed on the label.</li> <li>Russet Burbank, Ranger Russet, Russet Norkotah, Shepody, Alturas, Bannock Russet <b>tolerant</b> to 13.7 and 27.4 fl oz/A in University of Idaho trials.</li> </ul>
Replant restrictions in case of potato crop failure after application	<ul style="list-style-type: none"> <li>Only crops labeled for a soil application of Outlook may be planted</li> <li>Replanting potatoes is not recommended.</li> <li>Do not retreat the field with Outlook.</li> </ul>
Rotational restrictions/rotational crop guidelines	<ul style="list-style-type: none"> <li>4 months-fall-seeded cereal crops.</li> <li>Spring following the previous year's application--none listed.</li> </ul>
Restricted-entry interval (REI) after application	12 hours
Preharvest interval (PHI)	• 40 days

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