

Potatoes

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POTATOES—Volunteer Grain, Weed, or Grass Cover Crop Control before Planting Potatoes

carfentrazone (Aim EC)

Rate Up to 0.031 lb ai/A (2 fl oz Aim EC)

Time Apply before potatoes have been planted.

Application methods Ground in a minimum of 10 gal/A or aerial in a minimum of 3 gal/A. Use higher spray volumes when there is a dense weed population or crop canopy. Apply Aim EC with a crop oil concentrate at 1% v/v or a methylated seed oil at a minimum of 1 quart/A or 1% v/v when applied in volumes of more than 20 gal/A.

Remarks Apply to actively growing weeds not more than 4 inches tall or rosettes 3 inches in diameter. Coverage is essential for good control. Tank mixes with other herbicides may increase spectrum of control.

Caution Do not exceed 0.031 lb ai/A (2 fl oz Aim EC) for preplant and/or preemergence burndown treatments. Do not exceed 0.181 lb ai/A (11.6 fl oz Aim EC) total per crop season. This total allowable usage applies to all applications made to the field per calendar year including burndown treatments and harvest-aide.

Tank-Mixtures Tank mixes with other herbicides labeled for preplant burndown applications in potato, such as glyphosate or paraquat, may increase spectrum of control. Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Re-cropping restrictions Following an application of Aim EC, a registered crop may be planted at any time.

Rotational cropping restrictions A field may be rotated to a registered crop at any time after an Aim EC application. All other crops may be planted after 12 mo.

Site of action Group 14: protoporphyrinogen oxidase inhibitor

Chemical family Triazolinone

EPTC (Eptam 7E, 7 lb ai/gal)

Rate 3.5 to 7 pints/A (3 to 6 lb ai/A). For quackgrass control, preplant: 4.5 pints/A (4 lb ai/A). For hairy nightshade, preplant: 7 pints/A (6 lb ai/A).

Time Preplant, preplant application impregnated on dry bulk fertilizer.

Application methods Soil surface must be free of dew and incidental moisture, and dry to at least 0.5 inch deep. Eptam is highly volatile. Incorporate into soil to prevent losing the herbicide. Any cultivation after application should be shallow (i.e., half the depth that the herbicide was incorporated). Whenever possible, apply and incorporate in the same operation. If application and incorporation are separate, Eptam must be incorporated the same day as it is applied.

Preplant: apply and incorporate just before planting.

Incorporation methods Preplant: incorporate 2 to 3 inches deep with power-driven cultivation equipment, or set tandem disks, field cultivators, or rotary-driven or spring-toothed cultivators to cut 4 to 6 inches deep. See label for equipment-specific recommendations. If potatoes are to be hilled after applying, be sure to mix herbicide 3 inches deep or more.

For semiarid areas of eastern Washington, eastern Oregon, and Idaho only: 1) if Eptam is applied preplant and incorporated separately, incorporate the same day as application; 2) apply and incorporate dry bulk fertilizer impregnated with Eptam on the same day; 3) sprinkler-incorporate Eptam immediately after ground application with 0.5 to 0.75 inch water. Application and incorporation must be within 5 days after the last tillage; results will be poor if weeds have germinated.

Remarks Eptam is not effective on emerged weeds.

Caution Do not exceed 14 pints/A (12.25 lb ai/A) per crop year. Preharvest interval is 45 days. Using a Dammer Diker after applying Eptam brings untreated soil to the surface; weed control may be reduced.

Tank-Mixtures Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. Eptam may be applied preplant in a tank-mixture with Treflan HFP. See the registered labels for rates.

Re-cropping restrictions No re-cropping or rotational restrictions for Eptam on label.

Site of action Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family Thiocarbamate

glyphosate (several trade names)

Rate 0.38 to 0.75 lb ae/A for volunteer grains. See labels for specific grains and rates.

Time Apply when annual grain is less than 18 inches tall and before planting potatoes.

Application methods Ground or aerial: apply in 3 to 10 gal/A water by ground or 3 to 5 gal/A water by air. Some glyphosate formulations require using nonionic surfactant; see label for details on additive use. Adding 1 to 2% dry ammonium sulfate (AMS) by weight or 8.5 to 17 lb/100 gal spray mix may increase performance. Also may use the equivalent rate of AMS in a liquid formulation.

Remarks Good growing conditions enhance volunteer grain control with glyphosate.

Caution Glyphosate has no soil-residual activity and will not control weeds emerging after application. Follow all use restrictions and precautions on label.

Tank-Mixtures Tank-mixtures are not stated/approved on most labels. Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling

applies to use of tank-mixtures.

Site of action Group 9: inhibits EPSP synthase

Chemical family None generally accepted

metolachlor (Stalwart, 8 lb ai/gal)

Rate Preplant: 1 to 2 pints/A (1 to 2 lb ai/A). Use lower rate on coarse soils or soils low in organic matter (OM). Use higher rate on soils that are relatively fine or high in OM. Up to 2.75 pints/A can be used on soils with 6% to 20% OM.

Time Preplant: do not apply as a preplant-incorporated and as a preemergence treatment.

Application methods Ground or aerial. Stalwart may be applied impregnated on dry fertilizer.

Incorporation methods Preplant: incorporate into top 2 inches of soil using a finishing disk, harrow, rolling cultivator, or similar implement within 14 days of planting. Evenly distribute herbicide in top 2 inches of soil. Do not damage potato seed pieces or sprouts with incorporation equipment.

Remarks Effectiveness will be reduced if later cultivation exposes untreated soil. If conditions are cool and wet after application, Stalwart may delay maturity and/or reduce yield of Superior and other early-maturing varieties.

Caution Do not use on muck or peat soils.

Tank-Mixtures Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Re-cropping restrictions If a crop treated with Stalwart fails, any Stalwart-labeled crop may be planted immediately. Do not make a second broadcast application of Stalwart. If Stalwart was banded in the failed crop and the second crop is planted in the untreated row middles, a second banded treatment may be applied.

Rotational cropping restrictions Alfalfa may be planted after 4 mo; barley, oats, rye, or wheat may be planted at 4.5 mo; and tomato may be planted 6 mo after Stalwart application. Clover may be planted 8 mo after. Any Stalwart-labeled crop or root crops, tobacco, barley, buckwheat, milo (sorghum), oat, rye, wheat, cabbage, or peppers may be planted the spring after Stalwart applications the previous growing season. All other rotational crops may be planted 12 mo after a layby application. Any Stalwart-labeled crop or tobacco, cabbage, or peppers may be planted the next spring after layby or multiple applications of Stalwart.

Site of action Group 15: inhibits very long chain fatty acid synthesis

Chemical family Chloroacetamide

metribuzin (Sencor DF 75%)

Rate Preplant-incorporated in Idaho only 24 (C) Special Local Needs label ID-870017; 0.67 to 1.33 lb/A (0.5 to 1 lb ai/A)

Time Apply preplant-incorporated as a broadcast spray or impregnated on dry fertilizer.

Application methods Ground, aerial, or impregnated or coated on 500 to 1,200 lb/A dry bulk fertilizer.

Incorporation methods Preplant applications: incorporate evenly 4 to 6 inches deep by double-disking at right angles.

Remarks Sencor may not control triazine-resistant weeds. Refer to the Sencor label for proper rate for soil type, dry bulk fertilizer application information and all other recommendations, cautions, or special precautions that must be followed.

Caution Use only on russeted or white-skin varieties that are not early-maturing. DO NOT use this method on red-skinned varieties or on "Centennial", "Atlantic", "Shepody", "Bellchip", or "Chippelle" varieties, because crop may be injured.

Tank-Mixtures Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Re-cropping restrictions None on label.

Rotational cropping restrictions Do not plant onions, lettuce, cole crops, or cucurbits during the growing season following Sencor applications. Do not plant sugar beets for 18 mo after Sencor application. Certain cereal varieties are sensitive to Sencor (see cereal section of label) and should not be planted during the growing season after Sencor use, unless moldboard plowing deeply enough to mix the upper 8 inches of soil and potato vines left in rows after harvest are uniformly distributed over the soil surface before plowing.

Site of action Group 5: photosystem II inhibitor

Chemical family Triazinone

paraquat (Gramoxone Inteon, 2 lb paraquat cation/gal; or Firestorm, 3 lb paraquat cation/gal)

Rate 1 to 2 pints/A (0.25 to 0.5 lb ae/A) Gramoxone Inteon; or 0.7 to 1.3 pints/A (0.26 to 0.5 lb ae/A) Firestorm for preplant control of other volunteer grains, weeds, or grass cover crops. For volunteer barley control in Idaho, Oregon, and Washington only: use 0.5 to 1 pint/A (0.125 to 0.25 lb ae/A) Gramoxone Inteon; 0.4 to 0.7 pints/A (0.15 to 0.26 lb ae/A) Firestorm to preformed beds before planting potatoes. Do not exceed three applications of Firestorm per year.

Time Apply before planting potatoes. Grass or volunteer cereal grain control is best if applied before tillering or after boot stage.

Application methods Ground or aerial. Add nonionic surfactant with 75% or more surface-active agent at 0.125% v/v (1 pint/100 gal spray mix), or crop oil concentrate at 1% v/v (1 gal/100 gal spray mix) for ground applications, or 1 pint/A for aerial applications.

Remarks Nonselective, postemergence herbicide. Kills most green plant growth on contact, so good spray coverage is essential. Rainfast 0.5 hour after application. Paraquat has no residual soil activity on crops planted later or weeds germinating later.

Caution A restricted-use pesticide. Follow all restrictions and precautions on label. Requires special safety equipment for handling, mixing, and spraying.

Tank-Mixtures Must be applied alone for volunteer barley control. See label for other allowable tank-mix combinations.

Site of action Group 22: photosystem I electron diversion

Chemical family Bipyridilium

S-metolachlor (Dual Magnum, 7.62 lb ai/gal)

Rate Preplant: 1 to 2 pints/A (0.95 to 1.9 lb ai/A), using lower rates on soils that are coarse or low in organic matter. Note: Smetolachlor also is formulated as Dual II Magnum (7.64 lb ai/gal and includes a safener for corn) and as Dual IIG Magnum (16% G). Refer to labels to determine rates, timing, etc. for use in potatoes.

Time Apply preplant-incorporated or preplant-incorporated impregnated on dry bulk fertilizer.

Application methods Ground or aerial.

Incorporation methods Preplant-incorporated: incorporate before planting using a finishing disk, harrow, rolling cultivator, or similar implement that can uniformly incorporate herbicide into top 3 inches of soil.

Remarks If soil is cool and wet after application, Dual Magnum may delay maturity and/or reduce yield of Superior and other early-maturing varieties.

Caution Do not apply both at preplant-incorporated and at preemergence. Do not use on muck or peat soils. Crop may be injured after Dual Magnum if soil moisture is abnormally high during early crop development. Do not harvest within 60 days after the at-planting to preemergence dragoff/after hilling application or within 40 days after a postemergence layby/after final hilling application.

Tank-Mixtures Read and follow the applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Re-cropping restrictions If potato crop fails, corn, soybeans, potatoes, safflower, or other Dual Magnum-registered crops may be replanted immediately. Do not make a second broadcast application.

Rotational cropping restrictions Do not plant barley, oats, rye, or wheat until 4.5 mo after application. Alfalfa may be planted 4 mo after application. Clover may be seeded 9 mo after application. Any crop labeled for Dual Magnum use and pod and root crops, buckwheat, or milo (sorghum) may be planted the spring after treatment.

Site of action Group 15: inhibits very long chain fatty acid synthesis

Chemical family Chloroacetamide

S-metolachlor + glyphosate (Sequence, a formulated premix of 3 lb ai S-metolachlor + 2.25 lb ae/gal glyphosate)

Rate Do not exceed 2.5 pints/A formulated product on coarse soils, 3.75 pints/A formulated product on medium soils with less than 3% organic matter, or 4 pints/A formulated product on fine textured soils with greater than 3% organic matter. Do not exceed 4 pints/A of Sequence per season.

Time Apply before potatoes have been planted. Sequence may be applied up to 30 days before planting.

Application methods Ground in 15 to 40 gal/A or aerial in 3 to 15 gal/A water. Do not apply this product through any type of irrigation system. When foliage is dense,

spray volume should be increased to ensure coverage of the target weeds. Flat-fan nozzles will result in the most effective application. Control of emerged weeds may be improved by adding dry ammonium sulfate at 8.5-17 pounds/100 gallons of water. Liquid formulations of AMS may be used at an equivalent rate.

Remarks Sequence is considered a foliar systemic herbicide which may be applied to control a broad spectrum of emerged weeds and can provide some residual control of certain weeds listed on the label. If rainfall or irrigation is not received within 7 days after application of Sequence, residual weed control may be reduced. Under these conditions, cultivate or use other weed control measures if weeds develop. If emerged at application time, weeds must be actively growing. For best possible annual weed control, apply to weeds 6 inches or less in height. If annual weeds have been mowed or grazed prior to application, wait for 3 to 4 inches of new growth to appear prior to application. When perennial weeds have been mowed or grazed, refer to the label for the recommended stage that new growth should reach prior to application.

Caution Application must be made before crop emergence. Contact with potato foliage will result in crop injury. If cool, wet conditions occur after application, Sequence may delay maturity and/or reduce yield of "Superior" or other early-maturing varieties. Do not harvest within 60 days after application.

Tank-mixtures Sequence can be tank-mixed with Sencor or Prowl for control or suppression of annual and perennial weeds, provided that the tank-mix product label allows use of the product. Refer to the Sequence label for weeds controlled and application rates for these tank mixtures.

Re-cropping restrictions If crop treated with Sequence alone is lost, corn, legume vegetables (succulent or dried), potatoes, sorghum, soybeans, sunflowers, or transplanted tomatoes may be replanted immediately.

Rotational cropping restrictions Do not plant barley, oats, rye, or wheat before 4.5 mo after application; alfalfa 4 mo; tomato 6 mo; or clover 9 mo. Buckwheat, milo (sorghum) cabbage, stone fruits, or tree nuts may also be planted in the spring following treatment.

Site of action Group 15: inhibits very long chain fatty acid synthesis; Group 9: inhibits EPSP synthase

Chemical family Chloroacetamide; none generally accepted

trifluralin (Treflan HFP, 4 lb ai/gal; or others)

Rate Preplant only tank-mixed with Eptam: 1 pint/A (0.5 lb ai/A) on coarse soils; 1.25 to 1.5 pints/A (0.625 to 0.75 lb ai/A) on medium-texture soils; 1.5 pints/A on coarse or medium-texture soils with 2 to 5% organic matter (OM); 1.5 to 2 pints/A (0.75 to 1 lb ai/A) on fine-texture soils; and 2 pints/A on fine-texture soils with 2 to 5% OM. On soils with 5% to 10% OM, use 2 pints/A. In Idaho, Oregon, and Washington, use lower rate in areas receiving less than 20 inches/year total rain and irrigation. Treflan HFP applications may be split on soils with less than 2% OM in Idaho, Oregon, and Washington: 0.75 pint/A before planting + 0.75 pint/A postemergence, when potato plants have fully emerged.

Time Preplant: only tank-mixed with Eptam.

Application methods Ground.

Incorporation methods Mechanically incorporate thoroughly into 2 to 3 inches of soil as soon as possible but no later than 24 hours after application.

Remarks Existing weeds must be destroyed by tillage before applying herbicide, because Treflan HFP does not control established weeds. Weed control may be erratic if cultivation exposes untreated soil between rows.

Caution Strictly adhere to label rates and precautions to prevent crop injury. If cultivation is required after Treflan HFP application, avoid completely covering potato plants with treated soil. If treated soil is concentrated over the potato row/hill, emergence may be slowed and stems can become brittle. Do not apply to wet soils; weed control may be poor.

Tank-Mixtures Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. Preplant: only tank-mixed with Eptam.

Rotational cropping restrictions In Idaho, Oregon, and Washington after a spring application of Treflan HFP, wait at least 12 mo to plant sugar beets, red beets, spinach, corn, sorghum (milo), proso millet, oat, and annual or perennial grass crops or mixtures. Do not plant any of these crops for 18 mo after application in fields that have not been irrigated, or that have been fallowed without irrigation or cultivation. Moldboard plowing 12 inches deep before planting these crops can reduce the possibility of crop injury. Do not plant vegetable crops, other than labeled for preplant application of Treflan HFP, within 5 mo after application.

Site of action Group 3: microtubule assembly inhibitor

Chemical family Dinitroaniline

POTATOES—Annual Grass and Broadleaf Weed Control After Planting Potatoes

carfentrazone (Aim EC)

Rate Up to 0.031 lb ai/A (2 fl oz Aim EC)

Time Apply during planting or up to 24-hours after potatoes have been planted. Applications must be made before the crop emerges.

Application methods Ground in a minimum of 10 gal/A or aerial in a minimum of 3 gal/A. Use higher spray volumes when there is a dense weed population or crop canopy. Apply Aim EC with a crop oil concentrate at 1% v/v or a methylated seed oil at a minimum of 1 quart/A or 1% v/v when applied in volumes of more than 20 gal/A.

Remarks Apply to actively growing weeds not more than 4 inches tall or rosettes 3 inches in diameter. Coverage is essential for good control. Tank mixes with other herbicides may increase spectrum of control.

Caution Do not exceed 0.031 lb ai/A (2 fl oz Aim EC) for preplant and/or preemergence burndown treatments. Do not exceed 0.181 lb ai/A (11.6 fl oz Aim EC) total per crop season. This total allowable usage applies to all applications made to the field per calendar year including burndown treatments and harvest-aide.

Tank-mixtures Tank mixes with other herbicides labeled for preemergence burndown applications in potato such as glyphosate or paraquat may increase spectrum of control. Read and follow applicable

"Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Re-cropping restrictions Following an application of Aim EC, a registered crop may be planted at any time.

Rotational cropping restrictions A field may be rotated to a registered crop at any time after an Aim EC application. All other crops may be planted after 12 mo.

Site of action Group 14: protoporphyrinogen oxidase inhibitor

Chemical family Triazolinone

dimethenamid-P (Outlook 6EC, 6 lb ai/gal)

Rate 12 to 18 fl oz/A (0.56 to 0.84 lb ai/A) in coarse soils and 18 to 21 fl oz/A (0.84 to 1 lb ai/A) in medium- or fine- texture soils. One application only. Do not exceed 21 fl oz/A per season.

Time Apply preemergence only after planting or dragoff.

Application methods Preemergence by ground, chemigation, aerial, or impregnated onto dry bulk fertilizer application. Will not control weeds emerged from soil. Application must be made to clean-tilled soil or with other herbicides that control emerged weeds. Chemigate only through center pivot, lateral move, solid set, or hand move irrigation systems. Apply in at least 0.33 to 0.67 inch of water, using the lower volume on coarser soils and the higher volume on finer soils. Applying in more than 1 inch volume may reduce weed control. See labels for specific application methods and requirements.

Incorporation methods For effective control after ground or aerial preemergence application, rain or sprinkler irrigation or shallow mechanical incorporation is required to move the herbicide into the upper soil surface where weed seeds germinate. Performance is best if either rain or overhead irrigation is within 7 days after application.

Remarks In cold or wet growing conditions, Outlook may cause delayed emergence or early-season stunting of potatoes.

Caution To avoid adverse effects on endangered plant species, comply with the following mitigation measures where these species grow in the counties listed below. Aerial applications must leave a 150-ft untreated buffer between treatment area and endangered plant populations. Ground applications must use low-pressure nozzles that produce only medium to coarse or very coarse droplets and leave a 35-ft untreated buffer between treatment area and endangered plant populations. In Idaho, Kootenai County; in Oregon, Baker, Benton, Josephine, Klamath, Lane, Marion, and Union counties; in Washington, Lincoln County.

Tank-Mixtures Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. Outlook may be applied before, in tank-mixtures with, or after the use of one or more of these registered herbicides: Chateau, Eptam, Matrix, Poast Plus, Prowl, Select, Sencor, Treflan HFP, glyphosate, or paraquat.

Re-cropping restrictions If Outlook has been applied to potatoes and the crop fails due to weather or other reasons, replanting potatoes is not recommended. Any other crop for which Outlook soil applications are

registered may be planted (e.g., corn, dry bean, grain, horseradish, sorghum, soybean).

Rotational cropping restrictions Fall-seeded cereal crops may be planted 4 mo after Outlook application. There are no rotational crop restrictions the spring after application in the previous year's potato crop.

Site of action Group 15: inhibits very long chain fatty acid synthesis

Chemical family Chloroacetamide

EPTC (Eptam 7E, 7 lb ai/gal)

Rate 3.5 to 7 pints/A (3 to 6 lb ai/A). For nutsedge control, preemergence/dragoff: 7 pints/A Do not exceed 14 pints/A (12.25 lb ai/A) per crop year.

Time Dragoff/preemergence, or early postemergence. Preharvest interval is 45 days.

Application methods Soil surface must be free of dew and incidental moisture, and dry to at least 0.5 inch deep. Incorporate into soil to prevent losing the herbicide. Any cultivation after application should be shallow (i.e., half the depth that the herbicide was incorporated). Preemergence: ground-apply after planting and before emergence, and incorporate. Eptam can be ground-applied preemergence at dragoff, or after hilling, and incorporated with spike-toothed harrows or cultivation equipment. See label for equipment-specific details. Eptam can be applied preemergence by chemigation after clean cultivation. In eastern Washington, eastern Oregon, and Idaho only, ground-apply Eptam preemergence and sprinkler-incorporate with irrigation; see instructions below. Eptam applied preemergence is most effective when applied immediately after hilling to a weed-free surface, because it is not effective on emerged weeds. Postemergence (layby): apply as a directed spray to soil after potatoes emerge and incorporate. Eptam is not effective as a foliar spray on emerged weeds.

Incorporation methods Preemergence: incorporate with power-driven cultivation equipment or rolling cultivators set to cut 2 to 3 inches deep, or with rotary hoes/row wheels set to cut 1 to 1.5 inches deep. Take care that machinery does not damage potato seed pieces or elongating sprouts. Chemigate preemergence applications before weeds emerge or after a clean cultivation by metering into sufficient irrigation water to penetrate 3 to 4 inches deep. Preemergence at dragoff: use spike-tooth harrows or cultivation equipment to incorporate. Preemergence after hilling: ground-apply and sprinkler-incorporate immediately with 0.5 to 0.75 inch water (although label says to sprinkler-incorporate within 36 hr after ground application). Application and incorporation must be within 5 days after the last tillage; results will be poor if weeds have germinated. Postemergence (layby): apply as a directed spray to soil after potatoes emerge and incorporate postplant treatments 2 to 3 inches deep with a rolling cultivator or other equipment suggested on label for postplant incorporation. Take care that machinery does not damage potato seed pieces or elongating sprouts. Apply with chemigation by metering into sufficient water to penetrate 3 to 4 inches deep. Apply Eptam before weeds emerge or after a clean cultivation.

For semiarid areas of eastern Washington, eastern Oregon, and Idaho only: sprinkler-incorporate Eptam immediately after ground application with 0.5 to 0.75 inch water. Application and incorporation must be within

5 days after the last tillage; results will be poor if weeds have germinated.

Remarks Eptam is not effective on emerged weeds. Eptam is highly volatile. It must be applied to soil that is free from dew and other moisture, and dry to at least 0.5 inch deep. Whenever possible, apply and incorporate in the same operation. If application and incorporation are separate, Eptam must be incorporated the same day as it is applied.

Caution Do not exceed 14 pints/A (12.25 lb ai/A) per crop year. Preharvest interval is 45 days. Using a Dammer- Diker after applying Eptam brings untreated soil to the surface; weed control may be reduced.

Tank-Mixtures Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. Eptam may be applied in tank-mixtures with one or more of these registered herbicides: preemergence—Chateau, Matrix, Outlook, Prowl, Sencor, or in a three-way tank-mixture with Dual Magnum + Prowl; postemergence—with Sencor (up to 6-inch potato height), Matrix. In the Pacific Northwest and northern regions defined on label, Eptam + Sencor tank-mixtures can be applied only by chemigation.

Re-cropping restrictions No re-cropping or rotational restrictions for Eptam on label.

Site of action Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family Thiocarbamate

ethalfuralin (Sonalan HFP, 3 lb ai/gal)

Rate 1.33 to 2.67 pints/A (0.5 to 1 lb ai/A). Rate ranges for coarse-, medium-, and fine-textured soils: 1.33 to 2 pints/A, 2 to 2.67 pints/A, 2.67 pints/A.

Time After planting, and prior to potato emergence only. If incorporation by rainfall or sprinkler irrigation is planned, then apply immediately after planting for best results. Do not apply after potato emergence.

Application methods Preemergence-ground or chemigation (overhead sprinkler irrigation in 0.5 to 1 inch water).

Incorporation methods Preemergence: if continuous rainfall or irrigation of 0.5 to 1 inch water occurs within 2 days of application, then no further incorporation is needed. Mechanically incorporate if rainfall or irrigation does not occur within 2 days after application. Mix thoroughly in the top 2 to 3 inches of soil. Set incorporation equipment so that the bed and furrow will be uniformly covered with a layer of treated soil. Avoid disturbing seed pieces and/or unemerged shoots. Do not expose untreated soil during the mechanical incorporation process. Do not incorporate using furrow irrigation.

Remarks Rainfall or sprinkler irrigation prior to application tends to seal the soil surface. When rain or sprinkler irrigation incorporation is intended, Sonalan HFP moves more effectively into the weed germination zone if it is applied immediately after tillage and planting. Sonalan HFP may be shallowly cultivated after application and incorporation without reducing weed control, as long as no untreated soil is exposed.

Caution Do not exceed 2.67 pints/A per season. Do not apply after crop emergence.

Tank-Mixtures Read and follow applicable “Restrictions and Limitations and Directions for Use” on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Re-cropping restrictions If replanting is required, then plant only crops listed on the Sonalan HFP labels.

Rotational cropping restrictions Sugar beets may be planted no earlier than 8 mo after application and a moldboard plowing operation to a depth of at least 12 inches before planting. No other rotational cropping restrictions are listed on the label for Idaho, Oregon, or Washington; however, refer to the label for special rotation restrictions in other states.

Site of action Group 3: microtubule assembly inhibitor

Chemical family Dinitroaniline

flumioxazin (Chateau 51% WDG)

Rate 1.5 oz/A (0.047 lb ai/A) for preemergence suppression of weeds such as hairy nightshade, common lambsquarters, Palmer amaranth, redroot pigweed, and wild mustard. 1.5 oz/A suppresses weeds listed when applied to soils with up to 5% organic matter. Do not exceed 1.5 oz/A in a single application or growing season.

Time Apply after hilling but before potatoes emerge. At least 2 inches of soil must cover the vegetative part of the potato plant at application. If applied to potatoes with less than 2 inches of soil cover, or during or after potatoes emerge, potato crop may be injured. Chateau may not control weeds that germinate after application but before an activating rain or irrigation.

Application methods Ground, chemigation (center pivot only, end guns must be turned off), and aerial. Best timing is shortly after hilling, before potatoes emerge. See labels for specific application methods and requirements. Use 10 to 30 gal/A spray solution to ensure adequate coverage. Apply via chemigation in 0.5 to 0.75 inches water during the first sprinkler set.

Incorporation methods Moisture is necessary to activate Chateau in soil for residual weed control. When moisture after application is not adequate, at least 0.25 inch sprinkler irrigation may improve weed control. Rain or irrigation should be as soon as possible and within 7 days after application, and before the most advanced potato sprouts are within 2 inches of the settled soil surface. Mechanically incorporating into soil or cultivating after applying reduces residual weed control is not recommended.

Remarks Chateau has low solubility compared with most other herbicides used in potato production. Low herbicide solubility usually leads to low mobility in the soil profile. Thus, Chateau most likely will not move out of the weed-seed germination zone. Application to poorly drained soil and/or during cool, wet weather may injure crop. Treated soil splashed on newly emerged crops may temporarily injure crop. Potato varieties may vary in their response to Chateau.

Caution At least 2 inches of settled soil must cover the vegetative part of the potato plant at application or crop can be damaged. After applying Chateau, properly clean spray equipment before applying other materials to any crop foliage; see “Sprayer Cleanup” on labels for specific information. No preharvest interval is listed on labels.

Tank-Mixtures Tank-mix Chateau with other

preemergence-labeled herbicides for broad-spectrum weed control. Read and follow applicable “Restrictions and Limitations and Directions for Use” on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Re-cropping and rotational restrictions Replanting potatoes is not recommended if the treated potato crop fails (e.g., due to hail or other bad weather). If potatoes are replanted do not reapply Chateau. Soybeans may be planted immediately after the Chateau application. Field corn, sorghum, sunflower, or wheat can be planted 30 days after a Chateau application if at least 1 inch of rain or irrigation has occurred between application and replanting. Barley, dry and snap beans, peas, rye, and sweet corn may be planted 3 mo after application. Alfalfa, canola, clover, oats, and sugar beets may be planted 4 mo after application if soil is tilled before planting, or 8 mo after application if soil is not tilled before planting. All other crops not listed may be planted 4 mo after application if soil is tilled prior to planting, or 8 mo after application if soil is not tilled before planting if a successful soil bioassay was performed before planting. See labels for all other crops not listed.

Site of action Group 14: protoporphyrinogen oxidase inhibitor

Chemical family N-phenylphthalimide

glyphosate (Several trade names)

Rate 0.38 to 1.1 lb ae/A for most species

Time Delay herbicide application to allow maximum weed emergence but apply before potatoes emerge. Herbicide will not control weeds that emerge after application. In coarse or sandy soils, apply before potato sprouting to minimize crop damage.

Application methods See label for rates and gal/A of water recommended for specific species. Some glyphosate formulations require use of nonionic surfactant; see label for details on additive use. Adding 1% to 2% dry ammonium sulfate (AMS) by weight or 8.5 to 17 lb/100 gal spray-mix may increase performance. The equivalent rate of AMS in a liquid formulation also may be used.

Remarks Good growing conditions enhance glyphosate activity.

Caution Glyphosate applied after crop emergence will injure or kill potatoes. Follow all use restrictions and precautions on label.

Tank-Mixtures Tank-mixtures are not stated or approved on most glyphosate labels. Read and follow applicable “Restrictions and Limitations and Directions for Use” on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Site of action Group 9: inhibits EPSP synthase

Chemical family None generally accepted

metolachlor (Stalwart, 8 lb ai/gal)

Rate Preemergence: 1 to 2 pints/A (1 to 2 lb ai/A). After hilling/layby: 1.67 pints/A (1.67 lb ai/A). Use lower rate on coarse soils or soils low in organic matter (OM). Use higher rate on soils that are relatively fine or high in OM. Up to 2.75 pints/A can be used on soils with 6% to 20% OM.

Time Preemergence before weeds emerge, or

postemergence after hilling/layby. Do not apply as both a preplant-incorporated and a preemergence treatment. The layby application can be made over a previous application of this product, but do not exceed 3.7 pints/A Stalwart per season. Do not harvest potatoes within 60 days of the preemergence application from planting to dragoff, or within 40 days after a layby application.

Application methods Ground, chemigation (center pivot only, preemergence only), or aerial. Stalwart may be applied impregnated on dry fertilizer.

Incorporation methods Preemergence: apply after planting or after dragoff or hilling operations before potato or weeds emerge. Postemergence after hilling/layby: application will not control emerged weeds. Sprinkler-incorporate preemergence or layby applications within 7 to 10 days. Chemigation: apply preemergence only in 0.5 to 1 inch irrigation water. Meter into water during entire application period. Use lower water volume on coarse soils and higher volume on fine-texture soils. More than 1 inch chemigation water volume can reduce weed control if herbicide moves below effective zone in soil.

Remarks Effectiveness will be reduced if later cultivation exposes untreated soil. If conditions are cool and wet after application, Stalwart may delay maturity and/or reduce yield of "Superior" and other early-maturing varieties.

Caution Do not use on muck or peat soils.

Tank-Mixtures Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. Stalwart may be applied with Sencor preemergence. Apply this tank-mix postemergence only as a directed or semi-directed spray to avoid chlorosis, minor necrosis, or leaf discoloration. Stalwart may be applied with Prowl preemergence, preemergence incorporated, or early postemergence, as Prowl label directs. Stalwart may be applied in a three-way tank-mixture with Prowl + Eptam.

Re-cropping restrictions If a crop treated with Stalwart fails, any Stalwart-labeled crop may be planted immediately. Do not make a second broadcast application of Stalwart. If Stalwart was banded in the failed crop and the second crop is planted in the untreated row middles, a second banded treatment may be applied.

Rotational cropping restrictions Alfalfa may be planted after 4 mo; barley, oats, rye, or wheat may be planted at 4.5 mo; and tomato may be planted 6 mo after Stalwart application. Clover may be planted 8 mo after application. Any Stalwart-labeled crop or root crops, tobacco, barley, buckwheat, milo (sorghum), oat, rye, wheat, cabbage, or peppers may be planted the spring after Stalwart applications the previous growing season. All other rotational crops may be planted 12 mo after a layby application. Any Stalwart-labeled crop or tobacco, cabbage, or peppers may be planted the next spring after layby or multiple applications of Stalwart.

Site of action Group 15: inhibits very long chain fatty acid synthesis

Chemical family Chloroacetamide

metribuzin (Sencor 4, 4 lb ai/gal; or Sencor DF 75%; or others)

Rate Preemergence: use 0.5 to 2 pints/A Sencor 4 or 0.33 to 1.3 lb/A Sencor DF (0.25 to 1 lb ai/A)

not exceeding 0.5 lb ai/A on sandy soils or sensitive varieties; use 0.25 to 0.5 lb ai/A to control wild mustard only. Postemergence for redroot pigweed and common lambsquarters: use 0.5 to 1 pint/A Sencor 4, or 0.33 to 0.67 lb/A Sencor DF (0.25 to 0.5 lb ai/A). Postemergence for other weeds listed on label: use 1 pint/A Sencor 4 or 0.67 lb/A Sencor DF (0.5 lb ai/A). Split applications, preemergence + postemergence: not exceeding 1 lb ai/A total per season. Split applications (postemergence + postemergence) in Idaho, Oregon, and Washington only: two postemergence applications can be made if Sencor has been applied postemergence. Redroot pigweed and common lambsquarters only: 0.5 to 1 pint/A Sencor 4 or 0.33 to 0.67 lb/A of the 75%DF (0.25 to 0.5 lb ai/A), not to exceed 0.375 lb ai/A per application on coarse (sandy) soils with low organic matter. For other weeds listed on label and for hairy nightshade suppression, on medium and heavy soils: 0.5 lb ai/A per application. Allow at least 14 days before the second postemergence application. Common cocklebur, most mustards, shepherdspurse, or most grass species listed on label are controlled with preemergence but not postemergence applications. Russian thistle can be controlled only with postemergence applications. Other weeds listed on label may be controlled with preemergence or postemergence applications, except for barnyardgrass and common sunflower, which require two applications for control. See supplemental label for rates in seed potato fields.

Time Both formulations may be applied preemergence or postemergence before weeds are 1 inch tall; or preemergence + postemergence or twice postemergence 14 days apart if not used preemergence. For optimum control with postemergence Sencor, apply before weeds are 1 inch tall. Do not apply within 24 hr of applying other pesticides. Do not apply after June 30 if treated land is to be planted to crops other than potatoes. Do not apply Sencor within 60 days of harvest.

Application methods Ground, chemigation, or aerial.

Incorporation methods Do not mechanically incorporate preemergence Sencor treatments. Sencor may be applied preemergence and/or early postemergence through center pivot, solid set, and lateral roll system sprinklers. Apply proper rate in 0.25 to 0.75 inch of water (0.25 to 0.5 inch on sandy soil) as a continuous injection in center pivot and self-propelled wheel move systems, or in the last 15 to 30 min of set-in solid-set sprinkler irrigation systems.

Remarks Sencor may not control triazine-resistant weeds. If applying postemergence with ground equipment, overhead moisture from rain or sprinkler irrigation within 24 hours after application may decrease control. Mechanical cultivation after treatment reduces weed control and may injure potato.

Caution "Atlantic", "Bellchip", "Chipbelle", "Shepody", "White Rose", "Norchip", "Hi Plains", "Centennial Russet", and "Cascade" varieties are sensitive to metribuzin and may be severely injured. Do not apply postemergence to early-maturing, smooth-skinned, white-skinned, or red-skinned varieties of potato. Other new varieties may be sensitive to metribuzin applied postemergence. When growing varieties for the first time, do not treat entire acreage until potato sensitivity is determined. Do not apply postemergence within 3

days after cloudy, cool, or wet weather. Do not apply to potatoes under stress (moisture, disease, mechanical injury, nutrient deficiency, frost damage, or excessive heat), or crop may be injured.

Tank-Mixtures Read and follow applicable “Restrictions and Limitations and Directions for Use” on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. Sencor may be applied in two- or three- way tank-mixtures with Chateau, Dual Magnum, Eptam (chemigation only), Matrix, Outlook, or Prowl, and preemergence only in three-way tank-mixtures with Matrix + Dual Magnum, Eptam, or Prowl, or with Dual Magnum + Eptam.

Re-cropping restrictions None on label.

Rotational cropping restrictions Do not plant onions, lettuce, cole crops, or cucurbits during the growing season following Sencor applications. Do not plant sugar beets for 18 mo after Sencor application. Certain cereal varieties are sensitive to Sencor (see cereal section of label) and should not be planted during the growing season after Sencor use unless moldboard plowing deeply enough to mix the upper 8 inches of soil and potato vines left in rows after harvest are uniformly distributed over the soil surface before plowing.

Site of action Group 5: photosystem II inhibitor

Chemical family Triazinone

paraquat (Gramoxone Inteon, 2 lb paraquat cation/gal; or Firestorm, 3 lb paraquat cation/gal)

Rate 1 to 2 pints/A (0.25 to 0.5 lb ae/A) Gramoxone Inteon; or 0.7 to 1.3 pints/A (0.26 to 0.49 lb ae/A) Firestorm. Do not exceed three applications of Firestorm per year.

Time Apply after weeds emerge but before potatoes emerge. Delay application to allow maximum weed emergence, but apply no later than ground cracking, before potatoes emerge. Paraquat will not control weeds that emerge after application. Do not exceed three applications per year.

Application methods Ground or aerial. Add a nonionic surfactant containing 75% or more surface-active agent at 0.125% v/v (1 pint/100 gal spray mix) or crop oil concentrate at 1% v/v (1 gal/100 gal spray mix) for ground applications or 1 pint/A for aerial applications. The herbicide kills most green plant growth on contact; thus good spray coverage is essential.

Remarks Nonselective, postemergence herbicide. Paraquat is rainfast 0.5 hour after application.

Caution **A restricted-use herbicide.** Applications after crop emerges have reduced yields because of injury. Follow all use restrictions and precautions on label. Requires special safety equipment for handling, mixing, and spraying.

Tank-Mixtures See label for allowed tank-mixtures. Read and follow applicable “Restrictions and Limitations and Directions for Use” on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Site of action Group 22: photosystem I electron diversion

Chemical family Bipyridilium

pendimethalin (Prowl 3.3EC, 3.3 lb ai/gal; or Prowl H2O, 3.8 lb ai/gal)

Rate Prowl 3.3EC: 1.2 to 1.8 pints/A (0.5 to 0.74 lb ai/A) in coarse soil; 1.8 to 2.4 pints/A (0.74 to 1 lb ai/A) in medium-texture soil with less than 3% organic matter; 2.4 to 3.6 pints/A (1 to 1.5 lb ai/A) in medium-texture soil with more than 3% organic matter or fine-texture soil with less than 3% organic matter; and 3.6 pints/A (1.5 lb ai/A) in fine-texture soil with more than 3% organic matter. Prowl H2O: 1.5 pints/A (0.7 lb ai/A) in coarse soil; 2 pints/A (0.95 lb ai/A) in medium-texture soil with less than 3% organic matter; and 3 pints/A (1.4 lb ai/A) in medium-texture soil with more than 3% organic matter or in fine-texture soil.

Time Preemergence and preemergence-incorporated after planting but before potatoes and weeds emerge, and early postemergence up to the 6-inch stage of potato growth. Preemergence-incorporated applications can also be made before or at dragoff.

Application methods Ground, chemigation, or aerial. Prowl can be applied preemergence in liquid fertilizer or impregnated onto dry fertilizer (see label for specific requirements/restrictions).

Incorporation methods Preemergence ground or aerial applications must have rain, irrigation, or shallow mechanical incorporation to move herbicide into the upper soil surface where weeds germinate. Prowl is most effective with adequate rain or irrigation within 7 days of application. During the shallow mechanical incorporation for preemergence-incorporated applications, take care that equipment does not damage seed pieces or elongating sprouts. Preemergence-incorporated application can be made and incorporated before, at, or after dragoff but before potato and weeds emerge. In furrow-irrigated fields, apply after final hilling and thoroughly incorporate 1 to 2 inches deep with equipment that will not damage potato seed pieces or elongating sprouts. Chemigate with 0.5 to 0.75 inch irrigation water during the first sprinkler set. Apply only through center pivot, lateral move, end tow, side/wheel roll, traveler, big gun, solid set, or hand move irrigation systems.

Remarks Will not control established weeds. Prowl is most effective with adequate rain or overhead irrigation after application.

Caution Do not exceed maximum rate allowed for any soil type. Do not apply postemergence if potatoes are stressed because the crop may be injured. Do not apply to peat or muck soils. Do not apply more than once per season. “White Rose” may be injured if Prowl H2O is applied during or before cool and/or wet weather.

Tank-Mixtures Read and follow applicable “Restrictions and Limitations and Directions for Use” on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. Prowl may be applied preemergence with Chateau, Eptam, Dual Magnum, Matrix, Outlook, and/or Sencor. Prowl + Eptam may be applied early postemergence by chemigation only (from potato crop emergence to 6 inch height). Prowl + Sencor may be applied early postemergence. Prowl + Eptam + Sencor may be applied by ground or chemigation preemergence in Idaho, Oregon, or Washington only. Prowl + Eptam + Sencor may be applied early postemergence by chemigation only.

Re-cropping restrictions If crop fails because of weather, any crop registered for preplant-incorporated applications of Prowl may be replanted without adverse effects the same year. If replanting is necessary, do not work the soil deeper than the treated zone.

Rotational cropping restrictions Wheat and barley may be planted 4 mo after application. Do not plant sugar beets, red beets, or spinach for 12 mo after application; plow soil 12 inches deep before planting these crops. All other crops can be planted the following year. If crop fails where irrigation is necessary to produce the crop treated with Prowl, and the treated land is fallowed in summer, do not plant winter wheat or winter barley as follow crops that fall.

Site of action Group 3: microtubule assembly inhibitor

Chemical family Dinitroaniline

rimsulfuron (Matrix 25%DF)

Rate Preemergence or postemergence: use 1 to 1.5 oz/A (0.0156 to 0.023 lb ai/A); can split preemergence + postemergence or postemergence + postemergence. Do not exceed a total of 2.5 oz/A (0.039 lb ai/A).

Time May be applied preemergence after hilling or dragoff but before potatoes and weeds emerge; postemergence when weeds are small (less than 1 inch high or across for most species); as a split preemergence + postemergence application; or as a split postemergence + postemergence application. For best results, apply Matrix immediately after hilling, dragoff, or Dammer Diker operation to a clean, newly prepared seedbed. Depending on rain or other environmental conditions and the density of potato variety top growth (e.g., varieties such as “Russet Norkotah” may have poor top growth), a second rimsulfuron application may be needed to control second flushes of germinating annual weeds and new growth of treated perennials from underground roots or stolons. Make the second application 14 to 28 days after the first, and apply to small weeds that are less than 1 inch high or diameter that are actively growing. Quackgrass and crabgrass control may be better with postemergence than preemergence applications. For best Canada thistle control, apply Matrix when weeds are small and actively growing. Quackgrass and Canada thistle not emerged at application require a second postemergence application for control.

Application methods Ground, chemigation, or aerial. Postemergence alone, always use a surfactant—a nonionic surfactant (NIS) at 0.125 to 0.25% v/v (1 to 2 pints/100 gal spray mix)—or a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% v/v (1 gal/100 gal spray mix). Postemergence + Sencor, use an NIS only; adding other adjuvant types such as MSO or COC may reduce crop tolerance. Do not apply aerially during a temperature inversion, when winds are gusty, or when conditions favor poor coverage and/or off-target spray movement.

Incorporation methods Chemigation: apply Matrix in 0.33 to 1 inch/A water (0.33 to 0.5 inch on sandy soils) as a continuous injection in center pivot and self-propelled wheel move systems. For hand line and solid-set sprinkler irrigation systems, inject at the beginning of the set and apply 0.33 to 1 inch water. Research in Idaho shows that chemigated rimsulfuron controls weeds more consistently if applied preemergence and

at the full labeled rate of 0.023 lb ai/A (1.5 oz/A). If rimsulfuron is chemigated after weeds emerge, weeds must be very small (cotyledon to two-leaf stage) for acceptable control, and a nonionic surfactant must be added to the spray mix. After preemergence ground or aerial applications, activate Matrix in soil with 0.33 to 1 inch sprinkler irrigation (or a single rain) as soon as possible or within 5 days after application. Activating sprinkler irrigation is required regardless of soil moisture level at planting, and unless a single rain after application equals the activation moisture requirements. Follow postemergence ground or aerial applications by 0.33 to 1 inch of rain or sprinkler irrigation no sooner than 4 hours or later than 5 days for soil activation and best weed control.

After preemergence or postemergence applications, apply at least 0.33 inch sprinkler irrigation to sandy soil, 0.5 inch to sandy loam, 0.75 inch to silt, and 1 inch to clay.

Remarks Matrix is a sulfonylurea herbicide. Biotypes of kochia, prickly lettuce, and Russian thistle resistant to sulfonylurea herbicides infest Idaho, Oregon, and Washington; Matrix will not control them. Therefore, use resistance-management strategies with Matrix. A key strategy is to tank-mix Matrix with a herbicide that has a different mode of action and is effective on the resistant species. Also, cultural practices such as tillage, preventing weed escapes from going to seed, and good sanitation can help delay development of herbicide-resistant weed populations. Matrix is active on hairy nightshade but does not control cutleaf nightshade. When both hairy and cutleaf nightshade infest a field, tank-mix Matrix with Eptam, Dual Magnum, or Stalwart to control both species. For information about Matrix used in seed potatoes, see “Rimsulfuron—potatoes grown for seed” below.

Caution Applied postemergence, Matrix may temporarily yellow potato foliage. Under environmental stress (cool, wet weather or hot or humid weather), rimsulfuron applied postemergence also may cause leaf malformations and stunt growth. Potatoes recover within 7 to 15 days. To reduce potential injury, apply only if the weather has been sunny at least 3 successive days. Avoid using COC or MSO adjuvants when potatoes are under heat stress. Do not use on seed potatoes unless permitted by a supplemental label. Do not apply within 60 days of harvest. Do not cultivate later than 7 days before or for 7 days after a postemergence application. Optimum time for cultivation after postemergence application is 7 to 14 days. Avoid spray drift. Matrix is very active even at low dosages, and many crops, including small grains, canola, sugar beet, peas, and onions, are very sensitive to Matrix drift.

Tank-Mixtures Read and follow applicable “Restrictions and Limitations and Directions for Use” on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. Preemergence tank-mixtures can be made with Chateau, Dual Magnum, Eptam, Outlook, Prowl 3.3EC or Prowl H2O, and/or Sencor. Postemergence tank-mixtures can be made with Sencor (use an NIS only) or Eptam (1 pint/A Eptam; include 2 lb/A spray-grade ammonium sulfate and methylated seed oil or organo-silicon/modified seed oil blend; for best results, rain or sprinkler irrigation of 0.33 to 1 inch no sooner than 4 hr but not later than 1 day after application). Rimsulfuron may be tank-mixed with suitable registered fungicides

in postemergence applications; see label for specific combinations and instructions.

Re-cropping restrictions No specifics are stated on labels.

Rotational cropping restrictions Corn may be planted any time; winter wheat may be planted after 4 mo; barley, spring wheat, and spring oats after 9 mo except in certain Idaho counties (Teton, Caribou, Madison east of Hwy. 20, and Fremont east of Hwy. 20) where barley may be planted after 18 mo; beans (dry and succulent), sweet corn, sunflowers, and soybeans after 10 mo; and sugar beets after 18 mo. Alfalfa, mint, and grass/pasture/hay seed may be planted after 4 mo, onions after 10 mo, and peas after 8 mo if potatoes were grown under sprinkler irrigation with a minimum of 18 inches water per season in sand, loamy sand, and sandy loam soils having not more than 1.5% organic matter. Rate restrictions apply to some counties in Washington and Oregon. Refer to supplemental labels. Rotation intervals may need to extend to 18 mo if drought prevails after application and before planting the rotation crop unless supplemental sprinkler irrigation has been more than 15 inches during the potato growing season. Rotation interval may need to extend to 18 mo after applying in seed potato production if production practices decrease water amount/irrigation frequency and/or time for Matrix breakdown: that is, late planting. See supplemental label for details.

Site of action Group 2: acetolactate synthase (ALS) inhibitor

Chemical family Sulfonylurea

rimsulfuron (Matrix 25%DF)

Potatoes grown for seed

Rate Preemergence: 1.5 oz/A. Postemergence: 1 to 1.5 oz/A. Split preemergence: 1 to 1.5 oz/A followed by postemergence at 1 oz/A. Postemergence: 1 oz/A followed by postemergence at 1 oz/A. Do not exceed 2.5 oz/A per year.

Remarks May be used on potatoes grown for seed that use field-grown tubers as the planted seed piece, and are at least the progeny of the first field planting (first field planting uses laboratory-tested stocks that may be tissue-cultured plantlets, greenhouse-produced microtubers, minitubers, stem cuttings, or line selections). Do not use on potatoes grown for seed if grown from microtubers or transplants; these may be referred to as Generation 1, Nuclear, Elite 1, or Pre-Elite.

Incorporation methods To activate preemergence applications, moisture must be supplied by a single rain or sprinkler irrigation of 0.33 to 1 inch depending on soil texture (apply at least 0.33 inch to sandy soils, at least 0.5 inch to sandy loam soils, at least 0.75 inch to silt soils, and at least 1 inch to clay soils) within 5 days after application, to move herbicide 2 to 3 inches into the soil.

Caution Do not apply to plants stressed by cold, drought, herbicide injury, and/or insect or disease injury. Consider informing your state seed certification agency or inspector that this herbicide has been applied to your seed potatoes. Application to crop under stress (such as drought, frost, or extreme temperatures or temperature variations) may cause temporary chlorosis, leaf crinkling, pinching of terminal leaflet, and/or mottled leaf color. These may be similar to virus symptoms but usually disappear within 5 to 15 days of application.

Rotational cropping restrictions The rotational crop interval for spring barley is extended to 18 mo due to the generally shorter growing seasons and different cultural practices in seed production in California, Idaho, Oregon, Montana, South Dakota, Washington, Colorado, and parts of North Dakota (all counties in North Dakota except Pembina, Towner, Walsh, Grand Forks, Trail, and Cass). The rotational planting interval for other crops on label may need to be extended to 18 mo if seed potato production decreases water and/or time for herbicide breakdown. Practices that may shorten the breakdown are late planting or less frequent irrigations compared with commercial potato production practices. Potatoes can be planted any time after using this herbicide in potatoes grown for seed.

Site of action Group 2: acetolactate synthase (ALS) inhibitor

Chemical family Sulfonylurea

S-metolachlor (Dual Magnum, 7.62 lb ai/gal)

Rate Preemergence: 1 to 2 pints/A (0.95 to 1.9 lb ai/A), using lower rates on soils that are coarse or low in organic matter. Postemergence (layby/after final hilling): 1.67 pints/A (1.6 lb ai/A). Note: S-metolachlor also is formulated as Dual II Magnum (7.64 lb ai/gal and includes a safener for corn) and as Dual IIG Magnum (16% G). Refer to labels to determine rates, timing, etc. for use in potatoes.

Time Apply postplant-incorporated, preemergence, or postemergence layby/after final hilling. In furrow-irrigated fields, apply after final hilling and incorporate with equipment that will not damage potato seed pieces or elongating sprouts.

Application methods Ground, chemigation (center pivot irrigation systems only), aerial.

Incorporation methods Postplant-incorporated: can be applied any time after planting but before potato emerges. Incorporate with an implement that evenly distributes herbicide into top 2 inches of soil. Do not damage seed pieces or sprouts with incorporation equipment. Preemergence: apply after planting, preemergence, delayed preemergence, after dragoff, or after hilling but before weeds emerge. Postemergence (layby/after final hilling): this application will not control emerged weeds. Dual Magnum may be applied postemergence over a previous application, but do not exceed 3.6 pints/A in a single growing season. Preemergence or postemergence through chemigation: Dual Magnum may be applied preemergence or postemergence through center-pivot irrigation systems. Apply the proper rate, depending on soil type, in 0.5 to 1 inch of water before weeds emerge. Uniform water incorporation (first water after application) is important.

Remarks If soil is cool and wet after application, Dual Magnum may delay maturity and/or reduce yield of "Superior" and other early-maturing varieties.

Caution Do not apply preplant-incorporated and preemergence. Do not use on muck or peat soils. Crop may be injured after Dual Magnum if soil moisture is abnormally high during early crop development. Do not harvest within 60 days after the at-planting to preemergence dragoff/after hilling application or within 40 days after a postemergence layby/after final hilling application.

Tank-Mixtures Read and follow the applicable “Restrictions and Limitations and Directions for Use” on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. Dual Magnum may be in a two-way tank-mix with Matrix, Prowl, or Sencor and in a three-way tank-mix with Eptam + Prowl or Matrix + Sencor (preemergence only).

Re-cropping restrictions If potato crop fails, corn, soybeans, potatoes, safflower, or other Dual Magnum-registered crops may be replanted immediately. Do not make a second broadcast application.

Rotational cropping restrictions Do not plant barley, oats, rye, or wheat until 4.5 mo after application. Alfalfa may be planted 4 mo after application. Clover may be seeded 9 mo after application. Any crop labeled for Dual Magnum use and pod and root crops, buckwheat, or milo (sorghum) may be planted the spring after treatment.

Site of action (*S*-metolachlor) Group 15: inhibits very long chain fatty acid synthesis

Chemical family Chloroacetamide

S-metolachlor + glyphosate (Sequence, a formulated premix of 3 lb ai S-metolachlor + 2.25 lb ae/gal glyphosate)

Rate Do not exceed 2.5 pints/A formulated product on coarse soils, 3.75 pints/A formulated product on medium soils with less than 3% organic matter, or 4 pints/A formulated product on fine textured soils with greater than 3% organic matter. Do not exceed 4 pints of Sequence per acre per season.

Time Sequence may be applied during or after planting but before crop emergence.

Application methods Ground in 15 to 40 gal/A or aerial in 3 to 15 gal/A water. Do not apply this product through any type of irrigation system. When foliage is dense, spray volume should be increased to ensure coverage of the target weeds. Flat-fan nozzles will result in the most effective application. Control of emerged weeds may be improved by adding dry ammonium sulfate at 8.5-17 pounds/100 gallons of water. Liquid formulations of AMS may be used at an equivalent rate.

Remarks Sequence is considered a foliar systemic herbicide that may be applied to control a broad spectrum of emerged weeds and can provide some residual control of certain weeds listed on the label. If rainfall or irrigation is not received within 7 days after application of Sequence, residual weed control may be reduced. Under these conditions, cultivate or use other weed control measures if weeds develop. If emerged at application time, weeds must be actively growing. For best possible annual weed control, apply to weeds 6 inches or less in height. If annual weeds have been mowed or grazed prior to application, wait for 3 to 4 inches of new growth to appear prior to application. When perennial weeds have been mowed or grazed, refer to the label for the recommended stage that new growth should reach prior to application.

Caution Application must be made before crop emergence. Contact with potato foliage will result in crop injury. If cool, wet conditions occur after application, Sequence may delay maturity and/or reduce yield of “Superior” or other early-maturing varieties. Do not harvest within 60 days after application.

Tank-Mixtures Sequence can be tank-mixed with

Sencor or Prowl for control or suppression of annual and perennial weeds provided that the tank-mix product label allows use of the product. Refer to the Sequence label for weeds controlled and application rates for these tank mixtures.

Re-cropping restrictions If crop treated with Sequence alone is lost, corn, legume vegetables (succulent or dried), potatoes, sorghum, soybeans, sunflowers, or transplanted tomatoes may be replanted immediately.

Rotational cropping restrictions Do not plant barley, oats, rye, or wheat before 4.5 mo after application; alfalfa 4 mo; tomato 6 mo; or clover 9 mo. Buckwheat, milo (sorghum) cabbage, stone fruits, or tree nuts may also be planted in the spring following treatment.

Site of action Group 15: inhibits very long chain fatty acid synthesis; Group 9: inhibits EPSP synthase

Chemical family Chloroacetamide; none generally accepted

S-metolachlor + metribuzin (Boundary 6.5 EC, a formulated premix of 5.25 lb ai S-metolachlor + 1.25 lb ai/gal metribuzin)

Rate Preemergence: 1.5 to 2.9 pints/A (1 lb ai/A S-metolachlor + 0.23 lb ai/A metribuzin to 1.9 lb ai/A S-metolachlor + 0.45 lb ai/A metribuzin). Postemergence (for application in center pivot irrigation water only): 1.5 to 2.2 pints/A (1 lb ai/A S-metolachlor + 0.23 lb ai/A metribuzin to 1.3 lb ai/A S-metolachlor + 0.34 lb ai/A metribuzin). Refer to label for rate ranges according to soil texture. Two applications permitted per year. In soils with 3 to 10% OM, do not exceed 5.1 pints/A per year (3.35 lb ai/A S-metolachlor + 0.8 lb ai/A metribuzin). In soils with 0.5 to 3% OM, do not exceed 4.95 pints/A per year (3.25 lb ai/A S-metolachlor + 0.77 lb ai/A metribuzin). Do not exceed 1 lb ai/A of metribuzin per year.

Time Preemergence: after planting but before crop emergence. Postemergence: after drag-off if that is usual practice, but at least 60 days before harvest.

Application methods Preemergence: ground, irrigation (center pivot irrigation equipment), or aerial. Postemergence: center pivot irrigation equipment only. Meter into irrigation water during entire period of water application. Apply in 0.5 to 1 inch of water. More than 1 inch of water at application may reduce weed control by moving the herbicide below the effective zone in the soil. Refer to the “Center Pivot Irrigation Application” section of the label for more chemigation application information.

Incorporation methods A small amount of rain or irrigation is required to activate Boundary 6.5EC. In areas of low rainfall, follow a preemergence application with irrigation of 0.25 to 0.5 inch of water. Do not irrigate heavily immediately after application.

Remarks Boundary 6.5EC is recommended for preemergence weed control prior to or after potatoes emerge. Boundary 6.5EC has some postemergence activity on weeds, but the consistency and spectrum of weed control is much better preemergence for weeds. As with many surface-applied herbicides, weed control and crop tolerance may vary with rainfall and/or soil texture.

Caution Preplant-incorporated applications are not recommended due to an increased risk of crop injury. Boundary 6.5EC is not recommended for muck or peat soils. Do not apply Boundary 6.5EC postemergence if the weather in the next 3 days is predicted to be cool,

wet, or cloudy, as crop injury may occur. Do not harvest within 60 days of the last Boundary 6.5EC application. Do not apply after June 30 in Idaho, Oregon, or Washington if the treated land will be planted to a crop other than potatoes in the fall. To avoid crop injury, postemergence applications should be made only on russeted or white-skinned varieties of potatoes that are not early maturing. Avoid postemergence applications on "Atlantic", "Bellchip", "Centennial", "Chipbelle", "Shepody", and "Superior" varieties. Preemergence applications on these varieties may cause crop injury under adverse weather conditions, on coarse soils, under high soil pH, and with higher use rates. Potato varieties may vary in their response to a given herbicide application. When using Boundary 6.5EC for the first time on a particular variety, always determine crop tolerance before using on a field-scale.

Tank-Mixtures Read and follow the applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures. For preemergence applications in potatoes, Boundary 6.5EC may be tank-mixed with other pesticide products registered for use in this way and timing in potatoes. For postemergence applications (center pivot irrigation applications only), i.e., where potato vines are exposed, there may be increased risk of crop injury from certain product mixtures. At this application timing, tank-mix Boundary 6.5EC only with pesticide products that allow tank-mixing and postemergence chemigation on their product label.

Re-cropping restrictions If replanting is necessary in fields previously treated with Boundary 6.5EC, the field may be replanted to soybeans or potatoes. Before replanting, refer to the specific crop use sections for recommendations, precautions, and restrictions.

Rotational cropping restrictions Do not plant winter barley, winter wheat, or alfalfa until 4.5 mo after application. Corn, peas, spring barley, or spring wheat may be planted 8 mo after application. Do not plant asparagus, forage grasses, lentils, tomatoes, or other crops not listed (except root crops) until 12 mo after application. Onions, sugar beets, and other root crops may not be planted until 18 mo after application.

Site of action (S-metolachlor) Group 15: inhibits very long chain fatty acid synthesis; (metribuzin) Group 5: photosystem II inhibitor.

Chemical family (S-metolachlor) chloroacetamide; (metribuzin) triazinone

POTATOES—Grass Control Only

clethodim (Select 2EC, 2 lb ai/gal)

Rate 6 to 16 fl oz/A (0.094 to 0.25 lb ai/A). See label for recommended rates on specific grass species and growth stages. Use the high rate under heavy grass pressure and/or when grasses have reached maximum height. Do not exceed a total of 32 fl oz/A per season.

Time Apply to actively growing grasses with recommended weed heights. Apply when the first grass species in a mixed-grass-weed population reaches the recommended growth stage for treatment. Where irrigation supplements limited rain, apply Select as soon as possible within 7 days after irrigation. In arid regions,

a second application generally controls perennial grasses more effectively than a single application. Make the second application 2 to 3 wk after the first. Do not apply a postemergence broadleaf herbicide within 1 day after a Select application; grass control may be reduced. Do not cultivate less than 7 days before or after applying Select. Do not apply Select if rain is expected within 1 hour after application. Preharvest interval is 30 days.

Application methods Ground or aerial. Always use a crop oil concentrate (COC), 1 quart/A COC for ground applications and 1% v/v (but not less than 1 pint/A) COC for aerial applications. One to 2 quarts/A liquid fertilizer or 2.5 to 4 lb/A spray-grade ammonium sulfate (AMS) may be added to the spray mix in addition to COC. Adding AMS improves control for difficult species such as quackgrass, wild oat, volunteer cereals, or volunteer corn. Do not apply by chemigation.

Remarks Select controls annual and perennial grasses; Select does not control sedges or broadleaves. Do not apply to stressed grass plants; control may be reduced. Perennial grass control is best if rhizomes or stolons are cut up before planting crop, to stimulate maximum emergence of grass shoots. Minor leaf spotting on treated plants may occur under certain environmental conditions, but new foliage will be unaffected.

Caution Grass crops such as corn, sorghum, rice, small grains, and turf are highly sensitive to Select. The Select 2EC label does not specify uses in potato grown for seed.

Tank-Mixtures Mixtures of Select and broadleaf herbicides may reduce grass control. An additional Select application may be necessary. Do not apply Select if broadleaf weeds are tall or dense enough to prevent proper coverage. Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

Re-cropping restrictions None on the label.

Rotational cropping restrictions None on the label.

Site of action Group 1: acetyl CoA carboxylase (ACCase) inhibitor

Chemical family Cyclohexanedione

sethoxydim (Poast 1.5 lb ai/gal; or Poast Plus 1.0 lb ai/gal)

Rate Most annual grasses: 1.5 pints/A Poast; or 2.25 pints/A Poast Plus (0.28 lb ai/A). Volunteer cereals: 2 pints/A Poast or 3 pints/A Poast Plus (0.375 lb ai/A). See the quackgrass and wild oat sections for specific rates and directions for control of these grasses.

Time Apply to actively growing annual grasses at stage of grass growth indicated on label. To control volunteer cereals, apply before tillering up to 4 inches tall. Do not cultivate within 5 days before or 7 days after application. Cultivating 7 days or later after application may help provide season-long control. Do not apply within 30 days of harvest.

Application methods Ground or aerial. In irrigated areas, it may be necessary to irrigate before treatment to ensure active weed growth. Always add a nonphytotoxic oil concentrate to the spray tank at 32 oz/A or methylated seed oil at 20 oz/A or Dash HC at 16 oz/A.

Remarks See labels for specific rates for weed species

and weed size. Poast or Poast Plus is most effective on actively growing grasses before they reach the maximum size listed on label. Larger, more mature grasses can often be controlled but may require two applications. Poast or Poast Plus will not control annual bluegrass or any of the fine fescues and is relatively weak on downy brome.

Caution Control may be erratic on grasses stressed by drought, temperature extremes, insect damage, herbicide injury, or other factors. Do not apply if rain is expected within 1 hour after application. Do not apply through any type of irrigation equipment.

Tank-Mixtures Poast or Poast Plus can only be tank-mixed with metribuzin in potatoes. Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture.

The most restrictive labeling applies to use of tank-mixtures. Do not apply this tank-mix if grasses to be controlled include rhizome Johnsongrass, quackgrass, Bermudagrass, wirestem muhly, volunteer corn or cereal, shattercane, red rice, or itchgrass.

Site of action Group 1: acetyl CoA carboxylase (ACCase) inhibitor

Chemical family Cyclohexanedione

POTATOES—Quackgrass

EPTC (Eptam 7E, 7 lb ai/A)

Rate 4.5 pints/A (4 lb ai/A)

Time Apply and incorporate just before planting potatoes.

Remarks Thoroughly till quackgrass before application; chop rhizomes into pieces 2 to 3 inches or smaller. Eptam must be incorporated immediately and thoroughly after application, either with a rotovator or by cross-disking. Use on mineral soils containing less than 10% organic matter. See previous entries in this section for application and incorporation methods, remarks, cautions, re-cropping and rotational cropping restriction, and site of action/chemical family information specific to this herbicide.

Site of action Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family Thiocarbamate

rimsulfuron (Matrix 25% DF)

Rate 1 to 1.5 oz/A of the 25% DF (0.0156 to 0.023 lb ai/A) + nonionic surfactant at 0.125 to 0.25% v/v (1 to 2 pints/100 gal spray solution) or crop oil concentrate or methylated seed oil at 1% v/v (1gal/100 gal spray solution)

Time Apply postemergence to 4- to 6- inch quackgrass.

Remarks Also may use as a split postemergence + postemergence application. Use 1 to 1.5 oz/A Matrix + 0.125 to 0.25% nonionic surfactant (1 to 2 pints/100 gal spray solution) at each application; do not exceed a total of 2.5 oz/A Matrix. In split applications, make the second 14 to 28 days after the first. See previous entries in this section for application and incorporation methods, remarks, cautions, re-cropping and rotational cropping restriction, and site of action and chemical family information specific to this herbicide. Applied postemergence, Matrix may temporarily yellow potato foliage. Under environmental stress (cool, wet or hot or humid weather), rimsulfuron applied postemergence

also may stunt growth and cause leaf malformations. Potatoes recover within 7 to 15 days. To reduce injury, apply only if it has been sunny at least 3 successive days. Do not use on seed potatoes unless permitted by a supplemental label.

Site of action Group 2: acetolactate synthase (ALS) inhibitor

Chemical family Sulfonylurea

sethoxydim (Poast, 1.5 lb ai/gal; or Poast Plus, 1 lb ai/gal)

Rate 2.5 pints/A Poast or 3.75 pints/A Poast Plus (0.47 lb ai/A)

Time Apply when quackgrass shoots are 6 to 8 inches tall. A second application at 0.28 lb ai/A (1.5 pints/A Poast or 2.25 pints/A Poast Plus) may be needed if quackgrass regrows. Best results usually require repeated applications.

Remarks Always add a nonphytotoxic oil concentrate to spray tank at 2 pints/A. Add nitrogen to improve control. Cultivate 7 to 14 days after an initial or sequential application to aid control. May not eradicate quackgrass. Do not tank-mix Poast or Poast Plus with other herbicides for control of quackgrass. See previous entries in this section for application and incorporation methods, remarks, cautions, re-cropping and rotational cropping restrictions specific to this herbicide.

Site of action Group 1: acetyl CoA carboxylase (ACCase) inhibitor

Chemical family Cyclohexanedione

POTATOES—Wild Oat

EPTC (Eptam 7E, 7 lb ai/gal)

Rate 3.5 to 7 pints/A (3 to 6 lb ai/A)

Time Apply and immediately incorporate into soil before planting potatoes or after clean cultivation.

Remarks If applied preplant, thoroughly incorporate into soil immediately after applying 2 to 3 inches deep by cross-disking 4 to 6 inches deep or by tilling with a power-driven rotary tiller cutting 2 to 3 inches deep. If applied after planting, incorporate either mechanically into the top 2 to 3 inches of soil or by sprinkler irrigation. See previous entries in this section for application and incorporation methods, remarks, cautions, re-cropping and rotational cropping restrictions, and site of action and chemical family information for this herbicide.

Site of action Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family Thiocarbamate

paraquat (Inteon, 2 lb paraquat cation/gal; or Firestorm, 3 lb paraquat cation/gal) or glyphosate (various formulations)

Rate Paraquat, applied to fallow ground before planting potatoes: 1.5 to 4 pints/A Gramoxone Inteon (0.75 to 1 lb ae/A); after planting and before potatoes emerge: 1 to 2 pints Gramoxone Inteon (0.5 to 1 lb ae/A) or 1.3 pints/A (0.49 lb ae/A) Firestorm + a nonionic surfactant with 75% or more surface-active agent at 0.125% v/v (1 pint/100 gal spray mix) or crop oil concentrate at 1% v/v

(1 gal/100 gal spray mix) for ground applications or 1 pint/A for aerial applications. Glyphosate: 0.38 lb ae/A.

Time Apply Gramoxone Inteon to fallow ground before planting potatoes. Apply Gramoxone Inteon, Firestorm, or glyphosate before potatoes emerge.

Remarks These materials control only wild oat emerged at the time of application. Wild oat emerging later will not be controlled. Some glyphosate formulations require nonionic surfactant; see label for details. Adding 1 to 2% dry ammonium sulfate (AMS) by weight or 8.5 to 17 lb/100 gal spray-mix may increase performance. The equivalent rate of AMS in a liquid formulation also may be used.

Caution Paraquat is a **restricted-use herbicide**. Do not apply either paraquat or glyphosate if potatoes have emerged, because crop may be injured. See previous entries in this section for application and incorporation methods, remarks, cautions, re-cropping and rotational cropping restriction, and site of action and chemical family information for this herbicide.

Site of action (paraquat) Group 22: photosystem 1 electron diversion; (glyphosate) Group 9: inhibits EPSP synthase

Chemical family (paraquat) bipyridilium; (glyphosate) none generally accepted

rimsulfuron (Matrix 25% DF)

Rate 1 to 1.5 oz/A (0.0156 to 0.023 lb ai/A Matrix + nonionic surfactant at 0.125% to 0.25% v/v (1 to 2 pints/100 gal spray solution) or 1% v/v (1 gal/100 gal spray solution) crop oil concentrate or methylated seed oil if weeds are emerged.

Time May be applied preemergence after hilling or dragoff but before potatoes and wild oat emerge or postemergence to wild oat in the two- to four- leaf stage (3 to 5 inches tall).

Remarks tank-mixes are in Annual Grass and Broadleaf Weeds section. See previous entries in this section for application and incorporation methods, remarks, cautions, re-cropping and rotational cropping restrictions, and site of action and chemical family information for this herbicide.

Caution Applied postemergence, Matrix may temporarily yellow potato foliage. Under environmental stress (cool, wet, or hot or humid weather), Matrix applied postemergence also may stunt growth and cause leaf malformations. Potatoes recover within 7 to 15 days. To reduce potential injury, apply only if the weather has been sunny for at least 3 successive days. Do not use on seed potatoes unless permitted by a supplemental label.

Site of action Group 2: acetolactate synthase (ALS) inhibitor

Chemical family Sulfonylurea

sethoxydim (Poast, 1.5 lb ai/gal; or Poast Plus, 1 lb ai/gal)

Rate 1.5 pints/A Poast; or 2.25 pints/A Poast Plus (0.28 lb ai/A)

Time Apply to actively growing wild oat up to 4 inches tall.

Remarks Always add a nonphytotoxic oil concentrate to the spray tank at 2 pints/A or methylated seed oil at

20 oz/A or Dash HC at 16 oz/A. Depending on the crop, the addition of ammonium nitrate or ammonium sulfate is recommended.

Caution Control may be erratic on grasses stressed by drought, temperature extremes, insect damage, herbicide injury, and other factors. Do not apply if rain is expected within 1 hr after applying. Do not cultivate within 5 days before or 7 days after applying. Preharvest interval is 30 days. Poast or Poast Plus can only be tank-mixed with metribuzin in potatoes. See previous entries in this section for application and incorporation methods, remarks, cautions, re-cropping and rotational cropping restrictions specific to this herbicide.

Site of action Group 1: acetyl CoA carboxylase (ACCase) inhibitor

Chemical family Cyclohexanedione

POTATOES—Tank-Mixtures

NOTE Not all tank-mixtures labeled for use in potatoes are listed. See the potato herbicide labels for other allowed tank-mixtures. Read and follow applicable "Restrictions and Limitations and Directions for Use" on all product labels in a tank-mixture. The most restrictive labeling applies to use of tank-mixtures.

EPTC (Eptam) + metribuzin (Sencor 4 or Sencor DF)

Rate 3.5 pints/A Eptam on coarse soils or 4.5 pints/A Eptam on fine-texture soils + 0.5 to 1 pint/A Sencor 4 or 0.33 to 0.67 lb/A 75%DF

Time May apply before planting; during or after hilling, when applied postemergence and broadcast by ground, until potatoes are 4 inches tall; or, when applied through a sprinkler irrigation system, until potatoes are 6 inches tall. Thoroughly incorporate the tank-mixture into top 2 to 3 inches of soil mechanically or by sprinkler irrigation.

Remarks Use lower rates on coarse soils. Incorporate immediately after application. When metered into irrigation systems, use 0.5 to 0.75 inch of water/A with a center pivot system. For solid-set wheel lines or hand lines, apply herbicide mixture in 0.5 to 1 inch of water. For best results, wet soil 3 to 4 inches deep during chemigation. See previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Site of action (EPTC) Group 8: lipid synthesis inhibitor but not an ACCase inhibitor; (metribuzin) Group 5: photosystem II inhibitor

Chemical family (EPTC) thiocarbamate; (metribuzin) triazinone

pendimethalin (3.3 EC or Prowl H2O) + EPTC (Eptam)

Rate 1.2 to 2.4 pints/A Prowl 3.3EC or 1.5 to 3 pints/A Prowl H2O + 3 to 3.5 pints/A Eptam

Time Apply and incorporate after planting but before potatoes and weeds emerge. If potatoes are dragged off, apply and incorporate after dragoff but before potatoes and weeds emerge. Mixture may be applied postemergence, through sprinkler irrigation systems only, up to 6-inch stage of potato growth.

Remarks Incorporate immediately after application into top 1 to 2 inches of soil. Use lower rates on coarse soils. Mixture will not control established weeds. See the previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution Do not apply tank-mixture more than once per season. Do not apply if potatoes are stressed by cold, wet, hot, or dry conditions, because crop may be injured.

Site of action (pendimethalin) Group 3: microtubule assembly inhibitor; (EPTC) Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family (pendimethalin) dinitroaniline; (EPTC) thiocarbamate

pendimethalin (Prowl 3.3EC or Prowl H2O) + metribuzin (Sencor 4 or Sencor DF)

Rate Preemergence: use 1.2 to 3.6 pints/A Prowl 3.3EC or 1.5 to 3 pints/A Prowl H2O + 1 to 2 pints/A Sencor 4 or 0.67 to 1.33 lb/A Sencor 75%DF. Early postemergence: use 1.2 to 3.6 pints/A Prowl 3.3EC or + 0.5 to 1 pint/A Sencor 4 or 0.33 to 0.67 lb/A Sencor 75%DF.

Time Apply as a tank-mix, after planting up to the 6-inch stage of potato growth. Mixture also may be applied through sprinkler systems.

Remarks Use lower rates on coarse soils. About 0.5 inch of overhead moisture is needed to move herbicides into sandy soils and up to 0.9 inch into silt-loam soils. For best control, apply before weeds are 1 inch tall. See the previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution Do not apply within 24 hr of applying other pesticides. Do not mechanically incorporate this combination into soil; doing so decreases weed control and may injure potatoes.

Site of action (pendimethalin) Group 3: microtubule assembly inhibitor; (metribuzin) Group 5: photosystem II inhibitor

Chemical family (pendimethalin) dinitroaniline; (metribuzin) triazinone

pendimethalin (3.3EC or Prowl H2O) + metribuzin (Sencor 4 or Sencor DF) + EPTC (Eptam)

Rate 1.2 to 2.4 pints/A Prowl 3.3EC or 1.5 to 4 pints/A Prowl H2O + 0.5 to 1 pint/A Sencor 4, or 0.33 to 0.67 lb/A Sencor 75%DF + 3 to 3.5 pints/A Eptam

Time Apply with ground equipment or through sprinkler irrigation systems, as a tank-mix after planting but before potatoes and weeds emerge. Mixture also may be applied through sprinkler systems postemergence, from crop emergence up to 6-inch stage of potato growth.

Remarks Use lower rates on coarse soils. Tank-mix will not control established weeds; destroy them before application. See the previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information specific to these herbicides.

Caution Do not use on peat or muck soils. Do not apply if potatoes are stressed from cold and wet or hot

and dry conditions, because crop may be injured.

Site of action (pendimethalin) Group 3: microtubule assembly inhibitor; (metribuzin) Group 5: photosystem II inhibitor; (EPTC) Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family (pendimethalin) dinitroaniline; (metribuzin) triazinone; (EPTC) thiocarbamate

rimsulfuron (Matrix) + metribuzin (Sencor 4 or Sencor DF)

Rate Preemergence: use 1 to 1.5 oz/A Matrix + 0.5 to 1.125 pint/A Sencor 4 or 0.33 to 0.75 lb/A Sencor 75%DF. Postemergence: use 1 to 1.5 oz/A Matrix + 0.5 to 1 pint/A Sencor 4 or 0.33 to 0.67 lb/A Sencor 75%DF. Use a nonionic surfactant at 0.125% v/v (1 pint/100 gal) if weeds have emerged.

Time After planting or dragoff but before crop and weeds emerge, or postemergence when weeds are small (less than 1 inch high or across for most species).

Remarks This tank-mixture can improve control of common lambsquarters, Russian thistle, kochia, and wild buckwheat better than rimsulfuron alone. The mixture also is an effective resistance-management tool for ALS-inhibitor-resistant species that are controlled by metribuzin and for triazine-resistant species that are controlled by rimsulfuron. Matrix + Sencor controls hairy nightshade but not cutleaf nightshade. When both hairy and cutleaf nightshade infest a field, tank-mix Matrix + Sencor with Eptam or Dual Magnum or other potato herbicides controlling cutleaf nightshade in order to control both species. If a split application is used (preemergence + postemergence or postemergence + postemergence), do not exceed a total of 0.039 lb ai/A (2.5 oz/A 25%DF) rimsulfuron. Follow the Sencor label recommendations on rates for split applications. See previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution Follow precautions and restrictions on the Sencor label for using these products on metribuzin-sensitive varieties. Using crop oil concentrate or methylated seed oil adjuvants is not recommended with the Matrix + Sencor tank-mix postemergence. Applied postemergence, this mixture may temporarily yellow potato foliage. Under environmental stress (cool, wet, or hot or humid weather), this mixture applied postemergence also may cause leaf malformations and stunted growth. Potatoes recover within 7 to 15 days. To reduce potential injury, apply mixture only if the weather has been sunny for at least 3 successive days. Do not use on seed potatoes unless permitted by a supplemental label. Apply postemergence before potatoes are 14 inches tall and before June 30. Do not apply within 60 days of harvest.

Site of action (rimsulfuron) Group 2: acetolactate synthase (ALS) inhibitor; (metribuzin) Group 5: photosystem II inhibitor

Chemical family (rimsulfuron) sulfonyleurea; (metribuzin) triazinone

rimsulfuron (Matrix) + EPTC (Eptam)

Rate 1 to 1.5 oz/A Matrix + 3.5 to 7 pints/A Eptam

Time Apply preemergence before potatoes and weeds emerge and after dragoff or hilling. To avoid placing Matrix too deep, incorporate the tank-mix with sprinkler irrigation rather than machinery. Apply postemergence, before potatoes are 4 to 6 inches tall, with a nonionic surfactant at 0.125% v/v (1 pint/100 gal spray solution) if weeds have emerged. This tank-mixture may be applied preemergence or early postemergence through chemigation. If your area does not allow sprinkler irrigation incorporation, then apply Eptam and Matrix in a split application. (Semiarid regions of Idaho, Oregon, and Washington allow sprinkler irrigation incorporation.)

Remarks Tank-mix controls crabgrass, hairy nightshade, cutleaf nightshade, and common lambsquarters better than Matrix alone. A three-way mixture of Matrix + Eptam + Dual Magnum or of Matrix + Eptam + Prowl 3.3 EC or H2O may be used after planting but before potatoes and weeds emerge. See the previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution Applied postemergence, Matrix + Eptam may temporarily yellow potato foliage. Under environmental stress (cool, wet, or hot or humid weather), mixture applied postemergence also may stunt growth and cause leaf malformations. Potatoes recover within 7 to 15 days. To reduce injury, apply mixture only if the weather has been sunny for at least 3 successive days. Do not use on seed potatoes unless permitted by a supplemental label.

Site of action (rimsulfuron) Group 2: acetolactate synthase (ALS) inhibitor; (EPTC) Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family (rimsulfuron) sulfonylurea; (EPTC) thiocarbamate

rimsulfuron (Matrix) + EPTC (Eptam at a reduced rate) + MSO or OS/MSO + AMS

Postemergence

Rate 1 to 1.5 oz/A Matrix + 1 pint/A Eptam

Time Apply postemergence. Include either 1% v/v (1 gal/100 gal spray mix) of a methylated seed oil (MSO) or 0.5% v/v (0.5 gal/100 gal spray mix) of an organosilicone modified adjuvant (OS/MSO). Also include 2 lb/A of a spray-grade ammonium sulfate (AMS). This tank-mixture may be applied early postemergence through chemigation.

Remarks For best results, rain or sprinkler irrigation is needed no sooner than 4 hours but not more than 1 day after application. Rain or irrigation should be 0.33 to 1 inch depending on soil texture: in sandy soils, apply at least 0.33 inch; in sandy loam soils at least 0.5 inch; in silt soils at least 0.75 inch; and in clay soils at least 1 inch.

Additional Eptam can be added during the sprinkler incorporation process if desired. Read and follow all use directions, restrictions, and precautions on Eptam 7E label before use. If Eptam label conflicts with this Matrix label, do not use Eptam as a tank-mix partner as described in this section. See the previous entries in this section for application and incorporation methods,

remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution This tank-mixture may cause leaf burn and temporary yellowing if applied in hot weather. Adding fungicides may increase the level of crop injury. In warm, moist weather, the expression of herbicide symptoms is accelerated; in cold, dry weather, expression of herbicide symptoms is delayed and may be more variable in weed control.

Site of action (rimsulfuron) Group 2: acetolactate synthase (ALS) inhibitor; (EPTC) Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family (rimsulfuron) sulfonylurea; (EPTC) thiocarbamate

rimsulfuron (Matrix) + metribuzin (Sencor 4 or Sencor DF) + EPTC (Eptam) or S-metolachlor (Dual Magnum) or pendimethalin (Prowl 3.3EC or Prowl H2O)

Rate 1 to 1.5 oz/A Matrix + 0.5 to 1 pint/A Sencor 4 or 0.33 to 0.67 lb/A Sencor 75%DF + 3.5 to 4.5 pints/A Eptam or 1.5 to 2 pints/A Dual Magnum or 1.2 to 2.4 pints/A of Prowl 3.3EC or 1.5 to 3 pints/A Prowl H2O

Time Apply after planting or after hilling or dragoff but before potatoes or weeds emerge. The Matrix + Sencor + Eptam mixture also may be applied postemergence to small weeds (less than 1 inch high or across) before potatoes are 4 to 6 inches tall.

Remarks Three-way mixtures of Matrix + Sencor + Eptam or Dual Magnum or Prowl 3.3EC or Prowl H2O control hairy nightshade in heavily infested fields better than Matrix + Sencor or Matrix alone. Whether to use Eptam, Dual Magnum, Prowl 3.3EC or Prowl H2O in the three-way mix depends on which other weeds infest the field. See herbicide efficacy tables for common weed species at the end of this section. See the previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution Read and follow all label recommendations for companion herbicides. If recommendations conflict with Matrix label, do not use in a tank-mix with Matrix. Use lower rates on coarse, sandy soils and the higher rate on fine-texture soils. If using the Matrix + Sencor + Eptam mix postemergence, use nonionic surfactant at 0.125% v/v (1 pint/100 gal spray solution). Do not use on seed potatoes unless a supplemental label permits.

Site of action (rimsulfuron) Group 2: acetolactate synthase (ALS) inhibitor; (metribuzin) Group 5: photosystem II inhibitor; (EPTC) Group 8: lipid synthesis inhibitor but not an ACCase inhibitor; (S-metolachlor) Group 15: inhibits very long chain fatty acid synthesis; (pendimethalin) Group 3: microtubule assembly inhibitor

Chemical family (rimsulfuron) sulfonylurea; (metribuzin) triazinone; (EPTC) thiocarbamate; (S-metolachlor) chloroacetamide; (pendimethalin) dinitroaniline

rimsulfuron (Matrix) + S-metolachlor (Dual Magnum)

Rate 1 to 1.5 oz/A Matrix + 1.5 to 2 pints/A Dual Magnum

Time Apply after planting as a delayed preemergence treatment (after dragoff or hilling but before crop and weeds emerge).

Remarks Tank-mix controls small-seed grasses, hairy and cutleaf nightshade, and common lambsquarters better than Matrix alone. A three-way mixture of Matrix + Dual Magnum + Eptam or Prowl 3.3EC or Prowl H2O may be used after planting but before potatoes and weeds emerge. See previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information.

Caution Do not use on seed potatoes unless permitted by a supplemental label.

Site of action (rimsulfuron) Group 2: acetolactate synthase (ALS) inhibitor; (S-metolachlor) Group 15: inhibits very long chain fatty acid synthesis

Chemical family (rimsulfuron) sulfonylurea; (S-metolachlor) chloroacetamide

rimsulfuron (Matrix) + pendimethalin (Prowl 3.3EC or Prowl H2O)

Rate 1 to 1.5 oz/A Matrix + 1.2 to 2.4 pints/A of Prowl 3.3EC or 1.5 to 3 pints/A Prowl H2O

Time Apply after planting or after dragoff but before potatoes and weeds emerge.

Remarks Tank-mix controls kochia (including rimsulfuron-resistant kochia), common lambsquarters, Russian thistle, and crabgrass better than rimsulfuron alone. Matrix + Prowl 3.3 EC or Prowl H2O controls hairy nightshade but does not control cutleaf nightshade. A mixture of Matrix + Prowl 3.3 EC or Prowl H2O + Eptam or Dual Magnum may be used after planting but before potatoes and weeds emerge. Either three-way mixture controls hairy and cutleaf nightshade better than Matrix + Prowl 3.3 EC or Prowl H2O. See previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution Do not use on seed potatoes unless permitted by a supplemental label.

Site of action (rimsulfuron) Group 2: acetolactate synthase (ALS) inhibitor; (pendimethalin) Group 3: microtubule assembly inhibitor

Chemical family (rimsulfuron) sulfonylurea; (pendimethalin) dinitroaniline

sethoxydim (Poast or Poast Plus) + metribuzin (Sencor 4 or Sencor DF)

Rate 1 to 2.5 pints/A Poast; or 1.5 to 2.25 pints/A Poast Plus + 0.75 to 0.94 pint/A Sencor 4 or 0.5 to 0.63 lb/A Sencor 75%DF

Time Apply postemergence to actively growing weeds at growth stage recommended on product labels.

Remarks Always add a nonphytotoxic oil concentrate at 2 pints/A to the spray tank. Do not apply if target grasses include quackgrass, rhizome Johnsongrass, volunteer corn, wirestem muhly, shattercane, red rice, itchgrass, or bermudagrass. Do not cultivate within 5 days before or 7 days after applying the tank-mix. See the previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution Do not apply any tank-mix with Poast other than with metribuzin. Do not apply this tank-mix if grasses to be controlled include rhizome Johnsongrass, quackgrass, Bermudagrass, wirestem muhly, volunteer corn or cereal, shattercane, red rice, or itchgrass. Oil concentrate, required for sethoxydim efficacy, may reduce potato tolerance to Sencor. Do not add nitrogen to this tank-mix. Do not apply to crop under stress or injured by previous herbicide treatment. Apply only if weather has been sunny at least 3 successive days before application. Apply only to russetted or white-skinned varieties that are not early maturing. Do not apply through any type of irrigation system.

Site of action (sethoxydim) Group 1: acetyl CoA carboxylase (ACCCase) inhibitor; (metribuzin) Group 5: photosystem II inhibitor

Chemical family (sethoxydim) cyclohexanedione; (metribuzin) triazinone

S-metolachlor (Dual Magnum) + metribuzin (Sencor 4 or Sencor DF)

Rate 1 to 2 pints/A Dual Magnum + 0.75 to 2 pints/A Sencor 4 or 0.5 to 0.67 lb/A 75%DF

Time Apply as a tank-mixture any time after planting until immediately after last hilling but before potatoes emerge. This combination may be applied as a tank-mix or sequentially.

Remarks Use lower rates on coarse soils or soils low in organic matter; use higher rate on fine-texture or high-organic-matter soils. When applied through a center pivot system, apply proper rates in 0.5 to 1 inch of water (depending on soil type). See the previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution Do not mechanically incorporate this tank-mix into soil. Mechanically cultivating Sencor after treatment decreases weed control and may injure potatoes.

Site of action (S-metolachlor) Group 15: inhibits very long chain fatty acid synthesis; (metribuzin) Group 5: photosystem II inhibitor

Chemical family (S-metolachlor) chloroacetamide; (metribuzin) triazinone

S-metolachlor (Dual Magnum) + pendimethalin (Prowl 3.3EC or Prowl H2O)

Rate 1 to 1.67 pints/A Dual Magnum + 1.2 to 2.4 pints/A. Prowl 3.3EC or 1.5 to 3 pints/A Prowl H2O

Time Apply after planting but before potatoes and weeds emerge.

Remarks Use lower rates on coarse soils and higher rates on finer, heavier soils. The tank-mixture will not control emerged weeds. See the previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution Follow the Dual Magnum and Prowl labels' most restrictive directions, timing, limitations, precautions, and restrictions on use in potatoes.

Site of action (S-metolachlor) Group 15: inhibits very long chain fatty acid synthesis; (pendimethalin) Group 3: microtubule assembly inhibitor

Chemical family (*S*-metolachlor) chloroacetamide; (pendimethalin) dinitroaniline

S-metolachlor (Magnum) + pendimethalin (3.3EC or Prowl H2O) + EPTC (Eptam)

Rate 1 to 1.67 pints/A Dual Magnum + 1.2 to 2.4 pints/A Prowl 3.3EC or 1.5 to 3 pints/A Prowl H2O + 3.5 to 7 pints/A Eptam

Time Apply after planting but before potatoes and weeds emerge.

Remarks Use lower rates on coarse soils and higher rates on finer, heavier soils. The tank-mixture will not control emerged weeds.

Caution Follow Dual Magnum, Prowl 3.3 EC or Prowl H2O, and Eptam labels' most restrictive directions, timing, limitations, precautions, and restrictions on use in potatoes. See the previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Site of action (*S*-metolachlor) Group 15: inhibits very long chain fatty acid synthesis; (pendimethalin) Group 3: microtubule assembly inhibitor; (EPTC) Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family (*S*-metolachlor) chloroacetamide; (pendimethalin) dinitroaniline; (EPTC) thiocarbamate

trifluralin (HFP) + EPTC (Eptam)

Rate 1 to 1.5 pints/A Treflan HFP + 3.5 pints/A Eptam

Time Apply and immediately incorporate after planting but before potatoes and weeds emerge. Or, in areas where potatoes normally are dragged off, apply and incorporate up to or right after dragoff.

Remarks Incorporate with equipment that will not damage potato seed pieces or elongating sprouts. Set incorporation equipment so a layer of treated soil uniformly covers bed and furrow. See previous entries in this section for application and incorporation methods, remarks, cautions, and re-cropping and rotational cropping restriction information for these herbicides.

Caution To help prevent crop injury, carefully follow labels before applying. Potatoes may be injured severely if these herbicides are applied after potatoes emerge if subsequent mechanical incorporation covers potatoes with treated soil.

Site of action (trifluralin) Group 3: microtubule assembly inhibitor; (EPTC) Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family (trifluralin) dinitroaniline; (EPTC) thiocarbamate

POTATOES—Potato Vine Kill

carfentrazone-ethyl (Aim EC40% WDG)

Rate 2 to 3.6 oz/A 3.2 to 5.8 fl oz/A (0.05 to 0.09 lb ai/A). Do not exceed 11.6 oz/A 7.2 oz/A (0.018 lb ai/A) per crop season as a desiccant.

Time For best results, apply when potato crop is in early stages of natural senescence. Desiccation generally is adequate within 14 days after initial treatment. If potato

crop vegetation is actively growing when desiccation begins, two applications may be required to desiccate leaf and stem tissue. If a second application is necessary, wait 7 to 14 days after the first application.

Application methods Ground or aerial. It is essential to thoroughly cover the potato plant. Use enough water to thoroughly cover potato leaves and vines. Ground: Apply Aim EC in at least 20 gal/A of water using 80 or 110 flat-fan nozzles. Vary spray volume and spray pressure according to density of potato canopy and vines to assure thorough spray coverage. Increase spray volume and pressure if potato canopy is dense or if weather is cool, cloudy, or dry. Increased spray volumes enhance performance. Aerial: Apply Aim EC with aerial equipment 5 to 10 gal/A of water using higher volumes on dense potato canopies and vines. Apply 10 ft or less above potato canopy and use low drift nozzles. Apply Aim EC crop oil concentrate at 1% v/v or with a methylated seed oil at a minimum of 1 quart/A or 1% v/v when applied in volumes of more than 20 gal/A. Do not apply this product through any type of irrigation system.

Remarks Dense potato canopy, large plant size, and environmental conditions not conducive to product absorption or activity will reduce initial application efficacy and increase the need for a second application. Use higher rate during cool or cloudy weather or when vine growth is heavy. Do not use high rate if soil moisture is low or temperatures are high, or stem ends may discolor. When Aim is applied alone, grazing and hay operations may proceed with no restrictions.

Caution Do not exceed 0.181 lb ai/A (11.6 fl oz Aim EC) total product per crop season. This total allowable usage applies to all applications made to the field per calendar year including burndown treatments and harvest-aide. Do not exceed 0.018 lb ai/A of Aim per crop season as a desiccant. Preharvest interval is 7 days. Personal protective equipment must be worn for handling and application; see label.

Tank-Mixtures Aim EC may be applied in a tank-mix or as a sequential application with other potato desiccants. Refer to the other product's label for restrictions on tank-mixtures, and observe all label precautions, instructions, and rotational cropping restrictions.

Rotational cropping restrictions Following an application of Aim EC, a treated field may be rotated only to a registered crop (registered crop may be planted at any time). All other crops may be planted after 12 mo.

Site of action Group 14: protoporphyrinogen oxidase inhibitor

Chemical family Triazolinone

diquat (Reglone Desiccant, 2 lb diquat cation/gal)

Rate 1 to 2 pints/A (0.25 lb ai/A to 0.5 lb ai/A) in a single application. May be applied sequentially, but do not exceed a total of 4 pints/A (1 lb ai/A) per season before harvest.

Time Preharvest interval is 7 days. Do not exceed 0.5 lb ai/A (2 pints/A) in a single application. A 5-day interval between sequential applications is recommended.

Application methods Ground or aerial. Apply with a nonionic surfactant at 0.5 to 4 pints/100 gal spray mix. Do not apply through any type of irrigation system.

Remarks Do not apply to drought-stressed potatoes. Reglone is rainfast 30 min after application. Cool, cloudy weather slows Reglone activity but will not affect performance.

Caution A moderately toxic herbicide that requires protective gear for handling and application. Follow all use restrictions and precautions on label. Make last application at least 7 days before harvest. Do not feed forage from treated potatoes to livestock. Avoid applications in extremely dusty conditions because dust coating the plant surface can reduce desiccant activity.

Tank-Mixtures Reglone can be applied in a tank-mixture at time of potato desiccation with fungicides listed on the 2(ee) label and a nonionic surfactant to facilitate harvest. Otherwise, no tank-mixtures (or tank-mixture restrictions) are listed on label.

Rotational cropping restrictions None listed on label.

Site of action Group 22: photosystem I electron diversion

Chemical family Bipyridilium

glufosinate-ammonium (Rely, 1 lb ai/gal)

Rate 3 pints/A (0.375 lb ai/A) in a single application only; do not split application.

Time Beginning of natural senescence of potato vines.

Application methods Apply in 20 to 100 gal/A of water by ground or 5 to 10 gal/A by air. Use enough water to thoroughly cover potato vines. Spray coverage on dense crop canopy will be better with higher water volumes.

Remarks Potato varieties with heavy or dense vines may require an application of another desiccation product to complete desiccation.

Caution Do not apply to potatoes grown for seed. Preharvest interval is 9 days.

Tank-Mixtures No tank-mixtures or tank-mix restrictions on label.

Rotational cropping restrictions Wait at least 30 days (formerly, 70 days) after application to plant wheat, barley, buckwheat, millet, oats, rye, sorghum, and triticale. Wait at least 120 days after the last application to plant rotation crops other than those listed. Corn and soybeans may be planted any time after application.

Site of action Group 10: glutamine synthase inhibitor

Chemical family Phosphinic acid

paraquat (Firestorm, 3 lb paraquat cation/gal)

Rate 0.7 to 1.3 pints/A (0.26 to 0.49 lb ai/A). Use two applications of 0.6 pint/A if vine growth is dense. Use 1.3 pints/A where quick vine kill is desired. Note: Gramoxone Inteon is not labeled for use as a potato desiccant.

Time Begin application when leaves turn yellow. Immature potato foliage tolerates Gramoxone Max. Make split applications at least 5 days apart.

Application methods Ground application only, plus a nonionic surfactant with 75% or more surface-active agent at 0.125% v/v (1 pint/100 gal spray mix) or crop oil concentrate at 1% v/v (1 gal/100 gal spray mix).

Remarks For fresh-market potatoes only. Do not use in potatoes that will be stored or used for seed.

Caution Do not apply to drought-stressed potato vines.

Potatoes must be harvested promptly after desiccation, and consumed or processed immediately. Do not pasture livestock in treated potato fields. Do not exceed 2.7 pints/A per season. Do not use on muck or peat soils.

Tank-Mixtures No tank-mixtures or tank-mix restrictions are listed on the label.

Rotational cropping restrictions All rotational crops may be planted immediately after the last paraquat application.

Site of action Group 22: photosystem I electron diversion

Chemical family Bipyridilium

pyraflufen ethyl (Vida, 0.208 lb ai/gal)

Rate 2.75 to 5.5 fl oz/A (0.0045 to 0.0089 lb ai/A) in a single application. May be applied sequentially, but do not exceed a total of 11 fl oz/A (0.0179 lb ai/A) per season before harvest.

Time For best results, apply when potato crop is in early stages of natural senescence. A second application can be made using ground equipment at a minimum 7-day interval.

Application methods Ground or aerial. Apply in at least 5 gal/A spray mix by air or 20 to 50 gal/A using ground equipment. Use an approved agricultural buffering agent buffering to pH 7.5 or less if using Vida in a water source of \geq pH 7.5. Do not apply Vida through any type of irrigation system.

Remarks A repeat application of Vida or another herbicide or desiccant may be needed under certain climatic conditions to ensure complete desiccation. Vida is rainfast within 1 hour after application. Do not apply within 7 days of harvest.

Caution A corrosive product that can cause irreversible eye damage; requires goggles or a face shield and other protective gear for handling and application. Follow all use restrictions and precautions on label.

Tank-Mixtures Vida may be applied in tank-mixtures or sequentially with other desiccant/harvest aides, fungicide, or insecticide products. Weather, crop conditions, or the presence of certain weeds, crop damaging insects, or diseases will indicate the inclusion of other products in desiccation tank-mixtures. Read and follow label directions and restrictions for each tank-mix product.

Rotational cropping restrictions Do not plant any rotational crops except corn, soybean, or wheat for 30 days after the last Vida application.

Site of action Group 14: protoporphyrinogen oxidase inhibitor

Chemical family Phenylpyrazole

sulfuric acid (93%)

Rate 17 to 28 gal/A

Time Repeat application after 5 days if vines are not completely desiccated. Preharvest interval is 5 days.

Application methods For retail sale and use only by certified applicators or appropriately licensed persons directly under their direct supervision. Apply undiluted sulfuric acid product.

Remarks This material is not as dependent on temperature or other environmental conditions as most other desiccants.

Caution A restricted-use herbicide. Sulfuric acid is very caustic. Requires protective clothing, including dust/mist filtering respirator, chemical-resistant headgear, protective eyewear, chemical-resistant boots, and

waterproof gloves. Applicators must use a closed system/enclosed cab meeting Worker Protection Standards for agricultural pesticides. Adequate supply of water should be immediately available for drenching.

Tank-Mixtures None on label.

Rotational cropping restrictions None on label.

Herbicide Effectiveness on Weeds in Potatoes

Weeds	dimethenamid-P (Outlook)	EPTC (Eptam)	flumioxazin (Chateau)	metribuzin (Sencor)	metolachlor (Stalwart)	S-metolachlor (Dual Magnum)	pendimethalin (Prowl 3.3 or H2O)	ethalfiurain (Sonalan HFP)	trifluralin (Treflan)	rimsulfuron (Matrix) preemergence	rimsulfuron (Matrix) postemergence	clethodim (Select)	sethoxydim (Poast Plus)
Barley, volunteer	G-F	G-F	N	P	—	—	—	P	P	G	G	G	G
Barnyardgrass	G	G	N	F	G	G	G	G	G	G	G	G	G
Bindweed, field	P	P	—	P	—	—	P	—	P	—	P	N	N
Buckwheat, wild	—	F	—	F	—	—	—	G-F	F	P	P	N	N
Cocklebur, common	—	P	—	F	—	—	—	P	P	F	F	N	N
Crabgrass	G	G	—	F	G	G	G	G	G	F	G	G	—
Foxtail spp.	G	G	N	F	G	G	G	G	G	G	G	G	G
Knotweed, prostrate	—	G	—	G	—	—	G	—	G	N	—	N	N
Kochia	F-P	F-P	S	G	F	F	G-F	G-F	G-F	G	G	N	N
Lambsquarters, common	F-P	G	S	G	F	F	G-F	G-F	G-F	F-G	P-F	N	N
Mallow, common	—	P	—	G	F	F	F	—	P	—	—	N	N
Mustard spp.	—	P	S	G	—	—	—	P	P	G	G	N	N
Nightshade, cutleaf	F-G	F-G	S	P	F	F-G	P-F	—	P	N	N	N	N
Nightshade, hairy	G	G	S	F	F	F	F-P	F	P	F-G	G	N	N
Nutsedge, yellow	F	F	—	P	G-F	G-F	P	—	P	—	F	N	N
Oat, volunteer	G-F	G-F	N	G-F	—	—	—	G	G	G-F	G	G	G
Oat, wild	G-F	G-F	N	F-G	F	F-P	F-P	G-F	F	F	G	G	G
Pigweed spp.	G	G-F	S	G	G	G	G-F	G	G	G	G	N	N
Purslane, common	G	G	—	G	G	G	G	G	G	—	F	N	N
Quackgrass	—	G-F	N	F-P	—	—	—	P	P	N	G	G-F	F
Sandbur, field	F-P	G	N	P	G	G	—	G	G	—	—	G	G
Smartweed spp. (annual)	—	P	—	F	P	P	F	—	F-P	—	F	N	N
Sowthistle, annual	—	F	—	G	—	—	P	—	P	—	—	N	N
Sunflower, wild	—	P	—	F	P	P	P	—	P	G	F-G	N	N
Thistle, Canada	—	P	N	F	—	—	—	—	P	—	F	N	N
Thistle, Russian	—	P	—	G	P	P	G	G-F	G-F	P	P	N	N
Wheat, volunteer	G-F	G-F	N	P	—	—	—	F	F	G	G	G	G

G = good F = fair P = poor N = none S = suppression only — = no information available

Response of weeds to any of the listed herbicides may be altered by growing conditions, weed populations, type of irrigation, genetic variations, soil type, pH, organic matter, time of application, and application rate. Ratings may vary from season to season and from site to site. Weed control generally decreases as the season progresses.