

SECTION K.

SUGAR BEET

Joel Felix

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Annual Grass and Broadleaf Weeds

cycloate (Ro-Neet)

Rate 3.0 to 4.0 lb ai/a (0.5 to 0.66 gal/a Ro-Neet 6EC)

Time Apply preplant, at-planting or immediately post-planting of the crop. A preplant application may be made in the fall. Use maximum of 0.66 gal/a if applying in the fall and do not reapply Ro-Neet in the spring.

Remarks Apply Ro-Neet to well-worked soil that is dry enough to permit thorough mixing with incorporation equipment. Mechanically incorporate all applications 2 to 3 inches deep or incorporate with sprinkler irrigation water or enough water to penetrate soil 3 to 4 inches. Begin sprinkler irrigation immediately following application, and complete within a 36-hour period. Use on mineral soils only. Use lower rate on sandy soils and higher dosage on heavier soil. For maximum weed control, plant immediately after application. Do not use a drag behind the planter as it may concentrate Ro-Neet over the seed row and cause crop injury. When cultivating fields where cycloate has been banded in row, use shields to prevent moving untreated soil into treated row. Do not cultivate deeper than the depth of the herbicide incorporation. May be applied with fluid fertilizers or impregnated on dry bulk fertilizers. Restricted entry interval (REI) is 48 hr.

Caution Injury may result on highly saline or alkaline soils. Avoid overlapping herbicide application or injury can result.

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

Chemical family Thiocarbamate

dimethenamid-P (Outlook)

Rate 0.56 to 0.984 lb ai/a (12 to 21 fl oz/a Outlook 6EC)

Time Apply after sugar beets have two true (fully expanded) leaves, otherwise injury may occur. Outlook may also be applied after sugar beets have reached the nine-leaf stage but before the 12-leaf stage for extended control.

Remarks Application rate depends on soil type and organic-matter content. Apply from the two-true-leaf to the 12-leaf growth stage. Two applications per growing season are permitted, but do not exceed 21 fl oz/a per growing season. Outlook will not control emerged weeds. Tank mix postemergence herbicides with Outlook if weeds are present. Outlook may be applied by chemigation, aerially, or at lay-by. The maximum Outlook use rates in a single application are as follows: 12 to 18 fl oz/a on coarse soils, and 14 to 21 fl oz/a on medium or fine texture soils. If applied in a single application, do not exceed 21 fl oz/a. If Outlook is applied in two split applications, maintain a minimum of 14 days between applications and do not exceed a seasonal total of 24 fl oz/a. Application at 2-leaf stage or later may result in temporary leaf injury. Crop injury is possible when tank mixing with herbicides (see label) as well as any adjuvants

such as methylated seed oils. Restricted entry interval (REI) is 12 hr.

Caution Avoid treating light, sandy soils when conditions favor wind erosion. Do not harvest within 60 days of application if Outlook is applied from two-leaf to eight-leaf growth stages. Do not harvest within 95 days of application if Outlook is applied from nine-leaf to 12-leaf growth stages. In situations where Outlook has been applied to sugar beets and crop failure occurs due to adverse weather or other reasons, replanting sugar beets is not recommended.

Site of action Group 15: Long-chain fatty acid inhibitors

Chemical family Chloroacetamide

EPTC (Eptam)

Rate 2 to 3 lb ai/a (2.25 to 3.5 pints/a Eptam 7EC)

Time Apply after first true leaves have formed following cultivation.

Remarks Must be incorporated or metered into sprinkler irrigation lines, or injected on each side of beet row as label directs. If metering into irrigation water, use 2.25 to 3.5 pints/a. If incorporating after application, apply 3.5 pints/a and incorporate 2 to 3 inches deep. If injecting beside the row, use two shanks per row spaced 5.5 inches apart centered on the row and apply at 1.75 pints/a. If using Eptam 20G, apply 15 lb/a. Eptam 7E may be tank mixed with Outlook or trifluralin. Do not exceed 7 total pints per acre per crop. Restricted entry interval (REI) is 12 hr.

Caution Do not apply before first true sugar beet leaves have formed, or within 49 days of harvest.

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

Chemical family Thiocarbamate

ethofumesate (Nortron, Ethotron and many other trade names)

Rate 0.125 to 3.75 lb ai/a (0.25 to 7.5 pints/a Nortron 4SC or Ethotron 4SC)

Time Apply preplant or preemergence followed with a light incorporation or sprinkler irrigation (0.5 to 0.75 inch of water). May also apply to bedded soil in the fall. Ethofumesate can be applied postemergence in a tank-mix with glyphosate or Betamix.

Remarks For preplant and preemergence applications, apply 2.25 to 7.5 pints/a (broadcast equivalent), depending on soil type and organic matter content. Do not apply more than 6 pints/a (broadcast equivalent) on soils with less than 3 percent organic matter. Do not mechanically incorporate under sprinkler irrigation. Effective on most broadleaf weeds, but only fair on nightshade. Good on most grasses, kochia, Russian thistle, and redroot pigweed. Use the higher rate within each soil texture

category (see label) on the finer texture soils and/or where Kochia or barnyardgrass are expected to be a problem. Refer to the product label to determine compatibility with liquid fertilizers. Restricted entry interval (REI) is 12 hr.

Caution Temporary injury and/or carryover problems may occur at higher rates. Do not exceed a total of 1 gal/a (broadcast equivalent) in a single season. If soil-applied, do not plant any crop other than sugar beets or ryegrass within 12 months after applying. May rotate six months after low-rate postemergence applications of 12 oz/a or less. Moldboard-plow soil the next year before planting other crops.

Site of action Group 16: unknown

Chemical family Benzofuran

glyphosate (Roundup and many other trade names)

Use only on Roundup Ready sugar beets

Rate 0.75 to 1.125 lb ae/a (22 to 32 fl oz/a Roundup PowerMax 4.5SL)

Time Apply preemergence through canopy closure.

Remarks Use only on Roundup Ready sugar beets. Be aware that glyphosate is formulated as 3, 4, 4.17, 4.5, and 5 lb ae/gal; be sure to use the correct amount of herbicide. In Roundup Ready sugar beets, up to 5.96 lb ae/a (170 fl oz/a Roundup PowerMax) may be applied in one year; up to 3.71 lb ae/a (106 fl oz/a Roundup PowerMax) may be applied preplant, at planting, and preemergence; up to 1.97 lb ae/a (56 fl oz/a Roundup PowerMax) may be applied from emergence to eight-leaf stage; and up to 1.54 lb ae/a (44 fl oz/a Roundup PowerMax) may be applied between eight-leaf stage and canopy closure. The maximum rate for any single application from crop emergence until the eight-leaf stage is 1.125 lb ae/a (32 fl oz/a Roundup PowerMax). It is strongly recommended not to use less than 0.75 lb ae/a for weed control to reduce the potential for development of glyphosate-resistant weeds. The maximum rate for any single application between the 8-leaf stage and canopy closure is 0.77 lb ae/a. Controls only emerged weeds and has no residual weed control. Use up to 2 lb ae/a glyphosate to control perennial weeds. The addition of 1 to 2 percent ammonium sulfate (AMS) by weight, or 8.5 to 17 lb/100 gal spray solution may increase the performance of glyphosate, particularly with hard water or spraying during drought conditions. If using AMS for hard water conditions, mix water and AMS before adding glyphosate. See individual glyphosate labels for amount of surfactant and water applied per acre. Up to four sequential applications of this product may be made with at least 10 days between applications. Restricted entry interval (REI) is 4 or 12 hours depending on the glyphosate product used.

Caution Do not use glyphosate for spot treatment in emerged sugar beet crops unless they are Roundup Ready. Do not plant crops other than those listed on label for 30 days after applying. Do not harvest within 30 days after application.

Site of action Group 9: inhibits EPSP synthase

Chemical family glycine

glyphosate + S-metolachlor (Sequence)

Rate 1.64 to 2.63 lb ai/a (2.5 to 4 pints/a Sequence 5.25EW)

Time Apply postemergence from 2 true-leaf stage to canopy closure.

Remarks From the sugar beet 2-leaf to 8-leaf growth stage, do not exceed 2.5 pints/a on coarse soils and 3 pt/a on medium

and fine soils for any single application. From the 8-leaf stage to canopy closure, do not exceed 2.5 pints/a on all soil types for any single application. Do not make more than 4 postemergence applications of Sequence, which must be 10 days apart. If used with other glyphosate products, do not exceed 1.95 lb ae/a glyphosate from the 2-leaf to the 8-leaf and 1.56 lb ae/a glyphosate from the 8-leaf to canopy closure. Sequence contains 0.28 lb ae glyphosate per pint of product. The addition of 1 to 2 % ammonium sulfate (AMS) by weight, or 8.5 to 17 lb/100 gal spray solution may increase the performance of glyphosate, particularly with hard water or spraying during drought conditions. If using AMS for hard water conditions, mix water and AMS before adding glyphosate. See individual glyphosate labels for amount of surfactant and water applied per acre. If rainfall or irrigation is not received within 7 days after application, residual weed control may be reduced. Up to four sequential applications of this product may be made with at least 10 days between applications. Heavy rainfall or irrigation shortly after application may require re-treatment. Restricted entry interval (REI) is 24 hr.

Caution Applications to sugar beet varieties that are not glyphosate resistant will result in severe crop injury and reduced yields. Do not harvest within 60 days of the last application. Do not exceed 7 pints/a per season applied postemergence. Do not apply through any irrigation system.

S-metolachlor (Dual Magnum and many other trade names)

Rate 0.95 to 1.59 lb ai/a (1 to 1.67 pints/a Dual Magnum 7.62EC or 0.95 to 1.59 pints/a Moccasin 960 8EC)

Time Apply postemergence after first-true-leaf stage.

Remarks Apply at 0.95 to 1.26 lb ai/a on coarse soils with less than 3% organic matter, 1.26 to 1.59 lb ai/a on medium soils, 1.26 to 1.59 lb ai/a on fine soils with less than 3% organic matter, or 1.59 to 1.9 lb ai/a on fine soil with greater than 3% organic matter. More than one postemergence application may be applied, but the total should not exceed 2.47 lb ai/a. Weeds present at the time of application will not be controlled. The addition of spray adjuvants such as crop oil concentrates or methylated seed oil can increase the risk of crop injury. Restricted entry interval (REI) is 24 hr.

Caution If a crop treated with S-metolachlor is lost, any crop on the product label or on a supplemental S-metolachlor label, may be replanted immediately provided that the rate applied to the previous crops was not greater than the labeled rate for the crop to be replanted. Sugar beets may not be replanted because they can be injured while emerging. Do not harvest within 60 days after application.

Site of action Group 15: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family Chloroacetamide

paraquat (Gramoxone SL 2.0 and various other trade names)

Rate 0.5 to 1 lb ai/a (2 to 4 pints/a Gramoxone SL 2.0)

Time Apply to emerged weeds 1 to 6 inches tall, but before crop emerges.

Remarks Form seedbeds as far ahead of treatment as possible to permit maximum weed emergence. Use the higher rate for heavier weed populations. It is essential to obtain complete coverage of target weeds to obtain good control. Can be used in fallow bed/stale seedbed for weed control. Seeding should be

done with a minimum amount of soil disturbance. Add a non-ionic surfactant containing 80% or more active ingredient at a minimum of 0.125% v/v (1 pint/100 gal spray). A nonphytotoxic crop oil concentrate or methylated seed oil containing 15 to 20% approved emulsifier may be used at 1% v/v (1 gal/100 gal spray). Rain occurring 15-30 minutes or more after application will have no effect on Gramoxone SL activity. Restricted entry interval (REI) is 24 hr.

Caution A restricted-use herbicide. Wear a long-sleeved shirt, long pants, shoes and socks, protective eyewear, chemical-resistant gloves (Category A), and a NIOSH-approved respirator with any N, R, P, or HE filter when handling and spraying. Avoid contact with eyes and skin. Do not breathe spray mist. Do not allow spray to drift from target site.

Site of action Group 22: photosystem I electron diversion

Chemical family Bipyrindilium

pronamide (Kerb SC)

Seed in Oregon only

Rate 1 lb ai/a (2.5 pints lb/a SC, 2 lb/a 50WP)

Time Apply postemergence to weeds and beets in November or December, after beets have at least three to five true leaves.

Remarks Special local needs label OR-110015 (SC) and OR-020029 (50W). Controls most annual grasses, volunteer grains, and chickweed. Does not control most broadleaves. Restricted entry interval (REI) is 24 hr.

Caution A restricted-use herbicide. Avoid spraying areas that may drain onto fields planted to grass or cereal crops. Do not graze or feed crop residues.

Site of action Group 3: microtubule assembly inhibitor

Chemical family Benzamide

phenmedipham + desmedipham (Betamix or Sugarbeet Mix)

Rate 0.31 to 1.32 lb ai/a (0.95 to 4 pints/a Betamix or Sugarbeet Mix 1.3EC)

Time Apply low rates (0.25 to 0.33 lb ai/a) two to three times at about 1-week intervals. Refer to label for application rates based on sugar beet growth stage. The first application may be made when sugar beets are in cotyledon to one-leaf stage, but weeds must have no more than one true leaf. Higher rates are required when weeds are in two- to four-leaf stage. In such cases, sugar beets must have at least two true leaves and temperatures must be between 50°F and 80°F.

Remarks Controls common lambsquarters, mustard species, and nightshade. Some control of green foxtail. Weak on Kochia and pigweed. Multiple micro-rate applications of Sugarbeet Mix in tank mixture with UpBeet, Stinger, and modified seed oils may be applied to control early germinating weeds. Do not spray while dew is present. Rain within 6 hours of application may reduce weed control. Restricted entry interval (REI) is 24 hr.

Caution Sugar beets may be injured if stressed or if air exceeds 80°F at application. Frost within 3 days prior to application or 7 days following treatment could cause beet injury. Do not harvest within 75 days of application. Do not apply through any type of irrigation system. Do not exceed 12 pints/a per growing season.

Site of action (both) Group 5: photosystem II inhibitor

Chemical family (both) Phenylcarbamate

trifluralin (Treflan and several other trade names)

Rate 0.5 to 0.75 lb ai/a (1 to 1.5 pints/a with any 4-lb ai/gal formulation)

Time Apply at layby when soil has been pushed around beets after thinning (i.e., when beets are 2 to 6 inches tall or in four- to six-leaf stage).

Remarks Cover exposed beet roots with soil before applying to reduce possibility of girdling. Susceptible to photodegradation if not immediately incorporated. Incorporate with power tiller, rolling cultivator, or flexline harrow. After using trifluralin, plow deeply before planting any sensitive crop. Restricted entry interval (REI) is 12 hr.

Caution Do not plant oats. See label for crop rotation restrictions.

Site of action Group 3: microtubule assembly inhibitor

Chemical family Dinitroaniline

triflurosulfuron-methyl (UpBeet)

Including beets grown for seed

Rate 0.25 to 0.5 oz ai/a (0.5 to 1 oz/a UpBeet 50DF)

Time Apply to sugar beets any time after planting and weed emergence. Use higher rates as weed size or population increases.

Remarks Tank mix with other broadleaf herbicides such as Betamix Sugarbeet Mix or Stinger. Use at least two sequential applications 5 to 10 days apart or as weeds germinate. For best results, weeds should be small (cotyledon to four true leaves), actively growing, and not under stress. If UpBeet is applied alone or combined with Stinger, include a nonionic surfactant or crop oil concentrate. Since UpBeet has no soil activity, only emerged weeds will be controlled. Rain within 6 hours may reduce weed control. For best results, tank mix with glyphosate, Betamix, or Sugarbeet Mix for two sequential applications. Restricted entry interval (REI) is 4 hr.

Caution Temporary chlorosis may occur under stressful growing conditions. Pre-harvest interval is 60 days. Do not exceed 2.5 oz/a in one season.

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

Chemical family Sulfonylurea

Annual Grass

clethodim (Select, Select Max and several other trade names)

Rate 0.094 to 0.25 lb ai/a (6 to 16 fl oz/a Select 2EC) or 0.068 to 0.243 lb ai/a (9 to 32 fl oz/a Select Max 0.97EC)

Time Apply to actively growing grasses 1 to 6 inches tall.

Remarks Apply when the first grass weed species in a mixed grass weed population reaches recommended growth stage for treatment. Be aware that clethodim is formulated as 0.97, 2, and 3 lb ai/gal; be sure to use the correct amount of herbicide. For glyphosate resistant volunteer corn use Select Max at 6 fl oz/a on volunteer corn up to 12 inches tall, 9 fl oz/a on 24 inch tall volunteer corn and 12 fl oz/a on 36 inch tall volunteer corn. With Select Max always use nonionic surfactant at 0.25% v/v (1 quart/100 gal spray solution). With Select 2EC always use nonionic surfactant at 0.25% v/v (1 quart/100 gal spray solution) or crop oil concentrate at 1 quart/a with ground applications, or 1% v/v (1 gal/100 gal spray solution), but not less than 1 pint/a

by air. Add 2.5 to 4 lb/a spray grade ammonium sulfate (AMS) fertilizer in addition to crop oil concentrate may be added to enhance quackgrass, wild oats, volunteer cereals and volunteer corn control with Select 2EC. In arid regions where irrigation is used to supplement limited rainfall, clethodim should be applied within 7 days after irrigation. In general, a second application of clethodim will control perennial grasses more effectively than a single application. Make the second application to actively growing grass 2 to 3 weeks after emergence of new growth. Cultivation of treated grasses 7 days prior to or within 7 days after application may reduce weed control. Do not apply if rain is expected within 1 hour of application. Refer to label for information on tank mixing with broadleaf herbicides. Restricted entry interval (REI) is 24 hr.

Caution Pre-harvest interval is 40 days. Do not apply more than 64 fl oz/a (0.5 lb ai/a) per season of Select Max.

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

Chemical family Cyclohexanedione

fluazifop (Fusilade DX)

Rate 0.094 to 0.375 lb ai/a (6 to 24 fl oz/a Fusilade DX 2EC), depending on weed species

Time Apply to actively growing grasses 1 to 6 inches tall.

Remarks Apply with 0.5% to 1% crop oil concentrate or once-refined vegetable oil concentrate containing 15% to 20% approved emulsifier (0.5 to 1 gal/100 gal spray solution) or 0.25% to 0.5% v/v (1 to 2 quarts/100 gal spray solution) non-ionic surfactant containing at least 75% surface-active agent. Diammonium phosphate (aqueous ammonium polyphosphate), commonly sold as a solution (10-34-0) can be added to the spray mixture at a rate of 2 pints/a. Refer to label for information on tank mixing with broadleaf herbicides. Maintain a minimum of 14 days between applications. Where irrigation is used as part of normal cropping practice, best results are obtained when fluazifop is applied within 7 days after irrigation. Fusilade is rainfast 1 hour after application. Restricted entry interval (REI) is 12 hr.

Caution Do not use flood-type or other spray nozzle tips that deliver coarse, large droplet sprays. Do not harvest sugar beets within 90 days after last application. Do not exceed 48 fl oz/a per year. Do not harvest sugar beets within 90 days of last application.

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

Chemical family Aryloxyphenoxy-propionate

quizalofop P-ethyl (Assure II or Targa)

Rate 0.034 to 0.083 lb ai/a (5 to 12 fl oz/a Assure II 0.88EC or Targa 0.88EC)

Time Apply to actively growing grasses from three-leaf to early tillering stage.

Remarks Controls annual grass weeds and volunteer small grains. Can use quizalofop at 2.5 fl oz/a for preplant burndown of grass weeds. Subsequent flushes of grass require additional treatment. For volunteer glyphosate resistant corn, quizalofop may be tank mixed with glyphosate. Use 4 fl oz/a for up to 12 inch volunteer corn, 5 fl oz/a for 12 to 18 inch volunteer corn, and 8 fl oz/a on 18 to 30 inch corn. Use a petroleum-based crop oil concentrate at 1% v/v (4 quarts/100 gal spray solution) containing at least 80% high-quality petroleum or modified vegetable seed oil with at least 15% surfactant emulsifiers. Or use a nonionic surfactant at 0.25% v/v (1 quart/100 gal spray solution) containing

at least 60% nonionic surfactant with a hydrophilic/lipophilic balance (HLB) greater than 12. Ammonium nitrogen fertilizer such as 28% or 32% N used at 2 quarts/a or 2 lb/a of spray-grade ammonium sulfate (AMS) may be added to the spray mixture, but is not required. For aerial applications, apply 0.5% v/v (2 quarts/100 gal spray solution) of crop oil concentrate. Do not apply if rain is expected within 1 hour of application. Restricted entry interval (REI) is 12 hr.

Caution Do not apply more than 4 applications per acre per season. Allow 7 or days between application. **Do not exceed 25 fl oz/a per season.** Do not mix with broadleaf herbicides unless listed on the label. Do not apply through any type of irrigation equipment. Do not harvest within 45 days after application.

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

Chemical family Aryloxyphenoxy-propionate

sethoxydim (Poast)

Rate 0.19 to 0.47 lb ai/a (1 to 2.5 pints/a Poast 1.5EC)

Time Apply to actively growing grasses at grass growth stage indicated on label.

Remarks See label for application rates, which differ by grass species and size. Sugar beets at all stages of growth are tolerant. In irrigated areas, apply 2 to 4 days after irrigation for best results. Always add oil concentrate at 2 pints/a. Annual bluegrass and fine fescues are not controlled. Spray volunteer grain up to 4 inches tall, but before tillering. Spray wild oat when 2 to 4 inches tall. Sethoxydim is most effective on actively growing grasses that are not stressed. Always add Sundance HC spray adjuvant at 1 pint/a, or a crop oil concentrate (COC) to the spray tank at 2 pints/a. Add urea ammonium nitrate (UAN) at 4 to 8 pint/a, or ammonium sulfate (AMS) at 2.5 lb/a for controlling crabgrass, volunteer corn, and all volunteer cereals. Volunteer cereals emerging from May through July may be partially or incompletely controlled because of unfavorable conditions at application time. Can be tank mixed with Betamix without COC, UAN or AMS. Add nitrogen to COC or MSO to improve control. Do not apply if rain is expected within 1 hour of application. Restricted entry interval (REI) is 12 hr.

Caution Do not exceed 2.5 pints/a Poast per application or 5 pints/a Poast in 1 year. Apply at least 60 days before harvest.

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

Chemical family Cyclohexanedione

Quackgrass

clethodim (Select, Select Max and several other trade names)

Rate 0.125 to 0.25 lb ai/a (8 to 16 fl oz/a Select 2EC) or 0.091 to 0.121 lb ai/a (12 to 32 fl oz/a Select Max 0.97EC)

Time Apply to actively growing grasses 4 to 12 inches tall.

Remarks Apply when the first species in a mixed-grass weed population reaches the recommended growth stage for treatment. Be aware that clethodim is formulated as 0.97, 2, and 3 lb ai/gal; be sure to use the correct amount of herbicide. Always use crop oil concentrate at 1% v/v (1 gal/100 gal spray solution). Adding 2.5 to 4 lb AMS fertilizer enhances quackgrass control. Do not apply to grasses that are stressed due to moisture, temperature, and/or very low humidity. Do not apply if rain is expected within 1 hour of application. See label on tank mixing

with broadleaf herbicides. Restricted entry interval (REI) is 24 hr.

Caution Do not apply within 40 days of harvesting beets. Do not apply more than 64 fl oz/a per season.

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

Chemical family Cyclohexanedione

quizalofop P-ethyl (Assure II or Targa)

Rate 0.069 to 0.083 lb ai/a (10 to 12 fl oz/a Assure II 0.88EC or Targa 0.88EC)

Time Apply to actively growing quackgrass 6 to 10 inches tall.

Remarks Two applications more effectively control quackgrass than one application. Use a petroleum-based crop oil concentrate at 1% v/v (4 quarts/100 gal spray solution) or a nonionic surfactant at 0.25% v/v (1 quart/100 gal spray solution). For aerial applications apply 0.5% v/v (2 quarts/100 gal spray solution) of crop oil concentrate. Do not apply if rain is expected within 1 hour of application. Restricted entry interval (REI) is 12 hr.

Caution Do not apply more than 28 fl oz/a per season. Do not mix with broadleaf herbicides unless listed on the label. Do not apply through any type of irrigation equipment. Do not harvest with 45 days after application.

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

Chemical family Aryloxyphenoxy propionate

sethoxydim (Poast)

Rate 0.47 lb ai/a first application + 0.28 lb ai/a second application (2.5 + 1.5 pints/a Poast 1.5EC)

Time Apply first when quackgrass is 6 to 8 inches tall. Apply again when regrowth or new growth is 6 to 8 inches tall.

Remarks Quackgrass is suppressed during crop season, but little long-term control will result. Use an oil concentrate with herbicide. Add nitrogen to COC or MSO to improve control. Cultivate 7 to 14 days after first or sequential applications. Do not apply if rain is expected within 1 hour of application. Restricted entry interval (REI) is 12 hr.

Caution Do not exceed 2.5 pints/a Poast per application or 5 pints/a Poast in 1 year. Apply at least 60 days before harvest.

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

Chemical family Cyclohexanedione

fluazifop (Fusilade DX)

Rate 0.125 to 0.188 lb ai/a (8 to 12 fl oz/a Fusilade DX 2EC)

Time Apply to actively growing quackgrass 6 to 10 inches tall.

Remarks **Make two applications: the first one at 6 to 10 inches tall and the second one 2 to 3 weeks later, but before quackgrass exceeds 10 inches tall.** Apply with 1% crop oil concentrate or once-refined vegetable oil concentrate containing 15% to 20% approved emulsifier (0.5 to 1 gal/100 gal spray solution). Fusilade is rainfast 1 hour after application. Restricted entry interval (REI) is 12 hr.

Caution Do not use flood-type or other spray nozzle tips that deliver coarse, large droplet sprays. Do not exceed 48 fl oz/a per season. Do not harvest sugar beets within 90 days of last application.

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

Chemical family Aryloxyphenoxy propionate

Certain Annual Broadleaf Weeds and Canada Thistle

clopyralid (Stinger)

Rate 0.094 lb ae/a to 0.188 lb ae/a clopyralid (0.25 to 0.5 pint/a Stinger 3SC) to control annual broadleaf weeds. To control Canada thistle and suppress perennial sowthistle, use 0.125 to 0.25 lb ae/a clopyralid (0.5 to 0.66 pint/a Stinger 3SC).

Time Apply when beets have 2 to 8 true leaves. For annual weed control from weed emergence up to the 5 leaf stage and for Canada thistle, apply after most basal leaves emerge, but before bud stage.

Remarks May be tank mixed with Betamix or to control additional weeds. For most effective control of Canada thistle, apply broadcast to entire infested area and for best results, do not cultivate thistle patches. Apply at 10 gal/a or higher total spray volume. Restricted entry interval (REI) is 12 hr.

Caution Wheat, barley, oats, grasses, field corn, or sugar beets may be planted any time following treatment. Do not plant alfalfa, asparagus, canola (rapeseed), *Brassica* species grown for seed, cole crops, dry beans, soybeans, grain sorghum, mint, onions, popcorn, safflower, sunflower, sweet corn, or strawberries for 12 months after applying clopyralid. In areas with 18 or more inches of annual precipitation (not including irrigation), alfalfa, asparagus, dry beans, canola (rapeseed), *Brassica* species grown for seed, grain sorghum, mint, onions, popcorn, sweet corn, soybeans, strawberries, and sunflowers may be planted 12 months after applying clopyralid. Cole crops, lentils, peas, potatoes (including potatoes grown for seed), safflower, or broadleaf crops grown for seed (excluding *Brassica* species) should not be planted for 18 months after treatment unless previous experience has shown no crop injury with the minimal 12-month rotation interval. In areas with less than 18 inches average annual precipitation (not including irrigation), do not plant alfalfa, dry beans, soybeans, sunflowers, lentils, peas, potatoes (including potatoes grown for seed), or broadleaf crops grown for seed (excluding *Brassica* species) until 18 months after applying clopyralid. Sensitive crops may suffer injury or yield loss up to 4 year after application. Re-treat as necessary but do not exceed 0.66 pint/a per year. Preharvest interval is 45 days for beet roots and tops.

Site of action Group 4: synthetic auxin

Chemical family Pyridine

Herbicide Effectiveness¹ on Weeds in Sugar Beet

Weeds	cycloate (Ro-Neet)	ethofumesate (Norton or Etho SC)	glyphosate (Roundup)	dimethenamid-P (Outlook)	phenmedipham + desmedipham (Betamix)	clopyralid (Stinger)	triflusalufuron (UpBeet) ²	clethodim (Select)	quizalofop (Assure II) ³	sethoxydim (Poast)	EPTC layby (Eptam)	trifluralin
Barley, volunteer	F	F	E	P	P	P	P	G	G	P-F	P	P
Barnyardgrass	G	G	E	E	P-F	P	P	E	E	E	G	G
Bindweed, field	P	P	F	P	P	P	P	P	P	P	P	P
Buckwheat	P	F-G	G	P	F-G	E	G	P	P	P	F	F
Cocklebur	P	P	G	P	F	E	F	P	P	P	P	P
Crabgrass	G	F-G	E	G	P	P	P	E	E	F	G	G
Dodder	P	P	E	P	P	P	P	P	P	P	P	P
Foxtail	G	G	E	E	F	P	P	E	E	E	G	G
Knapweed, Russian	P	P	P	P	P	G	P	P	P	P	P	P
Knotweed	P	P	P	F	F	F	G	P	P	P	G	G
Kochia	P	F-G	G-E	F	P-F	P	G	P	P	P	F	F
Lambsquarters	E	G-E	F-G	F-G	E	F	G	P	P	P	G	F-G
Mallow	P	P	P-F	P-F	P	P	F	P	P	P	P	P
Mustard	P	G	G	P	G	P	G	P	P	P	P	P
Nightshade, black	G	F-G	G	G	F-G	F-G	G	P	P	P	F-P	P
Nightshade, hairy	G	F-G	G-E	E	G-E	F-G	F	P	P	P	G	P
Nutsedge, yellow	F	P	F	F-G	P	P	P	P	P	P	F	P
Oats, volunteer	F	F	E	F	P	P	P	G	G-E	P-F	P	P
Oat, wild	F	F	E	F	P	P	P	G-E	G-E	G-E	F-G	F
Pigweed	E	G-E	G-E	E	G-E	P	G-E	P	P	P	F-G	G
Purslane	G	F-G	G-E	F-G	G	P	F	P	P	P	G	G
Quackgrass	F	P	F-G	P	P	P	P	G3	G3	F	F	P
Sandbur	G	P	E	G	P	P	P	E	G	—	G	G
Smartweed	P	F-G	F-G	P	P	G	G	P	P	P	P	P-F
Sowthistle	P	G	G	F	E	G	G	P	P	P	F	P
Sunflower	P	P	F-G	P	F	E	P	P	P	P	P	P
Thistle, Canada	P	P	P-F	P	P	E	P	P	P	—	P	P
Thistle, Russian	P	F-G	F-G	F	F	P	P	P	P	P	P	F-G
Wheat, volunteer	F	F	E	P	P	P	P	G	G	P-F	F	F

E = excellent G = good F = fair P = poor — = limited information

¹ Response of weeds to any of the listed herbicides may be altered by growing conditions, weed population, type of irrigation, genetic variation, soil type, pH, organic matter, time of application, or application rate. Ratings may vary from season to season and from site to site. Weed control generally decreases as the season progresses.

² UpBeet controls these weeds when tank mixed with Betamix.

³ Requires two applications of Assure II for quackgrass.