

What's Available for '10

Listing of Herbicides Currently Labeled for Use in Sunflower

The following listing of herbicides and use recommendations comes from the *2010 Chemical Weed Control Guide* published by the Kansas State University Agricultural Experiment Station and Cooperative Extension Service.

Similar guides are published by universities in other major sunflower-producing states. While most of the information provided here would be applicable to other states as well as Kansas, growers in those states are encouraged to consult their own university's 2010 sunflower weed control information. Relevant websites for North Dakota, South Dakota, Nebraska — and Kansas — include:

- *North Dakota:* www.ndsu.edu/weeds/
 - *South Dakota:* http://agbiopubs.sdstate.edu/pub_description.cfm?Item=FS525OS
 - *Nebraska:* <http://cropwatch.unl.edu/web/weed/home>
 - *Kansas:* www.agronomy.ksu.edu/extension/
- The website of the National Sunflower Association also contains significant information on weed issues and control in sunflower. Go to www.sunflowerusa.com. Click on "Growers," then "Weeds."
- As always, "the label is the law." Read and follow label directions when using any of these products.

Herbicide & Lbs/Ac Active Ingredient Needed	Formulated Product/Ac*	Comments / Limitations
— Burndown, Preplant and/or Preemergence —		
EPTC 2 to 3	2.5 to 3.5 pt Eptam 7E or 10 to 15 lbs Eptam 20G	Controls many grasses and certain broadleaf weeds. Apply just before planting and incorporate immediately. Use the low rate on light-textured soils.
Ethalfluralin 0.56 to 1.125	1.5 to 3 pt Sonalan	Controls grasses more effectively than broadleaf weeds. Apply before planting and incorporate within 48 hours. Can control shattercane. Follow label directions.
Glyphosate 0.38 to 0.75 lb/ac	1 to 2 pt of 3 lb ae/gal Glyphosate	Apply to control emerged weeds before or after sunflower planting but before crop emergence. Glyphosate products differ in concentration and adjuvant requirements. Refer to specific product labels for rate and adjuvant recommendations. Condition spray solution with 1 to 2% spray-grade ammonium sulfate by weight (8.5 to 17 lb/100 gal water) before adding glyphosate to the tank. Follow label directions.
S-metolachlor 0.95 to 1.91	1 to 2 pt Dual Magnum or Charger Basic	Controls grasses and some small-seeded broadleaf weeds pre-emergence. Can be applied from 30 days before planting to crop emergence. Can be incorporated shallowly, but deep incorporation or excessive soil disturbance at planting may result in poor weed control. Use lower rates on coarse soils with low organic matter and the higher rates on fine-textured soils with higher organic matter. Do not allow livestock to graze or feed in treated area.
Paraquat 0.63 to 1.0	2.5 to 4 pt Gramoxone Inteon	A restricted-use pesticide. Apply before crop emergence for control of emerged weeds. Paraquat is a contact herbicide and does not have soil activity. Always apply with a nonionic surfactant to 0.5% v/v.
Pendimethalin 0.5 to 1.5	1.2 to 3.6 pt Pendimethalin 3.3* or 1.5 to 3 pt Prowl H₂O	Controls grass weeds more effectively than broadleaves. Pendimethalin can be applied from 60 days before planting until crop emergence. Incorporation generally improves weed control in conventional tillage systems. Extremely cool, wet weather following application and sunflower planting can result in problems with sunflower emergence and injury. Do not feed forage or allow livestock to graze in treated fields. Follow label directions. (Con't)

Sulfentrazone 0.094 to 0.25	3 to 8 oz Spartan 4F	Apply in the fall, preplant or pre-emergence to sunflower for control of pigweeds, kochia, Russian thistle and certain other broadleaf weeds. The lower rates are for coarse-textured soils with low organic matter, and the higher rates are needed on fine-textured soils with higher organic matter content. Preplant treatments 14 days or more before planting have generally provided better weed control and crop tolerance than pre-emergence applications at planting time. Follow label directions.
Sulfentrazone + Carfentrazone 0.07 to 0.21 + 0.008 to 0.023	3 to 8.5 oz Spartan Charge	Apply in the fall, preplant or pre-emergence to sunflower for burndown and residual control of pigweeds, kochia and other broadleaf weeds. The lower rates are for coarse-textured soils with low organic matter, and the higher rates are needed on fine-textured soils with higher organic matter content. May be tank mixed with glyphosate for improved grass burndown activity.
Sulfentrazone + Glyphosate 0.09 to 0.16 + 0.49 to 0.84	21 to 36 oz Spartan Advance	Apply in the fall, preplant or pre-emergence to sunflower for burndown and residual control of pigweeds, kochia and other weeds. The lower rates are for coarse-textured soils with low organic matter, and the higher rates are needed on fine-textured soils with higher organic matter content. Supplemental glyphosate is recommended for adequate weed control with the lower Spartan Advance application rates.
Trifluralin 0.5 to 1	1 to 2 pt Trifluralin 4E*	Controls grasses more effectively than broadleaf weeds. Apply before planting and incorporate within 24 hours. Can control shattercane. Follow label.

— *Postemergence* —

Clethodim 0.07 to 0.25	6 to 16 oz Select Arrow or Volunteer , or 9 to 16 oz Select Max	Controls annual and perennial grasses. Apply when grasses are actively growing but before they exceed size limits listed on the label. Apply Select and comparable products with crop oil concentrate at 1% v/v. Apply Select Max with nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v plus ammonium sulfate at 2.5 to 4 lbs/ac. Weed control is reduced if applied when grasses are under drought stress. Do not apply within 70 days of harvest. Do not allow grazing or use treated plants for feed or forage.
Imazamox 0.031	4 oz Beyond	Apply to Clearfield sunflower only. Beyond will severely injure or kill non-Clearfield sunflower. Can be applied from the V2 through the V8 stage of sunflower for control of susceptible broadleaf weeds before they exceed 3 inches, and susceptible grasses before they exceed the 4- to 5-leaf stage. Apply with nonionic surfactant and nitrogen fertilizer additives. May not control ALS-resistant kochia, pigweed or shattercane biotypes. Temporary yellowing of sunflower plants may occur shortly after application of Beyond, especially when applied to crops growing under environmental stress. Do not plant corn, sorghum, cotton or non-Clearfield sunflower within 9 months of Beyond application.
Quizalofop 0.03 to 0.075	5 to 12 oz Assure II or Targa	Controls many annual and perennial grasses, including shattercane, volunteer corn and volunteer wheat. Apply with 1% v/v crop oil concentrate or 0.25% v/v nonionic surfactant. Weed control is reduced if applied when weeds are under drought stress. Do not graze or feed forage, hay or straw from treated areas to livestock. Do not apply within 60 days of sunflower harvest.
Sethoxydim 0.1 to 0.28	1 to 2 pt Poast	Controls annual and perennial grasses. Apply when grasses are growing actively but before they reach size limits listed on the label. Apply to annual grasses up to 8 inches, volunteer corn up to 20 inches, shattercane from 6 to 18 inches, volunteer wheat before tillering, and rhizome johnsongrass from 15 to 25 inches tall. Higher rates are recommended in the western third of Kansas than in the eastern part of the state. Always apply with crop oil concentrate or Dash. Weed control is reduced if applied when grasses are under drought stress. Do not apply within 70 days of harvest. Do not use treated plants for feed or forage. Follow label directions and precautions.
Tribenuron 0.0078 to 0.0156	0.25 to 0.5 oz Express TS	Apply to ExpressSun sunflower only. Express will severely injure or kill non-ExpressSun sunflower. Can be applied between the 1-leaf and the beginning of bud stage of sunflower growth for control of small, actively growing broadleaf weeds. Apply with methylated seed oil at 1% v/v. May not control ALS-resistant biotypes of kochia or pigweed. Temporary yellowing of

sunflower plants may occur shortly after application of Express — especially when applied to crops growing under environmental stress. Do not apply within 70 days of sunflower harvest. Do not feed forage from treated areas or allow livestock grazing within 7 days of application. Allow 30 days between application and feeding hay from treated areas to livestock.

— Harvest Aids —

Glyphosate 0.75 lb ae	22 oz Roundup WeatherMax, Roundup Original Max or Roundup PowerMax	Apply by ground or aerial equipment to control annual and perennial weeds and help facilitate harvest. Apply when sunflower seeds reach physiological maturity (when seed moisture is 35% or less). For many sunflower varieties, this stage is when the backs of heads are yellow and bracts are turning brown. Allow a minimum of 7 days between treatment and harvest for livestock feeding.
Paraquat 0.3 to 0.5	1.2 to 2 pt Gramoxone Inteon	A restricted-use pesticide. Always apply with nonionic surfactant. Apply with ground or aerial equipment 7 to 21 days before harvest to desiccate sunflower plants, broadleaf weeds and grasses. Apply when sunflower seeds reach physiological maturity (when seed moisture is 35% or less). For many varieties, this stage is when backs of heads are yellow and bracts are turning brown. Do not allow grazing of treated areas or feed treated forage.
Saflufenacil 0.022 to 0.044	1 to 2 oz Sharpen	Apply by ground or aerial equipment to desiccate sunflower in order to facilitate earlier harvest. Apply when sunflower reaches physiological maturity (when seed moisture is less than 35%). For many sunflower varieties, this stage is when the backs of heads are yellow and bracts are turning brown. Apply with 1% v/v methylated seed oil plus 1.25 to 2.5% v/v liquid urea ammonium nitrate fertilizer or ammonium sulfate at 8.5 to 17 lbs/100 gal of spray solution. Allow a minimum of 7 days between treatment and sunflower harvest. Do not apply on sunflower grown for seed production.
Sodium chlorate 6	1 gal Defol 6	Apply by ground or aerial equipment to facilitate harvest and reduce moisture in mature seed heads. Apply 7 or more days before harvest when seed heads are fully mature. Do not allow grazing of treated fields or feed treated forage. ■

Avoiding Crop Injury When Using 'Assert' for Mustard

Numerous producers have applied the postemergent herbicide Assert® to control infestations of wild mustard in their sunflower. And it works. Grower experience and university studies through the years have confirmed the effectiveness of Assert on mustard when applied at the proper stage of sun-

Below: Symptoms of Assert injury to a young sunflower plant.



Photo: Rich Zollinger / NDSU

flower growth and under the right environmental conditions.

For growers using a Clearfield or ExpressSun variety, Beyond and Express will do a good job of controlling wild mustard. With non-herbicide-tolerant varieties, however, the only option other than Assert is Spartan — and Spartan only suppresses mustard (40-50% control, according to NDSU).

While Assert is an important component of the sunflower herbicide arsenal, use of this product also carries risk of serious crop injury — particularly if applied under high temperature and high humidity. Variety, growth stage, weather conditions, humidity, spray volume and additives all can influence the herbicide's safety for sunflower. Damage can range from plant stunting to head deformation.

North Dakota State University advises applying Assert only when air temperature (Fahrenheit) *plus* relative humidity totals less than 150. NDSU also cautions against using Assert on sunflower that is under drought or heat stress.

Recent years' research by Brian Jenks, weed scientist with the NDSU North Central Research Extension Center at Minot, has investigated several facets of sunflower crop injury and yield after treatment with this herbicide. In 2009 specifically, Jenks looked at Assert when applied with NIS, compared to a tank mix with a grass herbicide (Select®) and oil adjuvant (MSO); at the influence of an early application (four- to six-leaf stage) versus a late one (10-leaf stage); and at the effect of spray boom height above the sunflower canopy. Study results can be viewed at www.ag.ndsu.edu/NorthCentralREC/weed-science-research. ■