

AGRICULTURAL GUIDE

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Weed control

Herbicides for conservation tillage cropping systems

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Reliable weed control is necessary for successful reduced tillage cropping. In the future, energy sources for farm power may be in short supply and surely will become more costly in relation to the variable costs of other materials put into crop production.

With conventional cropping systems, preparatory tillage requires more power than other operations. But if you eliminate heavy tillage in the cropping sequence, smaller tractors are adequate for planting and power needs. Cropping with minimum tillage reduces the number of trips across the field. This saves fuel, time and labor; prolongs the life of equipment; and gives an operator flexible options. For instance, the probability of getting into the field as weather dictates may be better. Also, the crop refuse remaining on the soil surface protects the top soil and holds the moisture supply in the seed zone and deeper in the soil. Microbial action on chemicals is greater.

Herbicide treatments are necessary to control weeds growing at planting time and weeds emerging later in the growing season.

Corn production

Paraquat or Gramoxone + Surfactant*

Sold under a restricted use label, paraquat is a highly toxic herbicide.

Paraquat is a **contact** herbicide for use on growing weeds or other green plant material. It eliminates competition with the planted crop by quickly drying the weed foliage. It is not a **residual** herbicide; that is, it binds tightly to the soil and does not control weeds emerging after the treatment. Perennial weeds and some annual species are not killed by paraquat because it does not absorb into the stems and roots of treated plants. It works well on young, growing plants with-

out extensive vegetative and root growth. Control is usually less effective in cloudy weather and when the air temperature is below 50 to 68 degrees F (10 to 20 degrees C).

Paraquat is a 2 pounds per gallon liquid formulation with no surfactant. Make sure sprays of paraquat contain a surfactant when they are used alone or in a mixture with other herbicides. Use $\frac{1}{4}$ to $\frac{1}{2}$ pound per acre of paraquat with 1 to 2 pints of non-ionic surfactant per 100 gallons of spray mixture. One or 2 pints of paraquat per acre are adequate for most small, annual weeds actively growing when sprayed.

Annual weed species controlled. Following is a partial list of weeds controlled.

Cocklebur (*Xanthium strumarium*)
Morning glory (*Ipomoea spp.*)
Velvetleaf (*Abutilon theophrasti*)
Lambsquarter (*Chenopodium album*)
Pigweeds (*Amaranthus spp.*)
Barnyard grass (*Echinochloa crusgalli*)
Foxtails (*Setaria spp.*)
Crabgrass below 6 inches (*Digitaria spp.*)

Resistant annual species.

Smartweeds (*Polygonum spp.*)
Docks (*Rumex spp.*)
Knotweed (*Polygonum aviculare*)
Fleabanes (*Erigeron spp.*)
Horseweed (*Conyza canadensis*)

Perennial species response. Paraquat applied alone is ineffective for control of perennial weeds (both grass and broad-leaved species).

Paraquat or Gramoxone + Atrazine + Surfactant

• The addition of atrazine enhances the control of growing weeds.

*Gramoxone is an alternate brand of paraquat.

- Atrazine provides residual control of weeds after penetrating into the soil surface.

- Apply ¼ to ½ pound of paraquat plus 2 pounds of atrazine plus 1 to 2 pints of non-ionic surfactant on loam and clay loam soils.

- Broad-leaved weeds escaping the initial treatment may be controlled with sprays of 2,4-D amine in the corn after emergence.

Note. The amount of atrazine used on high organic matter soils (above 3 percent) must be increased for effective weed control. Apply up to 3 pounds active ingredient per acre on the dark bottomland soils of the corn belt.

Paraquat or Gramoxone + Cyanazine (Bladex) with Surfactant

Cyanazine performance is similar to atrazine for short-season weed control. It is superior to atrazine where fall panicum is a problem. Cyanazine has a shorter life in the soil and does not cause residue problems in rotational crops. Three pounds of cyanazine per acre are required for effective weed control. Do not apply cyanazine with suspension fertilizers.

Paraquat or Gramoxone + Atrazine (Aatrex) + Simazine (Princep) with Surfactant

Simazine is more effective on fall panicum and on some other weeds than atrazine. Equal mixtures of atrazine with simazine, up to 1½ pound active ingredient each, may be used on dark, prairie soils with medium to higher organic matter (over 3 percent). Be sure to use 1 to 2 pints of non-ionic surfactant in the spray mix to aid wetting and quick foliar action of the herbicides.

Roundup (Glyphosate)

When applied as recommended under the conditions described on the labels, Roundup controls many emerged weeds. It also gives pre-emergence control of many annual weeds when corn will be planted directly into a cover crop, established sod, or in previous crop residues.

Refer to specific product labels for crop rotation restrictions and for cautionary statements about all products used in these tank mixtures. See label for application rates.

Roundup + Lasso

Use the following tank mixtures on most soils but not on sand or loamy sand soils.

- Roundup + Lasso + Atrazine 4L
- Roundup + Lasso + Bladex 4L
- Roundup + Lasso + Princep 4L
- Roundup + Atrazine 4L + Princep 4L + Lasso

Apply these tank mixtures in 10 to 20 gallons of water per acre after planting or during planting. Apply so that the planter does not disturb the treated soil. Do not apply these mixtures after crop emergence.

Reduced control may result if Roundup is used in tank mixtures with fluid fertilizers.

Bronco (Roundup + Lasso)

Apply as tank mixes:

- Bronco + Atrazine 4L
- Bronco + Bladex 4L
- Bronco + Princep 4L

Three-way tank mix for heavy infestations or hard-to-control weeds

- Bronco + Atrazine + Princep 4L

See respective labels for application rates for various soil textures.

2,4-D (various brands)

For broad-leaved weed control, apply before planting. A rate of ¾ to 1 pound per acre is adequate for most weed populations. Use ester formulations.

Liquid nitrogen

Water-based liquid nitrogen sprays of urea plus ammonium nitrate (NH_4NO_3) will substitute under certain conditions, for some of the paraquat in mixtures with the atrazine or cyanazine. Add 1 to 2 pints of non-ionic surfactant to the spray mixture to enhance the activity of the nitrogen and paraquat mixture.

Post emergence

Banvel (Dicamba + 2,4-D)

Apply ¼ to ½ pound 2,4-D amine + ½ to 1 pint Banvel for broad-leaved weed control.

Make application after broadleaf weeds emerge and on corn up to 36 inches or 15 days before tassel emergence, whichever comes first. When corn is 8 inches or more in height, direct the spray beneath the lower leaves of the corn onto the weeds and soil.

Basagran (Bentazon) + Atrazine + oil

Apply ½ to ¾ quart Basagran + 1 to 1½ pint atrazine 4L plus 1 quart crop oil per acre. Apply only once per season. Seed corn producers should consult seed corn companies about tolerance of inbred lines.

Soybean production

Soybeans are sensitive to shading during early seedling growth. Shade from thick-standing stubble or weed vegetation at the time of planting can inhibit stand establishment and early seedling growth. To control competing weeds at planting and during the growing season, apply herbicide at planting time to ensure that the residual herbicide will get onto the soil surface as soon as possible before weeds emerge.

Rotary mowing of weed growth is effective for control of broad-leaved weeds at planting time, but a residual herbicide treatment is absolutely necessary to continue control of weeds during the growing season.

Granular herbicides are not more effective than liquid sprays for a minimum tillage soybean culture.

Early planting of soybeans increases the likelihood of rainfall soon after planting. Rain aids germination and washes the residual herbicides off the vegetation onto the soil surface.

Herbicide combinations are needed for control of both grasses and broad-leaved weed species at planting time and for the balance of the growing season.

Preplanting

Paraquat or Gramoxone + Lorox or Metribuzin + Dual, Lasso or Surflan with a Surfactant

Fields with weed growth or those planted to small grains both to stabilize the soil and for supplementary pasture are suitable for planting early soybeans.

This tank mix will effectively control emerged annuals but a postemergent herbicide may be applied to control weeds emerging later. The paraquat component in the tank mix controls most emerged annual weeds and will temporarily suppress perennials. Mixture component rates vary with soil types. See labels for specific rates.

Do not apply these herbicide mixtures in high phosphate or suspension fertilizers.

Roundup + Lorox or Metribuzin + Dual or Lasso or Surflan + Surfactant

Substituting Roundup for paraquat provides control of some perennial weeds along with the annuals. Do not apply on soils with a pH of 7.4 or above, if Metribuzin is used. Also, do not apply in suspension or high phosphate fertilizer. See labels for application rates.

Bronco + Lorox or Metribuzin

Bronco is a premix of Roundup and Lasso. It's designed for control of both grasses and broad-leaved species. Lorox, Sencor, or Lexone in the tank mix provide soil residual activity with Lasso for weeds germinating after spraying. See labels for specific application rates.

Postemergence

Complete foliar coverage is essential.

Basagran

Apply when susceptible weeds are small and actively growing. Apply with crop oil or other oil concentrate. See label for application rates. The addition of 2,4-DB will enhance performance of Basagran.

Blazer 2S

A surfactant is not required if this herbicide is applied in 20 gallons of water per acre. It's highly effective for annual morning glory control. For escaped grasses, add ½ pint Triton AG-98 to 100 gallons of water. The use of an oil concentrate is not recommended. The

addition of no more than 2 fluid ounces of 2,4-DB will enhance performance.

Basagran + Blazer 2S

This tank mix provides control of a broader array of species than either herbicide by itself. For certain hard-to-kill weed species, the addition of an oil concentrate will improve performance. Tank mix rates vary as each company has different recommendations. 2,4-DB is also labeled and can be used with this combination. See labels for application rates.

Dyanap

This herbicide is for broad-leaved weeds. Apply after soybeans have reached the second trifoliolate stage, but before they reach 20 inches. It's most effective if weeds are under 3 inches. Apply 2 to 4 quarts Dyanap per acre, depending upon weed growth and density.

Hoelon

This herbicide is for volunteer corn and some other annual grasses. Do not mix with any other product or additive. Apply 2¹/₃ to 3¹/₃ pints in a minimum of 20 gallons of water.

Roundup (Glyphosate)

Apply with a ropewick or roller applicator when weeds are at least 6 inches taller than the beans. Use 1 gallon of Roundup in 2 gallons of water (33 percent solution) to control several broad-leaved and grass species.

Poast

Apply Poast to actively growing grasses before they reach 8 inches in height. Rates vary from ½ to 2 pints per acre. Always add a non-phytotoxic (not poisonous to plants) oil concentrate to the spray solution. Soybeans are tolerant to Poast at all stages of growth. Do not apply within 70 days of harvest.

Fusilade (Fluazifop-butyl)

Nearly all grasses are susceptible to Fusilade when they are actively growing. Higher rates are needed as grasses approach maturity. Soybeans are tolerant at all stages of growth. Add a crop oil concentrate or a non-ionic surfactant to the spray solution.

Soybeans in wheat stubble

To conserve soil, water, and time, plant soybeans in wheat stubble immediately after harvest. Use a variety with good seedling vigor from a late maturity group, if you're planting a determinate variety.

A lack of seedbed moisture may make the soil so hard that a heavy planter with special coulters in front of the seed-furrow opener will be needed to get the proper seeding depth of 1½ to 2 inches. A disk-type opener may be adequate if there has been rain within two weeks before wheat harvest.

Planting soybeans by airplane in the maturing wheat has failed more often than it has been successful in establishing a good stand.

Depending on the soil texture, one of the herbicide combinations listed in this section may be applied either during or after planting. Unless growing weeds are present in the stubble, using paraquat or Roundup in the spray mixtures will not be beneficial or economical.

Do not delay planting so that weed shoots left at harvest re-foliate. Early planting is usually more beneficial than control of new foliage by the paraquat or Roundup in later plantings.

— Grain sorghum (milo) production —

Grass weeds are very competitive with grain sorghum seedlings. Better herbicides are needed to control grasses in all sorghum crops. Paraquat controls emerged seedling grass weeds before the sorghum emerges, but it does not provide residual action to control weeds germinating later. Using *Concep-* or *Screen-*treated seed allows safe use of either Dual or Lasso for annual grass control.

For desiccation and residual control of annual broadleaf weeds and grasses where sorghum will be planted directly into previous crop residues, apply 1 to 2 pints Ortho Paraquat CL. Two to 3 pounds of Atrazine 80 Wettable per acre may be applied as a broadcast ground spray before, during, or after planting, but it must be applied before crop emergence. Refer to the Atrazine 80 Wettable label for directions, limitations, and cautions. The label also has a list of weeds controlled by pre-emergence activity of Atrazine. Apply 20 to 30 gallons of diluted spray per acre.

Add Ortho X-77 Spreader (non-ionic) at 16 to 32 fluid ounces per 100 gallons of diluted spray. Water or nitrogen solutions may be used as a carrier. Add Atrazine to the spray tank first, mixing thoroughly in the carrier. Then add Paraquat and Ortho X-77 Spreader (non-ionic). Continuous agitation is recommended. This herbicide tank mixture will not control volunteer sorghum or shattercane which emerges after application.

Tank-mix with Atrazine and Igran

Use this tank-mix instead of Paraquat + Atrazine when better pre-emergence control of barnyardgrass, crabgrass, and fall panicum is desired. Apply 1 to 2 pints Ortho Paraquat CL plus 2 to 2½ pounds Igran 80W per acre as a broadcast ground spray before, during, or after planting, but before crop emergence. Weed control is often superior from application made approximately one week before planting.

Use low rates of Atrazine and Igran on medium soils and higher rates on heavy soils. Refer to Atrazine and Igran labels for directions, limitations, cautions, and for a list of weeds controlled by pre-emergent activity of Atrazine and Igran. The addition of 2,4-D (ester) at ½ pound active ingredient per acre sprayed may aid in the suppression of perennial broadleaf weeds and annual broadleaf weeds with excessive growth before application. Refer to the 2,4-D label for directions, limitations, and cautions. Apply 20 to 40 gallons of diluted spray per acre. Add Ortho X-77 Spreader (non-ionic) at 16 to 32 fluid ounces per 100 gallons of diluted spray. Use only water or nitrogen solutions as a carrier. Add Igran to spray tank first, mixing thoroughly in carrier. Then add Atrazine, 2,4-D (if used), Paraquat, and Ortho X-77 Spreader (non-ionic). Continuous agitation is recommended.