

1980 Recommendations for Chemical Weed Control in Soybeans

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Part II (Pre-emergence and Postemergence)

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Federal regulations on the use of herbicides change frequently; thus farmers should stay informed on the status of label clearance. Based on available information, recommendations in this guide conform to laws and regulations at the time of writing.

You must read and understand the label on herbicides you plan to use. Rates lower than indicated on label are legal to use.

About Recommendations and Application

Recommendations in this guide are based on research and comparative performance over a period of years. However, herbicide performance depends on many factors that cannot be controlled or foretold. (See UMC Guide 4903, "Factors Affecting Herbicide Performance.") For that reason, results may vary widely from those normally expected. *Recommendations do not and cannot imply satisfactory performance in all cases.* There is some risk in using any herbicide.

Because herbicide prices vary widely from time to time, cost was not considered in these recommendations. You should check on the cost of alternative weed control treatments and compare costs with expected performance for your specific situation.

Comparative performances, with emphasis on weed control and crop tolerance, are major factors in herbicide evaluation. Because no herbicide is superior to others in all circumstances, no effort has been made to list treatments in any order of preference in this guide.

Herbicide rates are given on the basis of active ingredient (unless otherwise indicated) per acre actually treated. Treated acres will be fewer than acres of crop in the field if the herbicide is applied in a band. **LABEL RATES TAKE PRECEDENCE OVER RATES INCLUDED IN THIS GUIDE.**

The label on the container gives the amount of active ingredient in the commercial product. The amount of commercial product to use is easy to calculate when you know the active ingredient content of the commercial product. Divide the pounds of active ingredient needed by pounds per gallon (for liquids) or percent active ingredient expressed as a decimal (for dry materials).

Example 1: Lasso contains 4 lbs. active ingredient (alachlor)/gal. How much Lasso do you apply to get 3 lbs. of alachlor per acre?

$$\frac{3 \text{ lbs. active ingredient needed}}{4 \text{ lbs./gal. in commercial product}} = \frac{3}{4} \text{ gal. or 3 qts./A}$$

Example 2: Lorox contains 50% active ingredient. How much Lorox do you apply to get 0.75 lb./A linuron?

$$\frac{0.75 \text{ lb. active ingredient needed}}{.50 \text{ (% as decimal) in commercial product}} = 1.5 \text{ lbs. Lorox/A}$$

To compute the area actually treated when applying herbicides in a band, first divide the width of the band by the row width of the crop. For example:

$$\frac{\text{Band width: 10 inches}}{\text{Row width: 30 inches}} = \frac{1}{3}$$

This means 1/3 of each acre of crop actually is treated. One-third x acres of crop in field = acres in field actually treated.

Pre-emergence (Surface) Treatments

Alachlor (Lasso): Alachlor gives good control of most annual grasses and satisfactory control of many broadleaved weeds. Alachlor does not leach as readily as some other herbicides and consequently is effective under relatively high rainfall. This herbicide is effective in controlling fall panicum. Recommended rates for the liquid formulation are:

soil	lbs./A active ingredient	
	less than 3% organic matter	more than 3% organic matter
light: sand through sandy loam	2	2
medium: loams	2.5	3
heavy: silt loam	3	3.5

The soil surface should be freshly worked and free of weeds at the time of application.

Lasso II is a 15% granule containing alachlor. See the label for rates of the granule.

Alachlor (Lasso) + Linuron (Lorox): Adding linuron to alachlor provides effective control of many broadleaved weeds not controlled by alachlor alone. Determine rates by type and organic matter content of soil. Recommended rates:

soil	lbs./A active ingredient	
	1-3% organic matter alachlor + linuron	more than 3% organic matter alachlor + linuron
sandy loam	1.5 + 0.5	1.5 + 0.5-0.75
medium loams	2 + 0.5-0.75	2.25 + 0.75-1
heavy silty clay loam through clay	2.25 + 1	2.25 + 1.25 to 3 + 1.5

Do not use on sand or loamy sand or on soil with less than 1% organic matter. The margin of crop safety for this combination is narrow. Follow all instructions and cautions on the labels of both herbicides.

Control of cocklebur, jimsonweed and velvet leaf is less dependable than that for most weeds. Control of morning-glory is usually poor.

Alachlor (Lasso) + Metribuzin (Sencor or Lexone): This combination normally gives a broad spectrum of weed control. Control of cocklebur, jimsonweed and velvet leaf is less dependable than that for most other weeds. Control of morning-glory is usually poor. Rates:

soil	lbs./A active ingredient	
	less than 3% organic matter alachlor + metribuzin	more than 3% organic matter alachlor + metribuzin
sandy loam	2 + ¼	2 + ⅜
medium: loam, silt loam, silt, sandy clay loam and sandy clay	2 + ⅜	2 + ½
heavy: silty clay loam, clay loam, silty clay, and clay	2 + ½	2½ + ½

Do not use on sand or loamy sand or on soil with less than 1% organic matter. Follow all instructions and cautions on the labels of both herbicides.

Do not use on sands or loamy sands containing less than 2% organic matter. Do not apply on soils with a pH higher than 7.4. Carry-over atrazine residues and metribuzin on soybeans are additive, so treating in sequence may cause crop injury. Do not plant crops other than soybeans for 120 days after application.

Alachlor (Lasso) + Dinoseb (numerous trade names): Dinoseb is sometimes called "dinitro" or "DNBP." The margin of safety between weed control and crop injury for dinoseb is considered to be too narrow for it to be used alone. However, adding it to alachlor at a reduced rate may improve broadleaved weed control over alachlor alone at reasonable cost. Tank mix rates:

soil texture	Dinoseb	Lasso
sandy loam	3.0 lbs.	2.0 lbs.
silt loam	4.5 lbs.	2.0-2.5 lbs.
heavy clay	4.5 lbs.	2.5-3.0 lbs.

Provide continuous agitation to keep spray uniformly mixed.

Alachlor (Lasso) + Chlorpropham (Furloe): Adding chlorpropham to alachlor provides for control of smartweed as well as certain other broadleaved weeds. Rates:

soil	lbs./A active ingredient	
	less than 5% organic matter alachlor + chlorpropham	more than 5% organic matter alachlor + chlorpropham
sand and sandy loam	2 + 2	2 + 2
loam, silt loam, silt	2-2.5 + 2-3	3-2.5 + 5-3
clay, clay loam, silty clay	2.5-3 + 2-3	2.5 + 3

Observe all instructions and cautions on the label of both herbicides.

Chloramben (Amiben): Under favorable conditions of moisture, chloramben has performed well in controlling both grass and broadleaved weeds.

Apply 2-3 lbs. active ingredient/A. The 3 lb. rate generally is required on heavy clay loam or clay soil types or any soils with more than about 3% organic matter. Since chloramben is highly soluble in water, it may lose some effectiveness under

excessive rainfall on light soils. A cultivation then may be necessary.

Chloramben normally has a wide safety margin on soybeans.

Linuron (Lorox): Linuron is an effective weed killer, but the margin of safety between satisfactory weed control and corn injury is narrow. Sprayer calibration and application must be accurate for satisfactory results. Since soil organic matter and soil texture affect linuron performance, no single application rate is satisfactory for a field with major variations in soil type.

Linuron should not be used on sandy soils. Plant soybeans 1¾ inches deep to reduce hazard of injury.

Linuron is useful in combinations with other herbicides. Do not plant crops other than corn or soybeans within four months following linuron application. Rates:

soil	lbs./A of active ingredient	
	0.5-2% organic matter*	2-5% organic matter*
sandy loam	½-⅝	⅝-1½
silt loam	⅝-1⅙	1⅙-2
clay loam	⅔-1⅓	1⅓-2½

*Interpolate rates for intermediate levels of organic matter.

The hazard of crop injury makes use of this treatment on soils with less than 1% organic matter a questionable practice. The treatment generally is not used on soils with more than 4% organic matter because of less dependability and the high rates required.

Metribuzin (Sencor or Lexone): This herbicide generally gives good control of most annual grass weeds. Barnyard grass may not be controlled well. It usually controls most small-seeded weeds and some of the large-seeded ones. Metribuzin is superior to some other herbicides for control of jimsonweed, smartweed, velvetleaf, common ragweed, sesbania, cocklebur and prickly sida. Purslane and morning-glory often escape control by metribuzin.

Accuracy of application is essential as the margin of safety between weed control and crop injury is narrow. Some temporary crop injury can be expected. Metribuzin has performed well in mixtures with other herbicides. Effects of carry-over atrazine residues in the soil and of metribuzin on soybeans are additive, so together they may cause crop injury.

soil	lbs./A of active ingredient		
	less than 2% organic matter	2-4% organic matter	more than 4% organic matter
light: sandy loam, loamy sand	do not use	⅜	½
medium: loam, silt loam, silt, sandy clay, sandy clay loam	⅜-½	½-⅝	⅝-¾
heavy: silty clay, silty clay loam, clay, clay loam	½-⅝	⅝-¾	¾-7/8
heavy: silty clay, silty clay loam, clay, clay loam in Mississippi Delta only	¾	7/8	1

Do not use on sandy soils. Do not use on light soils (sandy loam and loamy sand) containing less than 2% organic matter. Plant the soybeans at least 1½ inches deep. Do not apply more than once per season. Do not use immature plants or plant residues after harvest for feed or forage.

Propachlor (Ramrod or Bexton): Ramrod is available in a flowable form, as a 65% wettable powder and as a 20%

granular formulation. Propachlor has federal clearance only for soybeans grown for seed for planting. Soybeans grown in soil treated with propachlor cannot be sold for processing for feed or food products. Do not graze or feed forage from treated areas. Alachlor is generally more effective than propachlor in overall performance except on heavy soils. Rate: 3.9-4.88 lbs. active ingredient/A.

Naptalam + Dinoseb (Dyanap or Klean-Krop): These commercial products contain 2 lbs. naptalam + 1 lb. dinoseb per gal. The combination is reasonably effective on many annual grass and broadleaved weeds. The safety margin is narrow, so accurate application is essential. The risk of crop injury is greater when application is followed by heavy rains. Low temperature or use on light (coarse textured) soils increases the risk.

The combination may be applied anytime from planting to emergence of the soybeans. It is most effective if the weeds are emerging at the time of application. This combination applied as a follow-up treatment complements some soil incorporated treatments by improving annual broadleaved weed control. Apply 3 lbs. naptalam/A + 1½ lbs. dinoseb/A (1½ gals. commercial product/A).

Do not use on shallowly planted seed.

Naptalam + Dinoseb (Dyanap) + Alachlor (Lasso): This mixture usually controls a rather broad spectrum of both grass and broadleaved weeds. The margin of safety between weed control and crop injury is narrow. Use 3 lbs. naptalam/A + 1½ lbs. dinoseb (1½ gal. Dyanap)/A + 2 lbs. alachlor (½ gal. Lasso)/A on most soils. On light, sandy soils, rates should be decreased 25%.

Do not use on shallowly planted soybeans. Heavy rainfall following application increases the risk of crop injury, especially if accompanied by cool temperatures or on light (coarse textured) soil. Follow all instructions and cautions on the labels of both products used in the mixture.

Oryzalin (Surflan) + Linuron (Lorox): Oryzalin is primarily a grass controlling herbicide while linuron controls several broadleaved weeds. Control of black nightshade, common morning-glory, cocklebur, prickly sida, spotted spurge and sicklepod may be erratic, depending on soil temperature, time of germination, depth of seed in soil and amount of moisture. Apply within two days after planting. Do not spray over top of emerged soybeans. A half-inch rain or more is necessary to activate the herbicide combination. Rates: Apply 0.6-1.25 lbs. Oryzalin/A + 0.66-1.66 lbs. Linuron/A. Do not use on sandy soils or on soils over 3% organic matter.

Oryzalin (Surflan) + Metribuzin (Sencor): This tank mix combination is designed to give a broad spectrum of weed control. Oryzalin is primarily a grass killer and metribuzin controls several broadleaved weeds. Control of cocklebur, morning-glory and giant ragweed may be erratic depending on soil temperature, time of germination, depth of seed in soil and amount of moisture.

A half-inch or more of rain, or the equivalent in overhead irrigation, is needed to activate this herbicide combination. If this amount of rain does not occur within seven days, incorporate the herbicide into the top inch of the soil with a rotary hoe, rolling cultivator or similar implement. Cultivation may be needed to control the emerging annual weeds and grasses and to improve herbicidal effectiveness. Rates: Apply 0.57-1.25 lbs. Oryzalin/A + 0.33-0.5 lb. Metribuzin/A. Do not use on sandy soils, or on soils over 3% organic matter.

Oryzalin (Surflan) + (Naptalam + Dinoseb): This tank mix may be applied up to two days after planting, but before beans emerge. Do not use on soils with more than 3% organic matter. Do not use treated vines for feed or forage. Apply 6 qts. Naptalam + Dinoseb/A and 1-2 Surflan 75 WP/A as a tank mix at planting and up to the soil cracking stage. Use

Surflan at 1 lb./A on sandy soil, 1½ lbs./A on medium soils and 2 lbs./A on heavy soils.

Metochlor (Dual 6E): Apply metochlor to soil surface at time of planting, but before weeds or soybeans emerge. Rates:

soil texture	Broadcast rate per acre	
	3% organic matter	3% organic matter or greater
coarse: sand, loamy sand, sandy loam	1.5-2.0 lbs.	2.0 lbs.
medium: loam, silt loam, silt	2.0-2.5 lbs.	2.0-2.5 lbs.
fine: silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2.0-2.5 lbs.	2.5-3.0 lbs.
muck or peat soils	DO NOT USE	

Metolachlor (Dual 6E) + Linuron (Lorox):

soil texture	0.5 - 3.0% O.M.		3% O.M. or more	
	Dual 6E	Lorox	Dual 6E	Lorox
coarse	1.25 lbs.	1.0 lb.	1.5 lbs.	1-1.5 lbs.
medium	1.5 lbs.	1-1.5 lbs.	2.0 lbs.	1.5-2 lbs.
fine	2.0 lbs.	2.0 lbs.	2.0-2.5 lbs.	2.5-3.0 lbs.

Apply after planting, but before weeds or soybeans emerge.

Postemergence Treatments

Bentazon (Basagran) Overtop: This herbicide is effective only on some annual broadleaved weeds. It is most effective on very small weeds (2- to 3-leaf stage) that are actively growing.

Bentazon often produces injury symptoms on soybeans, but normally the yield is not decreased significantly. Optimum rates depend on the kinds and sizes of weeds treated:

weed	application rates for weed growth stage	
	¾ lbs./A (¾ qt./A)	1 lb./A (1 qt./A)
cocklebur	2-6 leaf stage	6-10 leaf stage
wild mustard	2-6 leaf stage	6-10 leaf stage
Pennsylvania smartweed	2-6 leaf stage	6-10 leaf stage
velvet leaf	2-4 leaf stage	6-10 leaf stage
common ragweed	2-4 leaf stage	4-6 leaf stage
giant ragweed	not recommended	2-4 leaf stage
jimsonweed	not recommended	2-10 leaf stage

Weeds not dependably controlled by the above rates, but at least partially controlled by special treatments, are yellow nut sedge, large cocklebur (larger than 6-leaf stage) and morning-glory. See special label instructions.

Do not use more than 1½ lbs. bentazon/A in one season. Do not apply within 65 days of harvest. Do not feed treated forage or hay to livestock. Do not apply to soybeans growing under unfavorable conditions such as flooding, hail damage, drought, cold or widely fluctuating temperatures, as crop injury may occur. Weeds under drought stress may not be killed. Rainfall within 8 hours of application may reduce the effectiveness of bentazon.

Dinoseb (Numerous Trade Names) Very Early Overtop: Dinoseb is sometimes called "dinitro" or "DNBP." Apply after weeds emerge, but before soybeans are beyond the

cotyledon stage—before the first leaves open exposing the terminal bud. This requires exact timing. Uneven emergence of the weeds or soybeans may make the treatment impractical. Under favorable conditions, the treatment controls very small pigweed, velvetleaf, annual smartweed, small seedling grasses and other weeds that emerge just before or with the crop. Use 3-5 gals. water/A for aerial application or about 30 gals. water/A for ground application.

Best results are obtained if the application is made when the temperature is between 70° F and 85° F, and if the temperature does not exceed 85° F within 24 hours after application. Use 2¼ lbs. active ingredient/A when the temperature is 75° F to 85° F. Apply when the foliage is dry. Do not apply when soil is wet. Do not apply following chloramben pre-emergence.

Dinoseb (Numerous Trade Names) Directed: When applied as a directed postemergence spray, dinoseb will control some of the annual broadleaved weeds that escape other herbicides. Apply at a rate of 1.5-3 lbs. (2-4 qts. of 3 lbs./gal. formulation)/A from the time soybeans are 5-6 inches tall up to first bloom. A volume of 30-40 gals. water/A may be needed for good coverage. The use of 0.5% by volume (½ gal./100 gals.) of one of the surfactants mentioned on the label will improve the kill of grass seedling and coffeeweed.

Treatment may be repeated once or twice at 7- to 14-day intervals if needed. Do not graze or feed treated forage within three weeks following treatment.

A height differential between the soybeans and weeds is necessary. Use an oiling rig or other precision-directed spray application equipment. Direct the spray to keep it off the soybean plants as much as possible. Spray must not be applied higher than one-half the height of the soybean plants. Soybean leaves wet by the spray will be injured. Weeds, including the growing points, should be covered completely and uniformly with the spray.

2,4-DB (Amine Form) (Numerous Trade Names) Directed: This treatment kills some broadleaved weeds soon enough to reduce yield loss from competition. It has label clearance for use as a directed spray when soybeans are at least 8 inches tall and the weeds are considerably shorter. Apply 0.2 lb./A acid equivalent for cocklebur. The dependability of this rate in controlling morning-glory has not been confirmed under Missouri conditions. Ivy leaf morning-glory appears more susceptible than tall morning-glory to 2,4-DB.

2,4-DB is labeled for directed application to control other weeds 1 inch or less in height or to suppress taller weeds such as velvet leaf, jimsonweed, common ragweed and lambsquarters using 0.35 to 0.4 lb. acid equivalent/A. These higher rates have not been fully evaluated for Missouri.

Use sufficient water for good coverage of the weeds—at least 10 gals./A. Apply with spray nozzles mounted on skids or gauge wheels. Adjust nozzles accordingly. Avoid treating higher than the lower one-third of the soybean plants. Avoid drift to the upper part of the plants. Direct the spray to obtain complete coverage of the weeds, especially the growing points, if the height difference between the soybeans and the weeds will allow. Do not use more than two applications per season. 2,4-DB usually results in some injury to soybeans. Two treatments per season at the higher rates may stunt the soybeans.

Do not spray drought-stressed soybeans. Do not harvest within 60 days after application. Do not use both overtop and directed treatments on the same soybean crop. Do not use on soybeans showing symptoms of Phytophthora root rot disease.

Naptalam + Dinoseb (Numerous Trade Names): Apply 2 to 4 qts. over top after second trifoliate leaf until 20 inch plant height. This treatment will control several broadleaved annual weeds. Do not apply to wet soybean foliage.

Glyphosate (Roundup): This product may be used as a spot treatment for the control of hard to kill weeds. Treatment must be made before initial pod set on soybeans. Apply at growth stage of weed recommended in the *Weeds Controlled* section of each label. Apply this product at a rate shown for spray solution. Complete coverage of foliage is essential.

rate	spray solution
1-2 gals.	100 gals.
1-2 qts.	25 gals.
1.5-3 ozs.	1 gal.

Treatments in the Experimental Stage

An "experimental" designation indicates that the treatment (1) is new and not adequately observed under Missouri conditions to allow an accurate description of its characteristics or (2) although not new, has been found to be marginal in weed control performance or crop safety, and a longer time is required to determine the degree of dependability. *We recommend "Experimental Treatments" be used on a limited basis until their performance has been determined.* Use rates on the label.

Experimental Pre-emergence Treatments

Alachlor (Lasso) + Bifenox (Modown): This tank mix controls several annual grasses and broadleaved species. Check label for proper rates.

Bifenox (Modown): This herbicide is marketed as an 80% wettable powder. It is primarily a broadleaved weed killer.

Under high soil moisture levels, especially when treated soil is splashed onto young crop plants, injury may occur. Soybean injury may appear as a crinkling of the lower leaves and occasionally as stunting.

Chloramben (Amiben) + Linuron (Lorox): This combination has not been fully evaluated for Missouri conditions.

Dinitramine (Cobex) + Metribuzin (Sencor or Lexone): Tank mix preplant incorporated or as a sequential treatment. Check label for rates.

Linuron (Lorox) + Propachlor (Ramrod): This combination is for seed crop only. Do not graze or feed forage from treated areas to livestock. See label for recommended rates.

Oxyfluorfen (Goal): Pre-emergence for control of various broadleaved annuals. Label pending.

Pendimethalin (Prowl) + Chloramben (Amiben): Apply this tank mix in 10 gals. or more water per acre. Livestock can graze or be fed forage from treated soybean fields. See label for rates.

Pendimethalin (Prowl) + Metribuzin (Sencor or Lexone): Application and feeding limitations same as above. See label for rates.

Pendimethalin (Prowl) + Linuron (Lorox): Same instructions as above. See label for rates.

Experimental Postemergence Treatments

Aclifluorfen (Blazer): Postemergence effective in controlling various annual broadleaved weeds—particularly morning-glory and velvetleaf. Label pending.

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