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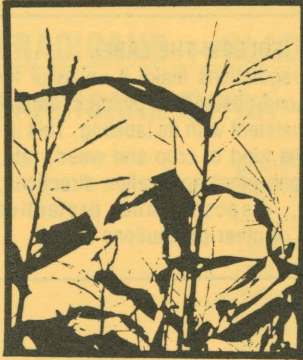
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Weed Control in Corn: 1986

Cooperative Extension Service • South Dakota State University • U.S. Department of Agriculture

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Herbicides are an aid to crop rotation, proper seedbed preparation, and cultivation. Perennials in corn are more difficult to control than annual weeds.

Herbicides are usually required for perennials in continuous cropping systems.

Herbicide Suggestions

Information in this publication is based on South Dakota Agricultural Experiment Station research and other research or observations. Herbicides are included only after the chemical is registered by the Environmental Protection Agency (EPA) as to residue tolerances in crops used for food or feed.

This information is a summary of herbicide uses and does not imply a guarantee or responsibility for results. Tradenames are used for reader convenience and do not imply product endorsement. The label should be considered the final guide. Users are responsible for following all label directions and precautions.

Weed Problems. Weeds are grouped as small-seeded annual broadleaves (kochia, lambs-quarters, pigweed, etc.), large-seeded annual broadleaves (sunflower, cocklebur, etc.), annual grasses (green or yellow foxtail, etc.), or perennial weeds. Control is rated poor, fair, good, very good, or excellent for each category of weeds.

Special Weed Problems. A section for "Special Weed Problems" gives the best treatments for each weed.

Herbicides. Most herbicides are listed by tradename. The common name is also included in the heading. Only the common name is used when the same active ingredient is available in several products.

Rates. Rates for each treatment are stated as the amount of product per acre for most treatments. All rates are on a broadcast basis; adjust accordingly for band application.

Time To Apply. Herbicide may be applied: **EARLY PREPLANT SURFACE.** Applications usually 2 to 6 weeks before planting in no-till situations.

PREPLANT INCORPORATED: before the crop is planted, incorporated as directed.

SHALLOW PREPLANT INCORPORATED: preplant incorporated, but herbicide usually restricted to the top 2 inches of soil with single-pass incorporation.

PREEMERGENCE: after planting but before crop or weeds emerge.

POSTEMERGENCE: after the crop or weeds have emerged.

Reduced Tillage Systems Furrow and Top-plant

Crop residue on the surface may distort the herbicide pattern or intercept some of the herbicide.

Using 10% more herbicide (up to maximum rate for soil) will partially compensate. Heavy corn stalk residue should be worked into the soil before broadcasting soil-applied treatments. Be sure emerged weeds are eliminated with tillage or contact herbicide just ahead of planting. Devices to move residue from the row area will improve results for band application. Special cultivation equipment must be used with reduced tillage systems.

Expect more perennial weed problems. Application of 2,4-D after the silks are brown is helpful in continuous reduced tillage systems for most broadleaved perennials.

Do not use preplant incorporated herbicides with deep furrow or lister planting, as treated soil is moved from the row area. For these systems, limit band width of preemergence herbicide to the width of the furrow bottom. Check herbicide label for restrictions on furrow planted crops. Top-plant systems offer more herbicide alternatives.

Irrigated Corn

Data from SDSU field tests indicate early season weed control is similar for both dryland and irrigated corn. Irrigation at planting can im-

prove the level of weed control and consistency of preemergence treatments.

Late season weeds, however, are more critical under irrigation.

Irrigators should:

1. Apply ½ inch of water with overhead irrigation within 5 days of planting if rainfall has not been adequate for preemergence herbicides. This provides maximum control with these treatments.
2. Broadcast rather than band. This helps control late weed problems in row middles.
3. Use maximum rate for soil type for better and longer control.
4. Use treatments that have maximum residual activity for the rotation for best late season control.
5. Avoid treatments where injury risk is increased from heavy rainfall or irrigation.
6. Use combination soil applied treatments to control small-seeded annual broadleaves and annual grasses. These treatments are usually more effective and have better crop tolerance than postemergence alternatives. Three-way tank-mixes appear very promising for many situations.
7. Limit the use of 2,4-D or Banvel + 2,4-D to areas infested with perennial weeds or for rescue operations. Corn under high fertility, high populations, and optimum soil moisture conditions is less tolerant to these herbicides.
8. Use preplant incorporated treatments for furrow irrigation. The herbicide treated soil layer is usually disturbed when the irrigation furrows are formed; however preplant incorporated treatments may give slightly better control than preemergence treatments in this situation.

Band vs. Broadcast

Banding reduces the cost per acre and usually replaces one or two row cultivations. One cultivation is usually needed with broadcast application.

Adjust broadcast rates for banding. A 12- to 14-inch band is suggested for top planting; a 7-inch band is suggested for most deep furrow or lister-planted crops.

Labeled rates for the range in soil types are listed in this publication. Suggested rates based on SDSU tests are also stated. These rates have provided acceptable weed control with at least one cultivation. Higher rates increase cost per acre but may be justified where heavy weed pressure is expected or where maximum control is desired.

There is no intent to specify product performance guarantees; such agreements involve the labeler and user. Consult specific labels and their accompanying material.

Abbreviations Used

pt	=	pint
qt	=	quart
lb	=	pound
gpa	=	gallons per acre
lb/gal	=	pound per gallon
act	=	actual, active ingredient, or acid equivalent
W	=	wettable powder
L	=	liquid, flowable
DF, WDG	=	dry flowable, water dis- persible granule (spray)
G	=	granule
E	=	emulsifiable concentrate

FOLLOW THE LABEL

Federal regulations make it unlawful for any person to use an herbicide in a manner inconsistent with its labeling. This includes the kind of crop and weed; rate, carrier, and other application directions; storage, disposal, and protective clothing; or other precautions stated.

CORN HERBICIDES

ERADICANE (EPTC + SAFENER) OR ERADICANE EXTRA (EPTC + SAFENER + EXTENDER)

3³/₄-4³/₄ pt Eradicane 6.7E or 4-5¹/₃ pt Eradicane Extra 6E (3-4 lb act)

Excellent control of most annual grasses and fair control of a few small-seeded annual broadleaves. Very good sandbur and wild oat control. Does not control large-seeded annual broadleaves. Quackgrass control has not been consistent. The most consistent preplant incorporated treatment for annual grasses. Some weeds may emerge in extremely cool soil conditions. Safening agent provides adequate crop tolerance. Use lower rate on light, low organic matter soil. The high rate has been most consistent in SDSU tests. Higher rate of 7¹/₃ pt/A Eradicane or 8 pt/A Eradicane Extra are suggested for yellow nutsedge, wild cane, wild proso millet control or suppression of quackgrass. Eradicane contains 6.7 lb/gal EPTC plus a safening agent. Eradicane Extra contains 6 lb/gal EPTC plus a safening agent plus an extender to prolong the soil residual activity. Eradicane Extra is intended for use in soils which have the capacity for rapid Eradicane degradation with repeated use, primarily where wild proso and wild cane are serious problems. May be applied in liquid fertilizer or impregnated on dry fertilizer. Follow normal incorporation guidelines. May also be injected with anhydrous ammonia using applicators with injection shanks 8 to 10 inches apart and set for injection at 4 to 5 inches deep. Cross tillage improves uniformity, especially if soil is heavy, wet, and cool. Minimum carrier is 10 gpa. No carryover. Not for corn seed fields.

PREPLANT INCORPORATED. Apply within 2 weeks of planting. Incorporate immediately to a depth of 2 to 3 inches. Use a tandem disk set to cut 4 to 6 inches deep, a field cultivator with sweeps operated at 5 to 6 mph, or other implements that thoroughly mix the herbicide into the soil. A second incorporation improves uniformity, especially under trashy or wet soil conditions. A tandem disk with small blades followed by a field cultivator with a harrow or leveling device usually provides good incorporation under most conditions. Treated soil is removed from row area with lister- or furrow-planted corn. Improper incorporation reduces control.

ERADICANE + ATRAZINE (EPTC + SAFENER + ATRAZINE)

ERADICANE EXTRA + ATRAZINE (EPTC + SAFENER + EXTENDER + ATRAZINE)

*3³/₄-4³/₄ pt Eradicane 6.7E or 4-5¹/₃ pt Eradicane Extra 6E +
1-1¹/₂ qt atrazine 4L or 1¹/₄-2 lb atrazine 80W or 1.1-1.7 lb atrazine 90 WDG
(3-4 + 1-1¹/₂ lb act)*

Tank-mix. Excellent control of most annual grasses and very good control of several small-seeded annual broadleaves. Fair to good control of certain large-seeded annual broadleaves. Adequate crop tolerance. Use the lower rates on light, low organic matter soil. Rates of 4 pt Eradicane or 4¹/₂ pt Eradicane Extra + atrazine at 1 qt of 4L or 1¹/₄ lb of 80W or 1.1 lb of 90 WDG formulation per acre have been satisfactory in most SDSU tests. Rate of 7¹/₃ pt Eradicane or 8 pt of Eradicane Extra per acre is suggested for wild proso millet, wild cane, yellow nutsedge control, or quackgrass suppression. Higher atrazine rates improve control of some broadleaves, but also increase carryover. Eradicane Extra contains an extender to prolong soil residual with continued use where weeds such as wild proso millet or wild cane are problems. May be applied in liquid fertilizer or impregnated on certain dry fertilizers. Minimum carrier is 10 gpa. Refer to carryover limitations in atrazine section. Not for corn seed fields.

PREPLANT INCORPORATED. Incorporate as for Eradicane alone.

ERADICANE + BLADEX (EPTC + SAFENER + CYANAZINE)

ERADICANE EXTRA + BLADEX (EPTC + SAFENER + EXTENDER + CYANAZINE)

3³/₄-4³/₄ pt Eradicane 6.7E or 4-5¹/₃ pt Eradicane Extra 6E + ³/₄-3 qt Bladex 4L or 1-3³/₄ lb Bladex 80W or .8-3¹/₃ lb Bladex 90DF (3-4 + ³/₄-3 lb act)

Tank-mix. Excellent control of most annual grasses and very good control of several small-seeded annual broadleaves. Fair control of certain large-seeded annual broadleaves. Consistent results. Some weeds may emerge in extremely cool soil conditions. Adequate crop tolerance. Use the lower rates for light, low organic matter soil. Rates of 4 pt Eradicane or 4¹/₂ pt Eradicane Extra + Bladex at 2 qt of 4L or 2¹/₂ lb of 80W or 2¹/₄ lb of 90DF formulation per acre have been satisfactory in most SDSU tests. Increase Bladex rates 25% for reduced till situations where residue from previous crop is heavy. Rate of 7¹/₄ pt Eradicane or 8 pt Eradicane Extra is suggested for wild proso millet, wild cane, yellow nutsedge control, or quackgrass suppression. Not for sandy soil with less than 2% organic matter. Eradicane Extra contains an extender to prolong soil residual with continued use where weeds such as wild proso millet or wild cane are problems. May be applied in liquid fertilizer or impregnated on certain dry fertilizers. Minimum carrier is 10 gpa. No carryover. Not for corn seed fields.

PREPLANT INCORPORATED. Incorporate as for Eradicane alone.

ERADICANE + BLADEX + ATRAZINE (EPTC + SAFENER + CYANAZINE + ATRAZINE)

ERADICANE EXTRA + BLADEX + ATRAZINE (EPTC + SAFENER + EXTENDER + CYANAZINE + ATRAZINE)

3³/₄-4³/₄ pt Eradicane 6.7E or 4-5¹/₃ pt Eradicane Extra 6E + ¹/₂-2 qt Bladex 4L or ³/₄-2¹/₂ lb Bladex 80W or .6-2¹/₄ lb Bladex 90DF + ¹/₂-2 pt atrazine 4L or ¹/₂-1¹/₄ lb atrazine 80W or ¹/₃-1.1 lb atrazine 90WDG (3-4 + ¹/₂-2 + ¹/₄-1 lb act)

Three-way tank-mix. Excellent control of most annual grasses and several small-seeded annual broadleaves. Provides better late season annual broadleaf control than Bladex mixture and better control of certain large-seeded annual broadleaves with less carryover risk than lower rate atrazine combinations. Rates of 4 pt Eradicane or 4¹/₂ pt Eradicane Extra + Bladex at 1¹/₂ qt of 4L or 2 lb of 80W or 1²/₃ lb of 90DF + atrazine at 1 pt of 4L or ²/₃ lb of 80W or ²/₃ lb of 90 WDG formulation per acre are suggested for most situations. Higher Eradicane rates will improve grass control in heavy soil, and high atrazine rate is suggested for better broadleaf control, especially where velvetleaf is part of the problem. Rate of 7¹/₄ pt Eradicane or 8 pt Eradicane Extra is suggested for wild proso millet, wild cane, or yellow nutsedge control. Lower atrazine rates reduce carryover risk, allowing crops other than oats or sunflowers, which are most sensitive, to be planted with reduced risk most years. Refer to atrazine section for carryover information. Eradicane Extra contains an extender to prolong soil residual with continued use where weeds such as wild proso millet or wild cane are problems. May be applied in liquid fertilizer. Minimum carrier is 10 gpa. Do not use on corn seed fields.

PREPLANT INCORPORATED. Incorporate as for Eradicane alone.

SUTAN⁺ or GENATE PLUS (BUTYLATE + SAFENER)

4³/₄ pt Sutan⁺ or Genate Plus 6.7E (4 lb act)

Very good to excellent control of several annual grasses. Not effective on broadleaves. Consistent performance except for possible reduced control in extremely cool soil conditions. Safening agent provides adequate crop tolerance. Lower rates give less consistent results. Rate of 7¹/₃ pt/A is suggested for wild cane or yellow nutsedge control. Plant corn no more than 2 inches deep. May be applied in liquid fertilizer or impregnated on dry fertilizer. Follow normal incorporation guidelines. May also be injected with anhydrous ammonia using applicators with injection shanks 8 to 10 inches apart and set for injection at 4 to 5 inches deep. Cross tillage improves uniformity, especially if soil is heavy, wet, and cool. Minimum carrier is 10 gpa. No carryover. Do not use on corn seed fields.

PREPLANT INCORPORATED. Applied within 2 weeks of planting. Incorporate immediately to a depth of 2 to 3 inches. Use a tandem disk set to cut 4 to 6 inches deep, a field cultivator with sweeps operated at 5 to 6 mph, or other implement that thoroughly mixes the herbicides into the soil. A second incorporation improves uniformity, especially under trashy or wet soil conditions. A tandem disk with small blades followed by a field cultivator with a harrow or leveling device usually provides good incorporation under most conditions.

One-hour incorporation delay not recommended; except if surface soil is dry, wind velocity is low, and immediate incorporation was prevented by unexpected problems. Treated soil is removed from row area with lister- or furrow-planted corn. Improper incorporation reduces control.

SUTAN⁺ or GENATE PLUS + ATRAZINE (BUTYLATE + SAFENER + ATRAZINE)

SUTAZINE⁺ or ATRABUTE⁺

*3³/₄-4³/₄ pt Sutan⁺ or Genate Plus 6.7E + 1-1¹/₂ qt atrazine 4L or 1¹/₄-2 lb atrazine 80W
or 1.1-1.7 lb atrazine 90WDG
5¹/₄-7 pt Sutazine⁺ or Atrabute⁺*

(3-4 + 1-1¹/₂ lb act)

Tank-mix or use commercial premix (Sutazine⁺ or Atrabute⁺) containing 4.8 lb butylate + 1.2 lb atrazine active per gallon. Very good to excellent control of many annual grasses and several small-seeded annual broadleaves. Fair control of certain large-seeded annual broadleaves. Better late season broadleaf control than Bladex combination. Good crop tolerance. Consistent performance except for possible reduced control under extremely cool soil conditions. Use lower rates on light, low organic matter soil and higher rates on heavy clay soil or for certain special weed problems. Rates of 4³/₄ pt Sutan⁺ or Genate Plus + atrazine at 1 qt of 4L or 1¹/₄ lb of 80W or 1.1 lb of 90 WDG formulation per acre or 7 pt/A Sutazine⁺ or Atrabute⁺ have been satisfactory in most SDSU tests. Atrabute⁺ II is a commercial premix containing 4.3 lb butylate + 1.7 lb atrazine active per gallon and may be used where higher rates of atrazine are required. May be applied in liquid fertilizer or impregnated on certain dry fertilizers. Minimum carrier is 10 gpa. Refer to carryover crop limitations in atrazine section. Do not use on corn seed fields.

PREPLANT INCORPORATED. Incorporate as for Sutan⁺ or Genate Plus alone.

SUTAN⁺ or GENATE PLUS + BLADEX (BUTYLATE + SAFENER + CYANAZINE)

*3³/₄-4³/₄ pt Sutan⁺ or Genate Plus 6.7E + ³/₄-3 qt Bladex 4L or 1-3³/₄ lb Bladex 80W or .8-3¹/₃ lb Bladex 90DF
(3-4 + ³/₄-3 lb act)*

Tank-mix. Very good to excellent control of many annual grasses and several small-seeded annual broadleaves. Fair control of certain large-seeded annual broadleaves. Consistent performance except for possible reduced control under extremely cool soil conditions. Good crop tolerance. Use lower rates on light, sandy soil and higher rates on heavy, clay soil. Not for sandy soils with less than 1% organic matter. Rates of 4¹/₄ pt Sutan⁺ or Genate Plus + Bladex at 2 qt of 4L or 2¹/₂ lb of 80W or 2¹/₄ lb of 90DF formulation per acre have been satisfactory in most SDSU tests. Increase Bladex rates 25% for reduced till situations where residue from previous crop is heavy. Use maximum rates for certain special weed problems. May be applied in liquid fertilizer or impregnated on certain dry fertilizers. Minimum carrier is 10 gpa. No carryover. Do not use on corn seed fields.

PREPLANT INCORPORATED. Incorporate as for Sutan⁺ or Genate Plus alone.

SUTAN⁺ + BLADEX + ATRAZINE (BUTYLATE + SAFENER + CYANAZINE + ATRAZINE)

*3³/₄-4³/₄ pt Sutan⁺ 6.7E + ¹/₂-2 qt Bladex 4L or ³/₄-2¹/₂ lb Bladex 80W or .6-2¹/₄ lb Bladex 90DF + ¹/₂-2 pt atrazine 4L or
¹/₂-1¹/₄ lb atrazine 80W or ¹/₃-1.1 lb atrazine 90WDG (3-4 + ¹/₂-2 + ¹/₄-1 lb act)*

Three-way tank-mix. Provides better late season annual broadleaf control than Bladex mixture and better control of certain large-seeded annual broadleaves with less carryover risk than atrazine combinations. Has performed very well in SDSU tests. Rates of 4¹/₄ pt Sutan⁺ + Bladex at 1¹/₂ qt of 4L or 2 lb of 80W or 1²/₃ lb of 90DF + atrazine at 1 pt of 4L or ²/₃ lb of 80W or ²/₃ lb of 90WDG formulation per acre are suggested for most situations where carryover must be minimized to allow for additional rotational crops. High atrazine rate is suggested for better broadleaf control, especially where velvetleaf is part of the problem. Crops other than highly sensitive crops such as oats or sunflowers can be planted with minimal risk most years. Refer to atrazine section for carryover information. May be applied in liquid fertilizer or impregnated on certain dry fertilizers. Minimum carrier is 10 gpa. Do not use on corn seed fields.

PREPLANT INCORPORATED. Incorporate as for Sutan⁺ alone. Refer to Sutan⁺ + Bladex or atrazine sections.

ATRAZINE (ATRAZINE)

2-3 qt atrazine 4L or 2¹/₂-3³/₄ lb atrazine 80W or 2.2-3.3 lb atrazine 90 WDG (2-3 lb act)

Excellent control of several small-seeded annual broadleaves. High rates provide good to excellent control of several large-seeded broadleaves. Annual grass control erratic. Very consistent on broadleaves. Good late season control. Excellent crop tolerance. Use lower rate on light, low organic matter soil. Atrazine at 2¹/₂ qt of 4L or 3 lb of 80W or 2³/₄ lb of 90WDG formulation per acre has been satisfactory in most SDSU tests. Preplant and preemergence applications may be made in liquid nitrogen fertilizer.

Carryover may damage soybeans, sunflowers, small grain, and legume/grass seedlings the following year. Corn and sorghum are tolerant. Risk of carryover is greatest on high pH, low organic matter soils or eroded knolls. Risk is increased in dry seasons and with reduced tillage systems. Carryover is minimized with low rates used in combination with other soil ap-

plied herbicides. Soybeans and flax usually tolerate carryover from rates up to 1 lb/A active in conventional tillage. Preplant or preemergence applications may be made by air using 1 qt carrier for each 1 qt of atrazine 4L or 1 gpa carrier for each pound of other formulations. Minimum carrier is 10 gpa for ground or 2 gpa for air.

EARLY PREPLANT SURFACE. Refer to Atrazine in No-Till section.

SHALLOW PREPLANT INCORPORATED. Incorporate into the top 2 inches of soil within 2 weeks of planting with a field cultivator or shallow disk during final seedbed preparation. Most consistent application method. Provides best large-seeded broadleaf control. Not affected by heavy rainfall.

PREEMERGENCE. Requires $\frac{3}{4}$ to 1 inch rain within one week after application. Less consistent. Use a harrow or rotary hoe if weeds emerge before rainfall.

EARLY POSTEMERGENCE. Without oil. Postemergence application with crop oil strongly preferred. Apply before weeds are over $\frac{1}{2}$ inches tall.

1 1/4-2 qt atrazine 4L or 1 1/2-2 1/2 lb atrazine 80W or 1.3-2.2 lb atrazine 90WDG (1 1/2-2 lb act)

EARLY POSTEMERGENCE. With crop oil. Intended for annual broadleaves only. Very good control of several emerged broadleaves. Weeds should be less than $\frac{1}{2}$ inches high. Rainfall, high humidity, and dew improve results. Intended to be followed with cultivation. Grass control is fair to poor. Small grasses may be controlled if rainfall and humidity are favorable. Larger grasses frequently are not affected. Some leaf burn on perennials but little stand reduction. Good crop tolerance in most conditions. Some crop yellowing or leaf tip burn may occur under extremely cold, wet conditions. Regular crop oil or oil concentrate is more effective than wetting agents. Use regular crop oil at the rate of 1 gpa for ground and $\frac{1}{2}$ gpa for aerial application. Use oil concentrate at the rate of 1 qt/A for ground or 1-2 pt/A for air. Do not add 2,4-D or Banvel. Do not use liquid fertilizer carrier. Refer to atrazine section for carryover crop limitations.

BLADEX (CYANAZINE)

1 1/4-4 3/4 qt Bladex 4L or 1 1/2-6 lb Bladex 80W or 1 1/3-5 1/4 lb Bladex 90DF (1 1/4-4 3/4 lb act)

Good to very good control of several small-seeded annual broadleaves and good control of several annual grasses. Higher rates give very good control of certain large-seeded annual broadleaves. Better grass control than atrazine. Has been less consistent than some other treatments. Used primarily in combination with other herbicides. Good crop tolerance in most situations. Risk of yellowing increases under extremely wet, cold conditions, especially with highest rates. Rates of Bladex at 3 qt of 4L or $3\frac{3}{4}$ lb of 80W or $3\frac{1}{3}$ lb of 90 DF formulation per acre have been used in most SDSU preplant or preemergence tests. Use higher rate on heavy clay and lower rate on light, coarse soil. Do not use on sands. Preplant and preemergence applications may be made in liquid fertilizer. Minimum carrier is 15 to 20 gpa for ground and 4 gpa for air. No carryover.

EARLY PREPLANT SURFACE. Refer to Bladex in No-Till section.

SHALLOW PREPLANT INCORPORATED. May be incorporated into top 1 to 2 inches of soil. Gives better performance with very limited rainfall but less control than preemergence application with adequate rainfall. Reduced control in wet seasons.

PREEMERGENCE. Must have $\frac{3}{4}$ to 1 inch of rain within one week of application. Use a harrow or rotary hoe to remove weeds that emerge before rainfall.

1 1/2-2 1/2 lb Bladex 80W or 1.3-2.2 lb Bladex 90DF

EARLY POSTEMERGENCE. Apply before weeds are over $\frac{1}{2}$ inch tall and before corn has more than 4 leaves. Results variable; however, grass and annual broadleaf control can be very good to excellent under good conditions. Fits situations where carryover is a problem. Rainfall, dew, or high humidity improve results. In dry conditions, add a non-petroleum based surfactant. Bladex 80W or 90DF only. The high rate is suggested for most situations on soil with over 2% organic matter. Some risk of crop injury. Yellowing and leaf burn may be noted under wet conditions and low temperature. Do not apply in cold, wet weather or if crop is weather stressed. Extended cold or adverse weather conditions may reduce stand. Not for use on seed production fields. Minimum carrier is 15 gpa for ground or 4 gpa for air.

BLADEX + ATRAZINE (CYANAZINE + ATRAZINE)

3/4-3 3/4 qt Bladex 4L or 1-4 2/3 lb Bladex 80W or .8-4.1 lb Bladex 90DF + 1/2-1 1/2 qt atrazine 4L or 2/3-1 3/4 lb atrazine 80W or .6-1 2/3 lb atrazine 90WDG (3/4-3 3/4 + 1/2-1 1/2 lb act)

Tank-mix. Good to excellent control of most annual broadleaves. Fair to good on annual grass. Primarily for situations where annual broadleaves are the major problem. Adjust the ratio of Bladex to atrazine to fit the weed problem. Use a 1:1 ratio where broadleaves are serious; use a lower atrazine ratio (3:1) where grasses are more serious; however the combined rate should not exceed the rate for Bladex alone. Increase Bladex rates 25% for reduced till situations where residue from previous crop is heavy. Follow crop rotation restrictions as for atrazine alone. Minimum carrier is 15 gpa for ground or 4 gpa for air.

EARLY PREPLANT. Refer to Bladex in No-Till section.

PREEMERGENCE. Apply at planting. Rainfall required. Use harrow, rotary hoe or other shallow cultivation if weeds emerge before rainfall received.

1-1-3/4 lb Bladex 80W or 1-1 1/2 lb Bladex 90DF + 1/2-3/4 lb atrazine 80W or .4-.6 lb atrazine 90WDG (1-1 1/2 + .4-.6 lb act)

EARLY POSTEMERGENCE. As for Bladex postemergence used alone. Use only Bladex 80W or 90DF and atrazine 80W. For dry, low humidity conditions, add a non-petroleum based surfactant.

Intended to reduce risk of atrazine carryover when compared to atrazine alone. Lower Bladex rate reduces risk of corn leaf burn associated with Bladex used alone. Field reports indicate satisfactory performance. Atrazine rate is too low to maintain high level of wild oat control.

Must be applied before corn is beyond the 4-leaf stage and before weeds are over 1 to 1 1/2 inches tall. Suggested Bladex rates are 1.1 to 1 3/4 lb of 80W or 1-1 1/2 lb of 90DF per acre + atrazine at 1/2 to 3/4 lb of 80W or .4 to .6 lb of 90 DF formulation per acre. The minimum Bladex rate for most situations is 1.5 lb/A product. Minimum carrier is 15 gpa for ground or 4 gpa for air. Do not apply in liquid fertilizer carrier. Not for use on seed production fields.

LASSO (ALACHLOR)

2-3 1/2 qt Lasso 4E or 16-26 lb Lasso II 15G (2-3 1/2 lb act)

Very good to excellent control of several annual grasses. Fair control of pigweed and lambsquarters with high rates and favorable conditions. Consistent on annual grasses when rainfall or soil moisture requirements are met. Very good crop tolerance. Rates vary according to soil type and application method. Rates of 2 1/2 to 3 qt Lasso or 16 to 20 lb gran (broadcast) per acre have been satisfactory in most preemergence SDSU tests. Rates of 3 to 4 qt/A are suggested for severe weed infestations or for yellow nutsedge, or when planting into heavy residue from the previous crop in minimum till systems. May be applied in liquid fertilizer or impregnated on certain dry fertilizers. Minimum carrier is 10 gpa for ground. Granule and spray formulations appear to be equally effective. Granules are applied to the soil surface behind the press wheel. Follow handling directions. Use protective clothing including face shield, rubber gloves, and boots when mixing. Do not exceed the recommended rate for granules. No carryover.

SHALLOW PREPLANT INCORPORATED. Incorporate Lasso spray into the top 2 inches of soil within 7 days before planting with field cultivator, shallow disk, multiweeder, or other suitable implements during final seedbed preparation. Flextime harrow is not satisfactory. Better results than preemergence when rainfall is very limited, but slightly less control than preemergence application with adequate rainfall. May be more consistent in low rainfall areas. Some rainfall improves control; heavy rain reduces results. Proper incorporation may be difficult with trashy, lumpy seedbed. Use 1 pt/A more Lasso than for preemergence. Rate of 3 1/2 qt/A Lasso has been used in most tests.

PREEMERGENCE. Requires 1/2 to 3/4 inch rainfall within one week after application. Use a harrow or rotary hoe if weeds emerge before rainfall is received. Travel the same direction as the rows if banded.

EARLY POSTEMERGENCE. May be applied after crop emergence before corn exceeds 5 inches. Emerged weeds are not controlled. Not a planned weed program. Do not use liquid fertilizer carrier.

LASSO + ATRAZINE (ALACHLOR + ATRAZINE)

LASSO/ATRAZINE

2-3 qt Lasso 4E + 1-1 1/2 qt atrazine 4L or 1 1/4-2 lb atrazine 80W or 1.1-1.7 lb atrazine 90 WDG (2-3 + 1-1 1/2 lb act)
3-4 qt Lasso/Atrazine

Tank-mix or use commercial premix (Lasso/Atrazine) containing 2 1/2 lb alachlor + 1 1/2 lb atrazine active per gallon. Very good to excellent control of several annual grasses and small-seeded annual broadleaves. Fair control of certain large-seeded broadleaves. Consistent performance. Better late season control than with Bladex combinations. Excellent crop tolerance. Rates vary according to soil type and application method. Use low rates on light, low organic matter soil. High rates are for heavy, clay soil and to improve control of certain weeds. Higher atrazine rates will improve broadleaf control and are required for large-seeded broadleaves. Rates of 2 to 2 1/2 qt Lasso + atrazine at 1 qt of 4L or 1 1/4 lb of 80W or 1.1 lb of 90 WDG formulation per acre have been satisfactory for most preemergence SDSU tests. Rates of 3 qt Lasso + atrazine at 2 qt of 4L or 2 1/2 lb of 80W or 2 1/4 lb of 90 WDG formulation per acre can be used for minimum till systems when planting into heavy residue from the previous crop. Tank-mix preferred as it allows flexibility of rates so carryover can be minimized. The premix is best suited to continuous corn rotation because of the high ratio of atrazine to alachlor. Preplant and preemergence applications may be in liquid fertilizer or impregnated on certain dry fertilizers. Minimum carrier is 10 gpa for ground and 3 gpa for air. Refer to carryover crop limitations in atrazine section.

SHALLOW PREPLANT INCORPORATED. Incorporate as for Lasso alone. Use 1 pt/A more Lasso than for preemergence.

PREEMERGENCE. Refer to Lasso section.

EARLY POSTEMERGENCE. May be applied before the 2-leaf stage of grassy weeds and before corn is 5 inches tall. Less consistent. Primarily as an alternative if unforeseen conditions prevented earlier application. Harrowing or rotary hoeing to remove emerged weeds will improve results.

LASSO + BLADEX (ALACHLOR + CYANAZINE)

2-3 qt Lasso 4E + 3/4-3 qt Bladex 4L or 1-3 3/4 lb Bladex 80W or .8-3 1/3 lb Bladex 90DF (2-3 + 3/4-3 lb act)

Tank-mix. Very good to excellent control of many annual grasses and several small-seeded annual broadleaves. Fair control of certain large-seeded annual broadleaves. Consistent performance when rainfall received. Some late season weeds may emerge. Good crop tolerance. Use low rates on light, low organic matter soil. Rates of 2 to 2 1/2 qt Lasso + Bladex at 2 qt of 4L or 2 1/2 lb of 80W or 2 1/4 lb 90DF formulation per acre have been satisfactory for most preemergence SDSU tests. Increase Bladex rates 25% for reduced till situations where residue from previous crop is heavy. Use the higher rates for minimum till systems when planting into heavy residue from the previous crop. Preplant incorporated and preemergence applications may be applied with liquid fertilizer carrier. Preplant incorporated applications may be impregnated on certain dry fertilizer. Minimum carrier is 15 gpa for ground. No carryover.

EARLY PREPLANT SURFACE. Refer to Bladex in No-Till section.

SHALLOW PREPLANT INCORPORATED. Incorporate as for Lasso alone. Add 1 pt Lasso or Bladex at 1/2 pt of 4L or 1/3 lb of 80W formulation per acre additional over the preemergence rate. Deep incorporation reduces control.

PREEMERGENCE. Refer to sections for Lasso or Bladex. Rainfall critical. Do not apply after crop emergence.

LASSO + BLADEX + ATRAZINE (ALACHLOR + CYANAZINE + ATRAZINE)

DUAL + BLADEX + ATRAZINE (METOLACHLOR + CYANAZINE + ATRAZINE)

2-3 qt Lasso 4E + 1-4 pt Bladex 4L or 3/4-2 1/2 lb Bladex 80W or .6-2 1/4 lb Bladex 90DF + 1/2-2 pt atrazine 4L or 1/2-1 1/2 lb atrazine 80W or 1/3-1.1 lb atrazine 90WDG (2-3 + 1/2-2 + 1/4-1 lb act)

1 1/2-2 1/2 pt Dual 8E + 1-4 pt Bladex 4L or 3/4-2 1/2 lb Bladex 80W or .6-2 1/4 lb Bladex 90DF + 1/2-2 pt atrazine 4L or 1/2-1 1/2 lb atrazine 80W or 1/3-1.1 lb atrazine 90WDG (1 1/2-2 1/2 + 1/2-2 + 1/4-1 lb act)

Three-way tank-mix. Excellent control of most annual grasses and several small-seeded annual broadleaves. Provides better late season annual broadleaf control than the Bladex mixture and better control of certain large-seeded annual broadleaves with less carryover risk than lower rate atrazine combinations. Weak on velvetleaf. Very consistent performance. Rates of 2 to 2 1/2 qt Lasso or 2 to 2 1/2 pt Dual + Bladex at 1 1/2 qt of 4L or 2 lb of 80W or 1 2/3 lb of 90DF + atrazine at 1 pt of 4L or .6 lb of 80W or .6 lb of 90 WDG formulation per acre are suggested for most situations where atrazine carryover must be minimized. Labeled rates for atrazine are higher and will improve broadleaf control. Carryover risk with the low rate is reduced for most crops except highly sensitive crops such as oats or sunflowers. Refer to atrazine section for carryover information. Minimum carrier is 10 gpa for ground application. May be applied in liquid fertilizer.

SHALLOW PREPLANT INCORPORATED. Incorporate as for Lasso or Dual alone. Use 1 pt/A more Lasso than for preemergence.

PREEMERGENCE. Refer to Lasso or Dual section.

LASSO + SENCOR or LEXONE + BLADEX or ATRAZINE (ALACHLOR + METRIBUZIN + CYANAZINE or ATRAZINE)

DUAL + SENCOR or LEXONE + BLADEX or ATRAZINE (METOLACHLOR + METRIBUZIN + CYANAZINE or ATRAZINE)

1 1/2-2 1/2 qt Lasso 4E + 1/2 pt Sencor or Lexone 4L or 1/3 lb Sencor or Lexone 75DF + 1 1/4-3 qt Bladex 4L or 1 1/2-3 pt atrazine 4L (1 1/2-2 1/2 + 1/4 + 1 1/4-3 or 3/4-1 1/2 lb act)

1 1/2-2 1/2 pt Dual 8E + 1/2 pt Sencor or Lexone 4L or 1/3 lb Sencor or Lexone 75DF + 1 1/4-3 qt Bladex 4L or 1 1/2-3 pt atrazine 4L (1 1/2-2 1/2 + 1/4 + 1 1/4-3 or 3/4-1 1/2 lb act)

Three-way tank-mix. Excellent control of most annual grasses and several annual broadleaves. Very consistent control. Intended for improved broadleaved control with minimal atrazine carryover. For very limited, special situations. Will improve velvetleaf control compared to the same rates of atrazine or Bladex in mixture. Marginal crop tolerance. Do not use on soil with pH over 7.0. Not for coarse, sandy soil with less than 2% organic matter. Rates of Lasso at 2 qt or Dual at 2 pt + Sencor or Lexone at 1/2 pt + Bladex at 1 1/2 qt or atrazine at 1 to 2 pt per acre are suggested for most situations. Use equivalent amounts of other formulations. Slightly greater crop tolerance and higher velvetleaf control with atrazine than with Bladex in the combination. Minimum carrier is 20 gpa for ground.

PREEMERGENCE. Apply before crop emerges. Do not incorporate.

DUAL (METOLACHLOR)

1½-3 pt Dual 8E or 6-12 lb Dual 25G (1½-3 lb act)

Very good to excellent control of several annual grasses. Fair control of pigweed with high rates and favorable conditions. Consistent on annual grasses when rainfall or soil moisture requirements are met. Low rates for light, low organic matter soil. Rates of 2½ to 3 pt Dual or 10 to 12 lb Dual 25G per acre (broadcast) have been satisfactory in most SDSU tests. Very good crop tolerance. May be applied in liquid fertilizer. Preplant incorporated application may be impregnated onto certain dry fertilizers. Minimum carrier is 10 gpa for ground and 2 gpa for air. Granules usually applied to the soil surface behind the press wheel. Calibrate and apply accurately to avoid excessive rates. No carryover.

EARLY PREPLANT SURFACE. Refer to Dual in No-Till section.

SHALLOW PREPLANT INCORPORATED. Incorporate into top 2 inches of soil with field cultivator, shallow disk, multiweeder, or other suitable implements during final seedbed preparation within 14 days. Better results than preemergence when rainfall is very limited, but gives slightly less control than preemergence application with adequate rainfall. May be more consistent in low rainfall areas. Some rainfall improves control; heavy rain reduces effectiveness. Proper incorporation may be difficult with trashy, lumpy seedbed. Deeper incorporation reduces control. Use maximum rate for soil type.

PREEMERGENCE. Requires ½ to ¾ inch rain within one week after application. Harrow or rotary hoe if weeds emerge before rainfall. Travel same direction as the rows if banded.

DUAL + ATRAZINE (METOLACHLOR + ATRAZINE)

BICEP

*1½-2½ pt Dual 8E + 1-2 qt atrazine 4L or 1¼-2½ lb atrazine 80W
or 1.1-2.2 lb atrazine 90 WDG*

(1½-2½ + 1-2 lb act)

2-4 qt Bicep

Tank-mix or use commercial premix (Bicep) containing 2½ lb/gal metolachlor + 2 lb/gal atrazine active. Very good to excellent control of several annual grasses and small-seeded annual broadleaves. Fair control of certain large seeded broadleaves. Consistent performance when rainfall or soil moisture requirements are met. Better late season control than Bladex combinations.

Use lower rates on light, low organic matter soil. Rates of 2 to 2½ pt Dual + atrazine at 1 qt of 4L or 1¼ lb of 80W or 1.1 lb of 90 WDG formulation per acre have been satisfactory in most SDSU tests. Higher atrazine rates improve control of certain large-seeded broadleaves but also increase carryover. Use the higher rates for the soil type in minimum till systems when planting into heavy residues from the previous crop. Tank-mix preferred. Allows flexibility of ratio of atrazine to metolachlor. Preplant and preemergence application may be made in liquid fertilizer. May be applied preplant incorporated. May be impregnated onto dry fertilizers. Minimum carrier is 10 gpa for ground and 2 gpa for air. Refer to carryover crop limitations in atrazine section.

EARLY PREPLANT SURFACE. Refer to Dual + Atrazine in No-Till section.

SHALLOW PREPLANT INCORPORATED. Incorporate as for Dual alone.

PREEMERGENCE. Refer to Dual section.

EARLY POSTEMERGENCE. May be applied before the 2-leaf stage of weeds, but before corn is 5 inches tall. Less consistent. Primarily as an alternative if unforeseen conditions prevented earlier application. Harrowing or rotary hoeing to remove emerged weeds will improve results.

DUAL + BLADEX (METOLACHLOR + CYANAZINE)

1½-2½ pt Dual 8E + ¾-3 qt Bladex 4L or 1-3¾ lb Bladex 80W or .8-3⅓ lb Bladex 90DF (1½-2½ + ¾-3 lb act)

Tank-mix. Very good to excellent control of many annual grasses and several small-seeded annual broadleaves. Some late season weeds may emerge. Good crop tolerance. Lower rates are for light, low organic matter soil. Rates of 2 pt Dual + Bladex at 1½ qt of 4L or 2 lb of 80W formulation per acre have been satisfactory in most SDSU tests. Increase Bladex rates 25% for reduced till situations where residue from previous crop is heavy. Use the higher rates for the soil type in minimum till systems when planting into heavy residues from the previous crop. Higher rates of Bladex will improve control of certain large-seeded annual broadleaves on heavy soil. May be applied in liquid fertilizer. Preplant incorporated application may be impregnated onto certain dry fertilizers. Minimum carrier is 20 gpa for ground and 2 gpa for air. No carryover.

EARLY PREPLANT SURFACE. Refer to Bladex in No-Till section.

SHALLOW PREPLANT INCORPORATED. Incorporate as for Dual alone.

PREEMERGENCE. Refer to Dual section. Rainfall critical. Do not apply postemergence.

RAMROD (PROPACHLOR)

4-6 qt Ramrod 4L or 20-30 lb Ramrod 20G (broadcast) (4-6 lb act)

Very good to excellent control of several annual grasses. Does not control broadleaves. Most consistent preemergence treatment for annual grasses in limited rainfall situations. Has 2 to 3 weeks shorter residual than Lasso or Dual, but requires less rainfall for activation. Late weeds may emerge in wet seasons. Excellent crop tolerance.

Granules or flowable easier to handle and are less irritating than wettable powder. Granules and spray are equally effective. Granules are applied on the soil surface behind the press wheel. Rates of 5 to 6 qt Ramrod or 25 to 30 lb Ramrod 20G (broadcast) have been satisfactory in most SDSU tests. Spray formulations may be applied in liquid fertilizer. Minimum carrier is 15 gpa for ground equipment. Ramrod liquid may be applied by air using 5 gpa carrier. No carryover.

PREEMERGENCE. Requires ⅓ to ¾ inch rainfall within one week after application. Preferred application. Use shallow harrowing or rotary hoeing if weeds emerge before rainfall is received. Travel the same direction as the rows if banded. Do not incorporate.

RAMROD + ATRAZINE (PROPACHLOR + ATRAZINE)

*2½-4 qt Ramrod 4L + 1-1½ qt atrazine 4L or 1¼-2 lb atrazine 80W
or 1.1-1.7 lb atrazine 90WDG
3½-5½ qt Ramrod/atrazine*

(2½-4 + 1-1½ lb act)

Tank-mix of commercial premix containing 3 lb propachlor + 1 lb atrazine per gallon. Very good to excellent control of several annual grasses and several small-seeded annual broadleaves. Fair control of certain large-seeded annual broadleaves. Excellent crop tolerance. Consistent performance if rainfall received. Rates of 4 qt Ramrod + atrazine at 1 qt of 4L or 1¼ lb of 80W or 1.1 lb of 90 WDG formulation per acre have been satisfactory in most SDSU tests. Tank-mix preferred because it allows using low atrazine rates to minimize carryover. Liquid formulations easier to handle and are less irritating. Preemergence application may be made in liquid fertilizer. Minimum carrier is 15 gpa for ground application. Minimum carrier for aerial application is 4 gpa for Ramrod 4L and 5 gpa for Ramrod/atrazine premix. Refer to carryover crop limitations in atrazine section.

PREEMERGENCE. Preferred method. Refer to Ramrod section.

EARLY POSTEMERGENCE. May be applied until weeds have 2 leaves. Less consistent results. Do not use liquid fertilizer carrier. Use harrow or rotary hoe to remove emerged weeds.

PROWL (PENDIMETHALIN)

3-4 pt Prowl 4E (1½-2 lb act)

Good to very good control of several annual grasses and fair to good control of certain small-seeded annual broadleaves. Early season weed control less consistent than for some other treatments. Very good late season control. The 2 qt/A rate has been used in most SDSU tests. Fair crop tolerance. Do not incorporate, as crop injury can be severe. Planter furrow must be completely closed to insure good seed coverage. Plant before applying herbicide. Plant seed at least 1½ inch deep. Preemergence applications may be made in liquid fertilizer. Minimum carrier is 10 gpa for ground or 5 gpa for air. Increase carrier to 20 gpa for minimum till systems or when using fertilizer carrier. No label restrictions for crops planted the following year.

PREEMERGENCE. Requires ¾ to 1 inch of rain within one week after application. Rain very critical for good results. Do not harrow before crop emergence. However, if crusting or early weed emergence requires cultivation, use shallow tillage such as a rotary hoe.

1½-3 pt Prowl 4E (¾-1½ lb act)

POSTEMERGENCE INCORPORATED. Culti-spray application. Intended to provide control of late season annual weeds. Apply after corn is 4 inches tall. Cultivate before application to remove emerged weeds and to move untreated soil over corn root zone. Rate is 2 to 3 pt/A for most situations. Incorporate with cultivation. Incorporate soon after application unless sufficient rain is received or overhead irrigation used. Incorporation may be delayed up to 7 days. Very good late season grass control. Appears to have limited potential as a general weed program.

PROWL + ATRAZINE (PENDIMETHALIN + ATRAZINE)

1-1½ qt Prowl 4E + 1-1½ qt atrazine 4L or 1¼-2 lb atrazine 80W or 1.1-1.7 lb atrazine 90WDG (1-1½ + 1-1½ lb act)

Tank-mix. Good to very good control of several annual grasses and good control of several small-seeded annual broadleaves. Slightly better velvetleaf control than other preemergence combinations. Rates of 1½ qt Prowl + atrazine at 1 qt of 4L or 1¼ lb of 80W or 1.1 lb of 90 WDG have been used in SDSU tests. Refer to Prowl section for application directions and atrazine section for carryover crop limitations.

PREEMERGENCE. Refer to Prowl section. Slightly less consistent early season weed control than for other preemergence combinations. Do not incorporate as crop injury can be severe.

EARLY POSTEMERGENCE. Tank-mix. Apply before crop has more than 4 leaves. Weeds should be less than one inch tall. Has promise as an alternative where preemergence treatments have not been applied because of unforeseen delays. Will provide better weed control than preemergence application when rainfall is inadequate for preemergence treatments. Effective for wild proso millet. Some promise for minimum till systems. Do not use liquid fertilizer carrier.

1½-3 pt Prowl 4E + 1-1.2 qt atrazine 4L or 1¼-1½ lb atrazine 80W or 1.1 to 1.3 lb atrazine 90WDG

POSTEMERGENCE INCORPORATED. Tank-mix. Culti-spray application. Intended to provide control of late season annual weeds. Apply after corn is 4 inches tall. Cultivate before application to control emerged weeds and to move untreated soil over corn root zone. Incorporate as for Prowl alone applied postemergence incorporated. Appears to have limited potential as a general weed program.

PROWL + BLADEX (PENDIMETHALIN + CYANAZINE)

2-3 pt Prowl 4E + 1½-2½ qt Bladex 4L or 2-3 lb Bladex 80W (1-1½ + 1½-2½ lb act)

PREEMERGENCE. Tank-mix. Good to very good control of several grasses and some small-seeded annual broadleaves. Has been less consistent than other treatments in some tests. Do not incorporate, or crop injury can be serious. Rates of 3 pt Prowl + Bladex at 1½ qt of 4L or 2 lb of 80W formulation per acre have been used in most SDSU tests. Refer to application directions as for Prowl preemergence alone. No carryover.

2-3 pt Prowl 4E + 2-2½ lb Bladex 80W (1-1½ + 1½-2 lb act)

EARLY POSTEMERGENCE. Tank-mix. Apply before crop has more than 4 leaves. Weeds should be less than 1 inch. Has promise as an alternative when preemergence treatments were not applied because of unforeseen delays. Will provide better weed control than preemergence applications when rainfall is inadequate for preemergence treatments. Control of foxtail better than for Prowl + atrazine if grasses are under 1 inch. Effective for wild proso millet. Some promise for minimum till situations. Rate of 3 pt Prowl + 2½ lb Bladex 80W is suggested for most situations. Do not use Bladex 4L formulation. Risk of leaf burn under cold, wet weather. Note precautions as for Bladex postemergence alone. Do not use oil or surfactant additives. Do not use fertilizer carrier.

DUAL + BANVEL (METOLACHLOR + DICAMBA)

2-2½ pt Dual 8E + 1 pt Banvel 4L (2-2½ + ½ lb act)

PREEMERGENCE. Tank-mix. Very good to excellent control of several annual grasses. Good to excellent control of several small-seeded annual broadleaves. Short term control of certain large-seeded annual broadleaves. Performs better than other combinations when rainfall limited; however length of control is less when rainfall adequate. Reduces drift problem potential. Does not control perennials. Postemergence Banvel following preplant or preemergence treatments usually provides better control and is preferred for perennials. Plant corn at least 1½ inches deep. Risk of corn stunting if heavy rain occurs at emergence. Use only on medium or fine textured soils with over 2½% organic matter. Do not use on light, sandy soil. Not for furrow planted corn. Harrow or rotary hoe may be used to eliminate emerging weeds if rainfall is inadequate. May be applied in liquid fertilizer. Minimum carrier is 10 gpa.

LASSO + BANVEL (ALACHLOR + DICAMBA)

1½-4 qt Lasso 4E + ½-1 pt Banvel 4L (1½-4 + ¼-½ lb act)

PREEMERGENCE. Tank-mix. Refer to Dual + Banvel section. Use only on fine textured soil with over 3% organic matter. Rate of 2½ qt Lasso + 1 pt Banvel is labeled for heavier soils. Minimum carrier is 10 gpa.

EARLY POSTEMERGENCE. Tank-mix. Crop should be no more than 3 inches tall and weeds should have not more than 2 leaves. Adjust rate to soil texture. Use Banvel at ½ pt/A on coarse soil with less than 2½% organic matter and ¾ to 1 pt/A on medium and fine textured soil with more than 2½% organic matter. Lasso rate is 2½ to 3 qt for most soils. Minimum carrier is 10 gpa. Do not apply in liquid fertilizer.

PROWL + BANVEL (PENDIMETHALIN + DICAMBA)

1½ qt Prowl 4E + ¾-1 pt Banvel 4L (1½ + 3/8-½ lb act)

PREEMERGENCE. Refer to Dual + Banvel section. Use only on medium or fine textured soil having over 2½% organic matter. Do not use liquid fertilizer carrier. Use 10 gpa carrier for ground equipment.

ATRAZINE + BANVEL MARKSMAN (ATRAZINE + DICAMBA)

*1¼-4 qt atrazine 4L or 1½-5 lb atrazine 80W or 1⅓-4½ lb atrazine 90WDG + ½-1 pt Banvel 4L (1¼-4 + ¼-½ lb act)
2-3½ pt Marksman (.5-.9 + ¼-½ lb act)*

PREEMERGENCE OR EARLY POSTEMERGENCE. Tank-mix or use commercial premix (Marksman) containing 2.1 lb atrazine + 1.1 lb dicamba active per gallon. Dicamba controls emerged weeds, atrazine also provides residual control. Good to excellent control of annual broadleaves. Promising for velvetleaf and other difficult broadleaves. Annual grass control dependent on atrazine rate. Grasses should not exceed 1½ inches. Atrazine rates of 1½ to 2½ lb/A active suggested for most tank-mixes. Use lower Banvel rate on light soil; rates above ½ pt Banvel should be applied before corn exceeds 5-leaf stage. Marksman provides lower atrazine rates which reduce but do not eliminate risk of carryover. Intended for annual broadleaves only. Rates are 2 to 3½ pt Marksman per acre. Use the high rate on medium and fine soil with over 1% organic matter. Do not use crop oil or surfactants. Follow crop rotation guidelines for atrazine. Recommended amount of Marksman can be tank-mixed in the following combinations.

Marksman + atrazine. Add atrazine at 1¼ to 3 qt/A of 4L or 1½ to 3¾ lb of 80W or 1⅓ to 3⅓ lb of 90 WDG formulation per acre.

Marksman + Bladex. PREEMERGENCE. Add Bladex at 1¼ to 4 qt of 4L or 1½ to 5 lb of 80W or 1⅓ to 4½ lb of 90 DF formulation per acre. POSTEMERGENCE. Add 1½ to 2½ lb/A Bladex 80W. Refer to section for Bladex postemergence.

Marksman + Dual. PREEMERGENCE and EARLY POSTEMERGENCE. Apply on corn up to 3 inches. Add 1½ to 2½ pt Dual 8E. Use preemergence on fine textured soil containing 2½% or more organic matter.

Marksman + Lasso. PREEMERGENCE AND EARLY POSTEMERGENCE. Apply on corn up to 3 inches. Add 1½ to 4 qt Las-4E. Use preemergence only on fine textured soil containing 3% or more organic matter.

Marksman + Prowl. PREEMERGENCE. Add 1 to 2 qt Prowl 4E. For medium or fine textured soils containing 2½% or more organic matter.

Marksman + 2,4-D. PREEMERGENCE. Add ½ to 1 pt 2,4-D-3.8 lb/gal. POSTEMERGENCE. Add ¼-½ pt 2,4-D-3.8 lb/gal. Apply before corn exceeds the 5-leaf stage.

BLADEX + BANVEL (CYANAZINE + DICAMBA)

1 1/4-4 qt Bladex 4L or 1 1/2-5 lb Bladex 80W + 1/2-1 pt Banvel 4L (1 1/4-4 + 1/4-1/2 lb act)

PREEMERGENCE. Tank-mix. Good control of annual broadleaves; fair control of annual grasses. Rainfall required. Rates of 2 1/2 to 3 qt Bladex 4L or 3 to 3 3/4 lb Bladex 80W per acre suggested for most situations. Use preemergence only on medium and fine textured soils having over 2 1/2% organic matter. Apply as for Bladex alone.

1 1/2-2 1/2 lb Bladex 80W + 1/2-1 pt Banvel 4L (1 1/4-2 + 1/4-1/2 lb act)

POSTEMERGENCE. Tank-mix. Very Good control of annual broadleaves; fair to good control of annual grasses. Apply before corn is beyond the 4-leaf stage and before grasses are 1 inch tall. Use the high Banvel rate only on medium or fine soils with over 2 1/2% organic matter. The lowest rate is for light, sandy soil. Do not add crop oil or surfactant to postemergence applications. No carryover.

BANVEL (DICAMBA)

1/2-1 pt Banvel 4L (1/4-1/2 lb act)

Good to very good control of several small-seeded annual broadleaves and perennial broadleaves. Considered more effective than 2,4-D for Canada thistle, kochia, smartweed, or wild buckwheat. Does not control mustard. Better crop tolerance than 2,4-D, but can cause brittleness resulting in lodging or breakage. Risk of injury greatest during periods of rapid growth. Minimum carrier is 5 gpa for ground or 3 gpa for air; except as noted for areas when sensitive crops may be affected.

Use precautions to reduce risk of droplet drift. Most important factors are spraying in early-season and avoiding spraying when any wind is toward susceptible crops. Do not apply if wind is gusty or in excess of 5 mph and moving toward sensitive crops or if expected high temperature is over 80-85°F. Slight wind moving away from sensitive crops is preferred to calm conditions. Reduce risk of drift to susceptible crops by operating at less than 20 psi pressure and using at least 20 gpa carrier. Use drop nozzles if corn is over 8 inches, and apply by ground application only. Do not apply when soybeans are nearby if corn is over 24 inches tall or soybeans are over 8 inches or are starting to bloom. A June 20 cut-off date is suggested if soybeans are planted at normal dates. Sunflowers become more sensitive after they are beyond the 6-leaf stage. Do not harvest for dairy cattle prior to milk stage of kernel. Rates vary according to time of application.

PREPLANT. Banvel is useful to control emerged broadleaved weeds prior to planting in reduced till systems. Higher rates are used in the fall prior to spring planting to control broadleaved perennials. Late September applications on field bindweed and Canada thistle have been effective. Rates up to 1 pt/A may be used prior to planting on medium and fine soils. Rates up to 2 qt/A may be used during the season prior to planting corn.

EARLY POSTEMERGENCE. Apply 1/2 to 1 pt Banvel when corn is at spike stage to 5 inches tall. Useful for Canada thistle in seasons where weeds emerge early and are ahead of the corn. Some crop effects noted if heavy rainfall is received soon after application. Consider patch treatment.

POSTEMERGENCE. Apply 1/2 pt Banvel before corn is 36 inches tall or not later than 15 days before tassel. Use drop nozzles after corn is 8 inches tall to improve coverage and reduce risk of injury.

2,4-D

1/2-1 pt 2,4-D amine-3.8 lb/gal (1/4-1/2 lb act)

1/4-1/2 pt 2,4-D ester-3.8 lb/gal (1/8-1/4 lb act)

1/6-1/3 pt 2,4-D ester-5.7 lb/gal (1/8-1/4 lb act)

POSTEMERGENCE. Very good control of most emerged annual and perennial broadleaved weeds. Refer to Special Weed Problems section. If weed problems permit, spray before the plants are over 4 to 5 inches tall or delay application until after silks are brown. Use drop nozzles after corn is 8 inches tall (soil to tip of whorl leaf). If possible, avoid application during the period of rapid elongation. Do not apply later than 1 week before silking. Risk of brittleness increases in cool and wet or hot and humid conditions. Wind storms may cause lodging or breakage. Hybrids vary in tolerance; however, hybrid susceptibility is also affected by growing conditions. Drop nozzles reduce risk of injury. Avoid cultivation for 7 days after spraying. Do not use wetting agents or other additives. Slightly higher rates will improve perennial weed control, but risk of injury increases. Check product label.

Use precautions to reduce risk of droplet drift. It is most important to select a low vapor potential formulation and use a coarse spray. Do not apply if wind is gusty or moving toward sensitive crops. Slight wind moving away from sensitive crops is preferred to calm conditions. Less risk of vapor drift with amine formulations. Reduce risk of droplet drift by using less than 20 psi pressure and using at least 20 gpa carrier. Soybeans will be affected more at bloom stage. Sunflowers are more seriously affected by low concentrations as plant size increases.

HARVEST AID. Apply after silks are brown or after black layer stage. Dries weeds to facilitate harvest. Appears to substantially reduce amount and viability of cocklebur and sunflower seed. Good retreatment for perennials. Excellent crop tolerance. Use 1 lb/A act of ester or amine forms with high clearance sprayer. Formula 40 and Esteron 99 are labeled for aerial application.

BANVEL + 2,4-D AMINE (DICAMBA + 2,4-D)

1/2 pt Banvel 4L + 1/4-1/2 pt 2,4-D amine - 3.8 lb/gal (1/4 + 1/8-1/4 lb act)

Provides better control of more weeds than either herbicide used alone. Rates of 2,4-D have been reduced to improve crop tolerance. The lower 2,4-D rate is suggested for most small, susceptible weeds. Lower Banvel rates (1/4 pt/A) may be adequate for small weeds under ideal conditions. Follow drift and other precautions in Banvel or 2,4-D section. Refer to special weed section for hemp dogbane program using higher rates applied after silks are brown. Labeling includes ester forms of 2,4-D; however, amine forms provide better crop tolerance.

POSTEMERGENCE. Use drop nozzles after corn is 8 inches tall. Do not apply after corn is 36 inches tall or later than 15 days before tassel.

BASAGRAN (BENTAZON)

1 1/2-2 pt Basagran 4L (3/4-1 lb act)

POSTEMERGENCE. Excellent control of cocklebur. Very good control of sunflower and velvetleaf. Control is best on actively growing, small weeds. Lower rate is for cocklebur under 6 inches, velvetleaf under 2 inches, and sunflower under 4 inches. Use higher rate for cocklebur up to 10 inches, velvetleaf to 5 inches, and sunflower to 6 inches.

Oil concentrate is suggested for most situations. Use oil at rate of 1 qt/A in minimum of 20 gpa carrier with minimum of 40 psi pressure for ground and 1 pt/A oil in minimum of 5 gpa at 40 psi for air. Very good crop tolerance. Corn is usually at the 1- to 5-leaf stage when treated. Primarily for special situations where maximum crop safety is important. Basagran at 1/2 to 3/4 pt/A can be tank-mixed with atrazine at 1 to 1 1/2 pt of 4L or .6 to .8 lb of 80W or .6 to .8 lb of AAtrex Nine-O formulation per acre. Limited data. Do not mix with other herbicides. Do not treat corn under stress.

BUCTRIL or ME4 BROMINAL (BROMOXYNIL)

1-1 1/2 pt Buctril 2E or 1/2-1 pt ME4 Brominal 4E (1/4-1/2 lb act)

Contact herbicide. Very good to excellent control of annual broadleaves. Excellent for sunflower and cocklebur. Pigweed and wild mustard are somewhat tolerant. Velvetleaf control is variable; plants must be under 3 to 4 inches. Gives topgrowth burn on Canada thistle. No translocation to underground parts of perennials. Not intended as a "rescue" treatment for large weeds. No soil residual. Control is reduced if plants are under stress. Bromoxynil does not cause brittleness or lodging. No vapor drift. Some crop leaf burn is frequently noted. Wet foliage and high temperatures at time of spraying increase risk. Symptoms disappear as new growth develops. For ME4 Brominal, cocklebur, sunflower, smartweed, velvetleaf, and lambs-quarters should be treated at 2- to 4-leaf stage. Buctril applications on susceptible weeds should be made before they are 6 inches. More tolerant weeds such as pigweed, Russian thistle, mustard, and velvetleaf require the high rate before weeds reach 4 inches. Good coverage important. Minimum carrier is 5 gpa for air; 10 gpa for ME4 Brominal and 20 gpa for Buctril with ground equipment. Do not apply in liquid fertilizer, crop oil, or surfactant.

POSTEMERGENCE. Corn should have at least 2 fully expanded leaves before treating. Some injury has been associated with early application. Best stage is 4- to 8-leaf. Buctril can be applied at 1 pt/A at the 2- to 8-leaf crop stage or at 1 1/2 pt/A at the 4- to 8-leaf crop stage. ME4 Brominal is applied at 1/2 to 1 pt/A at the 2-leaf to 14-inch crop stage. Maximum rate is 3/8 lb active for most situations.

BUCTRIL or ME4 BROMINAL + ATRAZINE (BROMOXYNIL + ATRAZINE)

1-1 1/2 pt Buctril 2E + 1/2-1.2 qt atrazine 4L or .6-1.3 lb atrazine 90WDG (1/4-1/2 + 1/2-1.2 lb act)
1/2-1 pt ME4 Brominal 4E + 1/2-1 qt atrazine 4L or .6-1.1 lb atrazine 90WDG

Tank-mix. Atrazine improves control of some broadleaves and provides short residual activity. Follow crop limitations as for atrazine alone. Low atrazine rate reduces carryover and may allow rotating to crops with intermediate tolerance; however small grain is not recommended. Apply as for Buctril or ME4 Brominal alone.

POSTEMERGENCE. Follow crop growth stages as for Buctril or ME4 Brominal alone. Atrazine provides little improvement in control of larger weeds. Do not add crop oil.

BUCTRIL or ME4 BROMINAL + 2,4-D (BROMOXYNIL + 2,4-D)

1-1½ pt Buctril 2E or ½-1 pt ME4 Brominal 4E + ½ pt 2,4-D 3.8 lb/gal (¼-½ + ¼ lb act)

Tank-mix. 2,4-D improves control for some annual broadleaves and gives suppression of some perennials. Definite increased risk of crop injury compared to bromoxynil alone. Use caution to follow growth stages for each herbicide. Drop nozzles suggested after corn exceeds 8 inches. Amine form of 2,4-D preferred. Some lodging or brittleness expected.

POSTEMERGENCE. Follow crop growth stage minimum for Buctril and ME4 Brominal; however do not apply without drop nozzles after crop is 8 inches. Do not use crop oil or surfactants.

TREFLAN (TRIFLURALIN)

¾-2 pt Treflan 4E (3/8-1 lb act)

POSTEMERGENCE INCORPORATED. Incorporate with row cultivator. Intended to provide control of late season grasses. Apply after corn is 8 inches tall and incorporate with cultivator. Cultivate before application to remove emerged weeds and to move treated soil over corn root zone. Not labeled for preplant or preemergence use as injury can be severe. Not for seed fields. Appears to have limited potential as a general weed program.

NO-TILL CORN

Includes herbicides or uses primarily for no-till systems.

BRONCO (ALACHLOR + GLYPHOSATE)

3¼-5 qt Bronco

Commercial premix containing 2.6 lb alachlor (Lasso) + 1.4 lb glyphosate (Roundup) active per gallon. Intended to control emerged weeds in no-till situations. Excellent control of emerged annual grasses. Perennials may be suppressed. Lasso provides residual annual grass control if rainfall is received before more weeds emerge. Bronco can be tank-mixed with atrazine or Bladex to provide residual annual broadleaf control. Do not apply after crop emergence.

Bronco can be tank-mixed in the following combinations:

Bronco + Lasso. Add Lasso at ¾ to 2.2 qt/A depending on rate of Bronco.

Bronco + Roundup. Add Roundup at 1¼ to 2 qt/A depending on rate of Bronco.

Bronco + atrazine. Add atrazine at 1 to 2 lb/A active depending on soil texture.

Bronco + Bladex. Add Bladex at 1 to 2.2 lb/A active depending on soil texture.

Bronco + atrazine + Bladex. Add atrazine at ¾ to 1¼ lb/A active plus Bladex at 1 to 2 lb/A active per acre depending on soil texture.

AATREX (ATRAZINE)

4-6 pt AAtrex 4L or 2½-3¾ lb AAtrex 80W or 2.2-3.3 lb AAtrex Nine-O 90 WDG (2-3 lb act)

Early preplant applications of AAtrex may be applied alone or in combination with Dual. Intended to provide control for early season annual weeds and give residual activity into the season. Excellent broadleaf control; grass control may diminish during season. Combinations with Dual provide better grass control. Plant with no-till equipment to minimize soil disturbance. Appears to be a promising no-till system. Refer to crop rotation limitations and application directions as for atrazine alone.

EARLY PREPLANT SURFACE. Apply two thirds of the total amount as the first part of a split application if treating 30 to 45 days before planting and apply the remainder at planting. Applications less than 30 days before planting may be applied as a split or single application. Do not apply more than 2 weeks before planting on sandy soil. If weeds are emerged at application, add Paraquat or Roundup.

BLADEX (CYANAZINE)

1¼-4¾ qt Bladex 4L or 1½-6 lb Bladex 80W or 1½-5½ lb Bladex 90DF (1¼-4¾ lb act)

Bladex labeling has been expanded to include early preplant applications of Bladex alone or in labeled combinations. Intended to control early season weeds before planting and give residual activity for an extended period after planting. This gives additional time for adequate rainfall for other planting time herbicides. Appears to be a promising no-till system. Results in the Midwest have been very good. Performance best when applied early, before weed emergence. Control problems usually associated with wet spring conditions that delay early application and no addition of rainfall occur for the next 1 to 2 weeks. Very low and very high Bladex rates have not been tested in SDSU trials. Rates of 3 lb/A active Bladex alone or 2 lb/A active Bladex with 1 lb/A active atrazine have been satisfactory for early preplant applications in SDSU tests. The use of broadcast or band application of Dual or Lasso at planting improves seasonal grass control.

EARLY PREPLANT. Apply less than 15 days before planting. Apply Bladex alone or labeled preemergence combinations outlined for conventional tillage. Follow application suggestions outlined below for no-till. Use maximum rate or weed control may not last into the season. Some atrazine in the combination improves residual. Lasso or Dual plus Bladex and atrazine are one of the most promising combinations.

SPLIT EARLY PREPLANT AND PREEMERGENCE. Apply more than 15 days before planting. Best performance expected when the herbicide is applied in early spring before weeds emerge. This system provides the best early season control. No contact herbicide is required. Possible treatments with minimum rates for most soils follow.

Apply these treatments in early spring. Follow with 2 to 2½ pt/A Dual 8E or 2 to 2½ qt/A Lasso applied preemergence at planting. The grass herbicide may be banded to reduce cost. Another option which appears promising is to apply approximately ⅓ of the grass herbicide with the Bladex/atrazine and the remaining ⅔ at planting.

Other special application directions for Bladex early preplant in no-till include:

- a. Increase rate 25% over those listed if residue is heavy.
- b. Use only Bladex 80W formulation if residue is heavy. Equivalent amounts of Bladex 4L may be used on soybean stubble or other low residue situations.
- c. Add 1-1½ pt/A 2,4-D ester plus 1-2 qt X-77 per 100 gallons of solution if broadleaves have emerged.
- d. Nitrogen fertilizer increases burndown if weeds are small.
- e. If emerged weeds exceed 3 inches, add 2 pt/A paraquat using water carrier.
- f. Use minimum of 25 gpa carrier.

DUAL (METOLACHLOR)

2½-3 pt Dual 8E (2½-3 lb act)

Intended to provide initial control of early season weeds and residual control into the season. Weak on broadleaves. Rainfall required. Does not control emerged weeds. Add paraquat or Roundup if weeds emerged at application. Best results if applied before weed emergence. Refer to section for Dual alone for application directions. Plant with no-till equipment to minimize soil disturbance.

EARLY PREPLANT SURFACE. Apply two thirds of total amount as the first part of a split application if treating 30-45 days before planting and apply the remainder at planting. Applications less than 30 days before planting may be applied as a split or single application. Split application usually preferred for weed control into the season, especially if more than 14 days before planting. Do not apply more than 2 weeks before planting on sandy soil.

DUAL + AATREX (METOLACHLOR + ATRAZINE)

BICEP

2½-3 pt Dual + 3½-5 pt AAtrex 4L or 2-3 lb AAtrex 80W or 1¾-2¾ lb AAtrex Nine-0 90WDG (2½-3 + 1½-2½ lb act)

Intended to provide initial control of early season weeds and residual control into the season. Combination provides very good control of grasses and broadleaves. Rainfall required. Does not control emerged weeds. Best results if applied early, before weed emergence. Less control if spring conditions delay application until within one week of planting. Refer to the sections for Dual or atrazine alone for rotation limitations and application directions.

EARLY PREPLANT SURFACE. Apply two thirds of total amount as the first part of a split application if treating 30-45 days before planting and apply the remainder at planting. Applications less than 30 days before planting may be applied as a split or single application. Split application usually preferred for weed control into the season, especially if more than 14 days before planting. Do not apply more than 2 weeks before planting on sandy soil.

PARAQUAT PLUS or GRAMOXONE (PARAQUAT)

1-2 pt Paraquat Plus or Gramoxone 2L (1/4-1/2 lb act)

Paraquat is a non-selective, non-residual, contact herbicide which may be used at planting in combination with other herbicides in no-till or reduced tillage systems. Paraquat controls emerged grasses and broadleaves and topgrowth of perennials. Rates of 1 to 1 1/2 pt/A paraquat are adequate for most small weeds; high rate is for larger weeds or dense stands. Apply in a minimum of 20 gpa carrier. Non-ionic surfactant such as X-77 is important. Most mixtures with atrazine require 1 pt/100 gal of solution. Use 2 pt/100 gal of solution with most Bladex combinations or if a nitrogen fertilizer carrier is used. Liquid fertilizer containing phosphate will reduce paraquat activity. Paraquat is highly toxic; follow handling and safety precautions. Restricted Use pesticide. Several combination treatments for these systems are listed below.

Amount of product per acre, tank-mix. (Liquid formulations listed; however, an equivalent amount of other formulations may be used. Add X-77 at the rate of 1 to 2 pt/100 gal of solution.)

- 1-2 pt paraquat + 2-3 qt atrazine
- 1-2 pt paraquat + 1 1/4-4 qt Bladex
- 1-2 pt paraquat + 2-2 1/2 qt Lasso + 3/4-2 3/4 qt Bladex
- 1-2 pt paraquat + 1 1/2-2 1/2 pt Dual + 1-2 qt Bladex
- 1-2 pt paraquat + 1 1/2-2 1/2 pt Dual + 1 1/4-2 qt atrazine
- 1-2 pt paraquat + 2.4-4 qt Bicep
- 1-2 pt paraquat + 2-3 qt Lasso + 1-2 qt atrazine
- 1-2 pt paraquat + 2 1/2-3 1/2 qt Lasso or 2-2 1/2 pt Dual + 1/2-1 pt Banvel

ROUNDUP (GLYPHOSATE)

1-4 qt Roundup 3L (3/4-3 lb act)

Roundup is a non-selective, translocated, foliage applied herbicide used as a spot treatment for perennials or to control emerged weeds when used at planting in no-till or reduced tillage systems. There is no soil residual. All emerged vegetation will be damaged or killed.

SPOT TREATMENT. Corn will be killed in treated area. Use 2-4 qt/A Roundup. Weeds should be growing actively and have reached boot or bud stage. Primarily for field bindweed, Canada thistle, milkweed, or quackgrass. Consult label for precautions and mixing restrictions for hand equipment. Use extreme caution to prevent drift.

NO-TILL or REDUCED TILLAGE SYSTEMS. Controls emerged annual grasses and broadleaves. Use high rate for weeds over 6 inches tall. Follow all label precautions. Several combination treatments are listed below.

Amount of product per acre, tank-mix. (Liquid formulations listed; however, equivalent amount of other formulations may be used.)

- 1 1/2 qt Roundup + 1 1/2-2 1/2 pt Dual + 1 1/4-2 qt atrazine
- 1 1/2 qt Roundup + 2.4-4 qt Bicep
- 1-1 1/2 qt Roundup + 2-3 qt Lasso + 1-2 qt atrazine
- 1-1 1/2 qt Roundup + 2-3 qt Lasso + 1-2 1/4 qt Bladex
- 1-1 1/2 qt Roundup + 2 1/2-3 1/2 qt Lasso

SPECIAL WEED PROBLEMS IN CORN

Herbicides listed below are considered the best choice for the weed problem.
Results will vary according to local conditions.

ANNUAL GRASS (GREEN, YELLOW, AND BRISTLY FOXTAIL; SANDBUR)

ERADICANE Preplant incorporated. Excellent control of foxtail species. Best choice for sandbur. Good control of barnyardgrass. Most consistent of deeply incorporated treatments. Rates used in combination treatments also provide adequate grass control. Refer to Eradicane section.

SUTAN⁺ Preplant incorporated. Very good to excellent control of foxtail species. Good sandbur control. May be used in combination with other herbicides without reducing grass control. Refer to Sutan⁺ section.

**LASSO
or
DUAL** Preemergence or shallow preplant incorporated. Excellent control of most foxtail species. Late emerging yellow or bristly foxtail may escape. If used in combination treatment, use maximum rate of Lasso or Dual for soil type. Best control achieved with preemergence application with adequate rainfall. Variable on sandbur. Refer to section for Lasso or Dual.

RAMROD Preemergence. Excellent control of several foxtail species. Late season grasses may emerge, especially in wet seasons. Most consistent preemergence treatment in lower rainfall areas. Full rate for soil type when used alone gives best control. If used in combination treatment, use maximum rate of Ramrod for soil type. Refer to Ramrod section.

WILD OATS

ERADICANE Preplant incorporated. Most consistent and highest level of control. Use maximum rate for soil type. May be used in combination with other herbicides without reducing control. Refer to Eradicane section.

**ATRAZINE
+ OIL** Postemergence. Primarily a rescue treatment. Considerable variability. Use 2 lb/A act with full rate of crop oil. Note crop rotation limitations. Refer to atrazine section.

WILD CANE, WILD PROSO MILLET

**ERADICANE
EXTRA
or ERADICANE
or SUTAN⁺** Preplant incorporated. Rates higher than for annual grasses. Best control with 7 1/3 pt/A Eradicane or Sutan⁺. Lower rate gives less control. Eradicane gives slightly better control at equivalent rates. May be mixed with atrazine or Bladex if Eradicane or Sutan⁺ rate is not reduced. Refer to Eradicane or Sutan⁺ section. May be followed by early postemergence Prowl + Bladex 80W or Prowl + atrazine where wild proso is severe.

**PROWL +
ATRAZINE
or
BLADEX 80W** Early postemergence. Fair to good control of wild proso millet. Apply before 2-leaf crop stage. May be used in a program following a preplant incorporated herbicide. May provide satisfactory control in light infestations without preplant herbicides.

LASSO Special rates. Fair to good shattercane control. Apply 4 qt/A shallow preplant incorporated and apply 2 qt/A preemergence to 4-leaf crop stage but before weed emergence.

SMALL-SEEDED ANNUAL BROADLEAVES (KOCHIA, RUSSIAN THISTLE, PIGWEED, LAMBSQUARTERS)

ATRAZINE Excellent control with preplant or preemergence atrazine alone or with 1 to 1 1/2 lb/A act used in combination with other herbicides. Better late season control than with Bladex, especially in wet seasons. Atrazine plus crop oil early postemergence gives very good control. Note crop rotation limitations. Refer to atrazine section.

BLADEX Very good to excellent control with full preemergence rate for soil type. Combination rate of 1.5 lb/A act used with other herbicides gives good control. Weak on pigweed. Early postemergence treatments with 1.5 lb/A act with a non-petroleum surfactant gives good to very good control. Some risk of leaf burn. Refer to Bladex section.

**BANVEL +
2,4-D AMINE** Postemergence. Better than 2,4-D alone for kochia. Rates of 1/4 to 1/2 pt/A 2,4-D amine + Banvel are satisfactory for small weeds and reduce risk of crop injury when compared to maximum rates. Use drop nozzles after corn is 8 inches tall. Moderate crop tolerance. Refer to Banvel + 2,4-D section.

SUNFLOWER, COCKLEBUR

ATRAZINE Rate of 2 to 3 lb/A act atrazine applied preplant incorporated gives good control. Sunflower control better than cocklebur. Lower rates in combination treatments give partial control. Seedlings emerging from depths below the treated area may escape. Postemergence application of 1½ to 2 lb/A act atrazine with crop oil gives very good control of emerged weeds. Note crop rotation limitations in atrazine section.

BLADEx Full rate for soil type applied preemergence gives fair to good control if rainfall received. Sunflower control better than cocklebur. Lower rates used in combination provide partial control. Early postemergence application of 1½ lb/A act cyanazine gives good control of emerged weeds. Refer to Bladex section.

2,4-D Postemergence applications give very good control of emerged weeds under 6 inches tall. Ester formulations give better control of larger weeds. Later emerging weeds will escape. Pre-harvest applications of 1 lb/A act after the silks are brown but before seeds are developed will reduce weed populations the next year. Becoming very popular. Refer to 2,4-D amine section.

BANVEL + 2,4-D AMINE Postemergence application of ¼ (dicamba) plus 1/8 to 1/4 (2,4-D amine) lb/A act gives very good control of emerged weeds under 6 inches tall. Use drop nozzles after corn is 8 inches tall. Refer to Banvel + 2,4-D amine section.

BASAGRAN Postemergence. Very good control. Cocklebur more sensitive than sunflower. Most potential where carryover and drift must be avoided and where crop tolerance is a major factor. Refer to Basagran section.

BUCTRIL or ME4 BROMINAL Postemergence. Very good control. Refer to Buctril or ME4 Brominal section.

VELVETLEAF, VENICE MALLOW

ATRAZINE Rates of 2 to 3 lb/A act atrazine applied as a shallow preplant incorporated treatment provide very good control. Use maximum rate for soil type. Preemergence application less consistent. Postemergence application of 1½ to 2 lb/A act atrazine plus crop oil gives very good control. Lower rates used in combination with other herbicides give 20 to 40% less control. Atrazine better than Bladex. Note crop rotation limitations in atrazine section.

ERADICANE + ATRAZINE Eradicane at 4¾ pt/A applied preplant incorporated + 1½ lb/A act atrazine gives very good control. Rates of Eradicane up to 7½ pt/A improve results. Refer to Eradicane + atrazine section.

2,4-D or BANVEL + 2,4-D AMINE Postemergence. 2,4-D alone or 2,4-D amine in combination with Banvel at recommended rates gives better control than Banvel alone. Preharvest application of 2,4-D less effective in reducing seed production than for some other weeds. Marginal crop tolerance. Refer to 2,4-D or Banvel + 2,4-D section.

BASAGRAN Postemergence. Good to very good control. Refer to sunflower/cocklebur section above and Basagran section.

QUACKGRASS

ATRAZINE SPLIT APPLICATION. very good control. Apply 2 lb/A act atrazine in fall or spring. Plow 1 to 3 weeks later. Make a second application of 2 lb/A act in the spring as a preplant, preemergence, or postemergence application. Best annual weed control.

SINGLE APPLICATION. Apply 4 lb/A act in fall or spring. Plow 1 to 3 weeks later. Corn must be planted for 2 years with either system. Plan to cultivate crop.

ROUNDUP Apply in fall after harvest or in spring before late planted crop. Quackgrass should be actively growing and at least 8 inches tall. Fall treatment gives better control. All emerged weeds are affected. Roundup is translocated throughout the plant. Do not till in the fall or spring prior to spring application. Delay planting as long as possible to allow for maximum growth. Do not till for 3 days after application. Use 1 to 2 qt/A Roundup. Add ½-1% surfactant for low rate. No carryover or residual weed control. Plan to cultivate crop.

SPOT TREATMENT. Refer to Roundup section.

CANADA THISTLE, FIELD BINDWEED

BANVEL Postemergence. Use 1 pt/A Banvel at spike to 5 inches. Best treatment for early application on Canada thistle when weed growth rate exceeds that of the corn. Reduce rate to ½ pt/A for later treatments.

BANVEL + 2,4-D AMINE Postemergence. Combination gives very good suppression of emerged plants. Better control than either herbicide used alone. Treat patches only. Use maximum rates for best results. Application with drop nozzles after first cultivation will give best fall suppression but may be applied over the top until corn is 8 inches tall. Best treatment for field bindweed. Marginal crop tolerance. Refer to Banvel + 2,4-D section.

2,4-D Postemergence. Use drop nozzles after corn is over 8 inches tall. Amines are used at slightly higher rate and give slower kill. Some labels allow for higher rates to improve control, but risk of injury increases. Marginal crop tolerance. Refer to 2,4-D section.

ROUNDUP Spot treatment. Refer to Roundup section.

HEMP DOGBANE

BANVEL + 2,4-D AMINE Preharvest. Treat after the silks are brown and the dogbane has enlarged, pink root buds, but before leaves begin to yellow. Weeds must be growing actively. Gives 60 to 80% control. Use ½ pt Banvel + 1 lb/A act 2,4-D amine. Apply with ground or air equipment. Do not apply within 30 days of harvest. Refer to Banvel + 2,4-D amine section.

COMMON MILKWEED

BANVEL Postemergence. Poor to fair suppression. Does not reduce stands. Better than 2,4-D. Use 1 pt/A before corn is 5 inches. Reduce to ½ pt/A if crop exceeds 5 inches. Plowing helps weaken weeds. Refer to Banvel section.

VOLUNTEER ALFALFA

BANVEL + 2,4-D AMINE Postemergence. Use rates of ½ pt Banvel + ¼ to ½ lb/A act 2,4-D amine. Follow precaution and directions in Banvel + 2,4-D section.

YELLOW NUTSEDGE

ERADICANE or SUTAN⁺ Preplant incorporated. Use 4¾ to 7½ pt/A. Higher rate improves results. Good control. Eradicane better than Sutan⁺ at equal rates. May be used in combination with other herbicides if Eradicane or Sutan⁺ rate is not reduced. Soil should be worked thoroughly. Use with cultivation. Refer to Eradicane or Sutan⁺ section.

DUAL or LASSO Shallow preplant incorporated. Use maximum rate for soil type. Good to very good control. Dual slightly more effective. May be used in combination with other herbicides if Dual or Lasso rate is not reduced. Use with cultivation. Refer to Dual or Lasso section.

BASAGRAN Postemergence when weed is 6-8 inches tall. Good control. Two applications of 1½ to 2 pt/A split 7 to 10 days apart give best control. Useful for spot treatment or as a followup. Refer to Basagran section.

ATRAZINE Shallow preplant incorporated applications of 4 lb/A act atrazine provide fair to good control. Early postemergence application of 2 lb/A act with crop oil applied when weed is 2 to 3 inches tall gives about equal control. Seedbed should be thoroughly tilled. Use with cultivation. Refer to atrazine section for carryover crop limitations.

Herbicides For Sweet Corn

The following are labeled for sweet corn. Check the product label for special precautions.

AAtrex/atrazine
 Basagran
 Bicep
 Bladex
 Dual
 Dual + atrazine
 Eradicane
 Eradicane Extra
 Eradicane + atrazine
 Eradicane + Bladex
 Eradicane + Bladex + atrazine
 Lasso
 Lasso + atrazine
 Lasso + Bladex
 Lasso + Bladex + atrazine
 Ramrod
 Ramrod + atrazine
 Sutan⁺ or Genate Plus
 Sutan⁺ + atrazine
 Sutan⁺ + Bladex
 Sutan⁺ + Bladex + atrazine
 2,4-D

Herbicide Cost

The table below gives the cost per acre for several herbicide treatments based on average prices for the previous season or current season price information available. Cost for low and high rates are listed. Prices vary according to location and quantity. Consult your local dealer for actual prices.

HERBICIDE	AMT of PRODUCT/A	HERBICIDE COST/A
Atrazine	2-3 qt	\$ 4.20- 6.30
Atrazine + oil	1 1/4-2 qt + 1 qt	4.15- 5.70
Atrazine + Banvel	1 1/4-4 qt + 1/2-1 pt	6.00-14.90
Banvel	1/2-1 pt	3.25-6.50
Banvel + 2,4-D amine	1/2 pt + 1/4-1/2 pt	3.50- 3.75
Basagran	1 1/2-2 pt	15.75-21.00
Bladex	1 1/4-4 3/4 qt	5.75-21.85
Bladex + Banvel	1 1/4-4 qt + 1/2-1 pt	9.00-24.90
Buctril	1-1 1/2 pt	5.00- 7.50
ME4 Brominal	1/2-1 pt	4.90- 9.80
Dual	1 1/2-3 pt	9.40-18.75
Dual + atrazine (Bicep)	1 1/2-2 1/2 pt + 1-2 qt	11.50-19.85
Dual + Bladex	1 1/2-2 1/2 pt + 3/4-3 qt	12.85-29.45
Dual + atrazine + Bladex	1 1/2-2 1/2 pt + 1/2-2 pt + 1/2-2 qt	12.20-26.95
Dual + Banvel	2-2 1/2 pt + 1 pt	19.00-22.15
Eradicane	3 3/4-4 3/4 pt	10.95-13.90
Eradicane + atrazine	3 3/4-4 3/4 pt + 1-1 1/2 qt	13.05-17.05
Eradicane + Bladex	3 3/4-4 3/4 pt + 3/4-3 qt	14.40-27.70
Eradicane + atrazine + Bladex	3 3/4-4 3/4 pt + 1/2-2 pt + 1/2-2 qt	13.80-25.20
Lasso	2-3 1/2 qt	10.50-18.40
Lasso + atrazine	2-3 qt + 1-1 1/2 qt	12.60-18.90
Lasso + Bladex	2-3 qt + 3/4-3 qt	13.95-29.55
Lasso + atrazine + Bladex	2-3 qt + 1/2-2 pt + 1/2-2 qt	13.45-27.05
Lasso + Banvel	1 1/2-3 1/2 qt + 1/2-1 pt	11.15-24.90
Paraquat	1-2 pt	5.90-11.75
Prowl	2-4 pt	5.65-11.25
Prowl + atrazine	1-1 1/2 qt + 1 1/2-2 qt	8.80-12.65
Prowl + Bladex	1-1 1/2 qt + 1 1/2-2 qt	12.55-17.65
Prowl + Banvel	1 1/2 qt + 3/4-1 pt	13.30-14.95
Ramrod	4-6 qt	16.00-24.00
Ramrod + atrazine	2 1/2-4 qt + 1-1 1/2 qt	12.10-19.15
Roundup	1-4 qt	21.25-85.00
Sutan ⁺ , Genate Plus	4 3/4 pt	12.50
Sutan ⁺ + atrazine	3 3/4-4 3/4 pt + 1-1 1/2 qt	10.90-14.05
Sutan ⁺ + Bladex	3 3/4-4 3/4 pt + 3/4-3 qt	13.30-26.30
Sutan ⁺ + atrazine + Bladex	3 3/4-4 3/4 pt + 1/2-2 pt + 1/2-2 qt	12.75-23.75
Treflan	3/4-2 pt	2.40- 6.30
2,4-D	1/2-1 pt	.50- 1.00