Chemical Weed Control in Corn: 1984

Cooperative Extension South Dakota State University

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Chemical Weed Control in Corn: 1984

Leon J. Wrage, Extension agronomist, weeds
W. E. Arnold, Professor, plant science

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. Trade names 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, lambsquarters, 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:
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 improve 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.

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.
### Abbreviations Used

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>pt</td>
<td>pint</td>
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<tr>
<td>qt</td>
<td>quart</td>
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<tr>
<td>lb</td>
<td>pound</td>
</tr>
<tr>
<td>gpa</td>
<td>gallons per acre</td>
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<tr>
<td>lb/gal</td>
<td>pound per gallon (active ingredient or acid equivalent)</td>
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<tr>
<td>W</td>
<td>wettable powders</td>
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<tr>
<td>L</td>
<td>liquid flowable</td>
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<tr>
<td>DF</td>
<td>dry flowable (spray)</td>
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<tr>
<td>gran (G)</td>
<td>granule</td>
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<tr>
<td>act</td>
<td>actual, active, or acid equivalent</td>
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<tr>
<td>a.e.</td>
<td>acid equivalent</td>
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### Herbicides

The herbicide products discussed in this publication are listed below.

<table>
<thead>
<tr>
<th>Product</th>
<th>Active Ingredient</th>
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<tbody>
<tr>
<td>Atrazine 4L</td>
<td>4 lb/gal (liquid)</td>
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<tr>
<td>Atrazine 80W</td>
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<td>Atrex Nine-O</td>
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<td>Banvel II</td>
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<tr>
<td>Ramrod</td>
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<td>Sencor 75DF</td>
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<tr>
<td>Genate Plus</td>
<td>3.8 or 5.7 lb/gal a.e. (liquid)</td>
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<tr>
<td>2,4-D</td>
<td>3.8 or 5.7 lb/gal a.e. (liquid)</td>
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## CORN HERBICIDES

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

3¾-4¾ pt Eradicane or 4-5½ pt Eradicane Extra (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 7½ pt/A Eradicane or 8 pt/A Eradicane Extra is suggested for yellow nitsedge, 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 fertilizers. 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)

3¼-4¾ pt Eradicane or 4-5½ pt Eradicane Extra + 1-1½ qt atrazine 4L or 1¼-2 lb atrazine 80W or 1.1-1.7 lb AAtrex Nine-O (3-4 + 1-1½ 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. Better late season control than extremely cool soil conditions. Adequate crop tolerance. Use the lower rates on light, low organic matter soil. Rates of 4 pt Eradicane or 4½ pt Eradicane Extra + atrazine at 1 qt of 4L or 1½ lb of 80W or 1 lb AAtrex Nine-O formulation per acre have been satisfactory in most SDSU tests. Rate of 7¼ 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.

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

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

3¼-4¾ pt Eradicane or 4-5½ pt Eradicane Extra + 1½-3 qt Bladex 4L or 2-3¾ lb Bladex 80W (3-4 + 1½-3 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 4½ pt Eradicane Extra + Bladex at 1½ qt of 4L or 2 lb or 80W formulation per acre have been satisfactory in most SDSU tests. Rate of 7¼ 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.

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

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

3¼-4¾ pt Eradicane or 4-5½ pt Eradicane Extra + 1-2 qt Bladex 4L or 1¼-2½ lb Bladex 80W + 1-2 pt atrazine 4L or ¾-1½ lb atrazine 80W or .6-1.1 lb AAtrex Nine-O (3-4 + 1-2 + ¼-1 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 4½ pt Eradicane Extra + Bladex at 1½ qt of 4L or 2 lb or 80W + atrazine at 1 pt of 4L or ½ lb of 80W or ½ lb of AAtrex Nine-O 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 7¼ 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\textsuperscript{*} or GENATE PLUS \textbf{(BUTYLATE + SAFENER)}

\textit{4¾ pt Sutan\textsuperscript{*} or Genate Plus (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 7½ 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\textsuperscript{*} or GENATE PLUS + ATRAZINE \textbf{(BUTYLATE + SAFENER + ATRAZINE)}

SUTAZINE\textsuperscript{*}

\textit{3¾-4¾ pt Sutan\textsuperscript{*} or Genate Plus + 1-1½ qt atrazine 4L or 1¼-2 lb atrazine 80W or 1.1-1.7 lb AAtrex Nine-O (3-4 + 1-1½ lb act)}

\textit{5¼-7 pt Sutazine\textsuperscript{*}}

Tank-mix or use commercial premix (Sutazine\textsuperscript{*}) 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. 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 4¾ pt Sutan\textsuperscript{*} or Genate Plus + atrazine at 1 qt of 4L or 1¼ lb of 80W or 1.1 lb of AAtrex Nine-O formulation per acre or 7 pt/A Sutazine\textsuperscript{*} have been satisfactory in most SDSU tests. 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\textsuperscript{*} or Genate Plus alone.

SUTAN\textsuperscript{*} or GENATE PLUS + BLADEX \textbf{(BUTYLATE + SAFENER + CYANAZINE)}

\textit{3¾-4¾ pt Sutan\textsuperscript{*} or Genate Plus + 1½-3 qt Bladex 4L or 2-3¼ lb Bladex 80W (3-4 + 1½-3 lb act)}

Tank-mix. Very good to excellent control of many annual grasses and several small-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 2% organic matter. Rates of 4¼ pt Sutan\textsuperscript{*} or Genate Plus + Bladex at 1½ qt of 4L or 2 lb of 80W formulation per acre have been satisfactory in most SDSU tests. 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. Do not use on corn seed fields.

PREPLANT INCORPORATED. Incorporate as for Sutan\textsuperscript{*} or Genate Plus alone.

SUTAN\textsuperscript{*} + BLADEX + ATRAZINE \textbf{(BUTYLATE + SAFENER + CYANAZINE + ATRAZINE)}

\textit{3¾-4¾ pt Sutan\textsuperscript{*} + 1-2 qt Bladex 4L or 1¼-2½ lb Bladex 80W + 1-2 pt atrazine 4L or 3¾-1¼ lb atrazine 80W or .6-1.1 lb AAtrex Nine-O (3-4 + 1-2 + 1½-1 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. Label rate is 1 lb/A active atrazine; however, the lower rate suggested above has been satisfactory in SDSU tests where carryover must be minimized to allow for additional rotational crops. 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\textsuperscript{*} alone. Refer to Sutan\textsuperscript{*} + Bladex or atrazine sections.
ATRAZINE (ATRAZINE)

2-3 qt atrazine 4L or 2½-3¾ lb atrazine 80W or 2.2-3.3 lb AAtrex Nine-0 (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 2½ qt of 4L or 3 lb or 80W or 2¾ lb of AAtrex Nine-0 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 applied herbicides. Soybeans and flax usually tolerate carryover from rates up to 1 qt/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 for ground application is 5 gpa for 4L and 10 gpa for other formulations.

SHALLOW PREPLANT INCORPORATED. Incorporate into the top 2 inches of soil 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 ½ 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 1½ inches tall. Apply by using minimum of 2 gpa by air or 5 gpa for liquid and 10 gpa for other formulations by ground.

EARLY POSTEMERGENCE. With crop oil. Atrazine + crop oil is applied at 1¼ to 2 qt of 4L or 1½-2½ lb 80W or 1.3-2.2 lb AAtrex Nine-0 formulation per acre + crop oil. Weeds should be less than 1½ inches high. Very good control of several emerged annual broadleaves and poor to fair control of most annual grasses. Some leaf burn on perennials but little stand reduction. Most consistent on broadleaves. Use high rate for grasses and for longer residual control. Rainfall, high humidity, and dew improve results. Intended to be followed with cultivation.

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 ½ gpa for aerial application. Use oil concentrate at the rate of 1 qt/A for ground application. Some crop yellowing or leaf tip burn may occur under cool, wet conditions. Do not add 2,4-D or Banvel. Minimum carrier is 10 gpa for ground and 2 gpa for air. Do not use liquid fertilizer carrier. Refer to atrazine section for carryover crop limitations.

LASSO (ALACHLOR)

2-3½ qt Lasso or 16-26 lb Lasso II (2-3½ 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 2½ 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 and 3 gpa for air. Granule and spray formulations appear to be equally effective. Granules are applied to the soil surface behind the press wheel. Do not exceed the recommended rate for granules. No carryover.

SHALLOW PREPLANT INCORPORATED. Incorporate Lasso spray into the top 2 inches of soil with field cultivator, shallow disk, multiweeder, or other suitable implements during final seedbed preparation. Flextine 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 3½ qt/A Lasso has been used in most tests.

PREEMERGENCE. Requires ½ to ¾ 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 + 1-1½ qt atrazine 4L or 1¼-2 lb atrazine 80W or 1.1-1.7 lb AAtrex Nine-O

3-4 qt Lasso/ Atrazine

Tank-mix or use commercial premix (Lasso/ Atrazine) containing 2½ lb alachlor + 1½ 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 2½ qt Lasso + atrazine at 1 qt of 4L or 1½ lb of 80W or 1.1 lb of AAtrex Nine-O formulation per acre have been satisfactory for most preemergence SDSU tests. Rates of 3 qt Lasso + atrazine at 2 qt of 4L or 2½ lb of 80W or 2¼ lb of AAtrex Nine-O formulation per acre can be used for minimum till systems when planting into heavy residue from the previous crop. Preplant incorporated 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 + 1-3 qt Bladex 4L or 1¼-3¾ lb Bladex 80W (2-3 + 1-3 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 2½ qt Lasso + Bladex at 1 ½ qt of 4L or 2 lb of 80W formulation per acre have been satisfactory for most preemergence SDSU tests. 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 and 4 gpa for air. No carryover.

SHALLOW PREPLANT INCORPORATED. Incorporate as for Lasso alone. Add 1 pt Lasso or Bladex at ½ pt of 4L or ½ 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 + 2-4 pt Bladex 4L or 1¼-2½ lb Bladex 80W + 1-2 pt atrazine 4L or ½-1½ lb atrazine 80W or .6-1.1 lb AAtrex Nine-O (2-3 + 1-2 + ½-1 lb act)

1½-2½ pt Dual RE + 2-4 pt Bladex 4L or 1¼-2½ lb Bladex 80W + 1-2 pt atrazine 4L or ½-1½ lb atrazine 80W or .6-1.1 lb AAtrex Nine-O (1½-2½ + 1-2 + ½-1 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 2½ qt Lasso or 2 to 2½ pt Dual + Bladex at 1½ qt of 4L or 2 lb of 80W + atrazine at 1 pt of 4L or .6 lb of 80W or .6 lb of AAtrex Nine-O 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. Lasso combinations only. Incorporate as for Lasso alone. Use 1 pt/A more Lasso than for preemergence.

PREEMERGENCE. Refer to Lasso or Dual section.
DUAL (METOLACHLOR)

2-3 pt Dual 8E or 6-12 lb Dual 25G (2-3 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. Weed control similar to alachlor when used preemergence in approximately equal rates. 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. Limited data for granules. Granules usually applied to the soil surface behind the press wheel. Calibrate and apply accurately to avoid excessive rates. No carryover.

SHALLOW PREPLANT INCORPORATED. Incorporate into top 2 inches of soil with field cultivator, shallow disk, multiweeder, or other suitable implements during final seedbed preparation. 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 to¾ inch rain within one week after application. Harrow or rotary hoe if weeds emerge before rainfall. Travels 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 1-2 lb AAtrex Nine-0

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 AAtrex Nine-O 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. The Dual + atrazine combination to 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.

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 + 1-3 qt Bladex 4L or 1¼-3¾ lb Bladex 80W (1½-2½ + 1-3 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. 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.

SHALLOW PREPLANT INCORPORATED. Incorporate as for Dual alone.

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

525C/7
RAMROD (PROPACHLOR)

4-6 qt Ramrod 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 ½ 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 + 1-1½ qt atrazine 4L or 1½-2 lb atrazine 80W or 1.1-1.7 lb AAtrex Nine-0

5-8 lb Ramrod/Atrazine

Tank-mix of commercial wettable powder premix containing 48% propachlor + 20% atrazine. 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 1½ lb of 80W or 1.1 lb of AAtrex Nine-O 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 20 gpa (15 gpa for Ramrod liquid). Ramrod liquid is labeled for aerial application using 4 gpa carrier. 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.

BANVEL (DICAMBA)

½-1 pt Banvel or 1-2 pt Banvel II (¼-½ 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. Banvel contains 4 lb/gal acid equivalent. Banvel II contains 2 lb/gal sodium salt of dicamba. Banvel II is reported to reduce risk of vapor drift and is intended for use in those situations. However the same precautions are suggested, as the potential for droplet drift remains the same. 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.

EARLY POSTEMERGENCE. Apply ½ to 1 pt Banvel or 1 to 2 pt Banvel II 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 ½ pt Banvel or 1 pt Banvel II before corn is 36 inches tall or not later than 15 days before tassel. Drop nozzles after corn is 12 to 16 inches tall improve coverage and reduce risk of crop injury.
**BLADEX + ATRAZINE (CYANAZINE + ATRAZINE)**

1.1–1 ¾ lb Bladex 80W + 1/2–¾ lb atrazine 80W (1–1 ½ + .4–.6 lb act)

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 ½ inches tall. Suggested rates are 1.1 to 1 ¾ lb/A Bladex 80W + ½ to ¾ lb atrazine 80W 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.

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

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

½ pt Banvel + ¼–½ 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 (¼ 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. Banvel II is not labeled for use in a tank-mix with 2,4-D amine. 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.

**2,4-D**

½–1 pt 2,4-D amine-3.8 lb/gal (¼–½ lb act)

¼–½ 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.
OTHER CORN HERBICIDES

BLADEX (CYANAZINE)

1¾-4¾ qt Bladex 4L or 1½-6 lb Bladex 80W

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. Do not use on sandy soils. 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.

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 ¾ to 1 inch of rain within one week of application. Use a harrow or rotary hoe to remove weeds that emerge before rainfall.

PREEMERGENCE . Use a harrow or rotary hoe to remove weeds that emerge before rainfall. EARLY POSTEMERGENCE. Results. Apply before weeds are over 1½ inch tall and before corn has more than 4 leaves. Variable; however, grass and annual broadleaf control can be very good to excellent under good conditions. Wettable powder only. Use 1½ to 2½ lb/A Bladex 80W. Some risk of crop injury. Yellowing and leaf tip burn may be noted with cool, wet conditions. Rainfall, dew, or high humidity improves results. In dry conditions, add a non-petroleum based surfactant. Not for use on seed production fields. Minimum carrier is 15 gpa for ground or 4 gpa for air.

PROWL (PENDIMETHALIN)

2-4 pt Prowl

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. Do not incorporate, as crop injury can be severe. The 2 qt/A rate has been used in most SDSU tests. Fair crop tolerance. Increase carrier to 20 gpa for minimum till systems when planting into heavy residue from the previous crop. Planter furrow must be completely closed to insure good seed coverage. Plant before applying the herbicide. Preemergence applications may be made in liquid fertilizer. Minimum carrier is 10 gpa for ground or 5 gpa for air. No carryover.

PREEMERGENCE. Requires ¾ to 1 inch of rainfall within one week after application. Rainfall very critical for good results. Do not harrow before crop emergence. 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. A second incorporation is required. Very good late season grass control. Appears to have limited potential as a general weed program.

PROWL + ATRAZINE (PENDIMETHALIN + ATRAZINE)

1-1½ qt Prowl + 1-1½ qt atrazine 4L or 1¼-2 lb atrazine 80W or 1.1-1.7 lb AAtrex Nine-O 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 AAtrex Nine-O 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.

EARLY POSTEMERGENCE. Apply before crop has more than 2 leaves. 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.

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 control emerged weeds. Incorporate with cultivation. A second incorporation is required. Appears to have limited potential as a general weed program.
PROWL + BLADEX (PENDIMETHALIN + CYANAZINE)

1-1½ qt Prowl + 1½-2 qt Bladex 4L or 1¼-2½ lb Bladex 80W

Tank-mix. Good to very good control of several annual grasses and several small-seeded annual broadleaves. Rates of 1½ qt Prowl + Bladex at 1½ qt of 4L or 2 lb of 80W formulation per acre have been used in most SDSU tests. Application equipment directions same as for Prowl alone.

EARLY POSTEMERGENCE. Apply before crop has more than 2 leaves. Annual grasses 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. Do not use Bladex 4L formulation. Do not use fertilizer carrier.

PREEMERGENCE. Refer to Prowl section. Has been less consistent than other treatments in some tests.

DUAL + BANVEL (METOLACHLOR + DICAMBA)

2-2½ pt Dual BE + 1 pt Banvel

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. 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)

2½ qt Lasso + 1 pt Banvel

PREEMERGENCE. Refer to Dual + Banvel section. Minimum carrier is 10 gpa.

EARLY POSTEMERGENCE. Crop should be no more than 3 inches tall and weeds should have not more than 2 leaves. Apply in minimum of 15 gpa water. Slightly less risk of crop injury from Banvel, but chance of reduced grass control from Lasso.

PROWL + BANVEL (PENDIMETHALIN + DICAMBA)

1½ qt Prowl + ½-1 pt Banvel

PREEMERGENCE. Refer to Dual + Banvel section. Use lower rate on lighter textured soils.

ATRAZINE + BANVEL (ATRAZINE + DICAMBA)

1¼-4 qt atrazine 4L or 1½-5 lb atrazine 80W or 1¼-4½ lb AAtrex Nine-O + ½-1 pt Banvel

PREEMERGENCE OR EARLY POSTEMERGENCE. Tank-mix. Good control of annual broadleaves, poor to good control of annual grasses. Rainfall required for preemergence. Postemergence applied before grasses are 1½ inches tall. Do not use crop oil or surfactant. Atrazine rates of 1½ to 2½ lb/A active suggested for most situations. Follow crop rotation guidelines for atrazine. Other treatments using these herbicides appear to perform better in most situations.

BLADEX + BANVEL (CYANAZINE + DICAMBA)

1½-4 qt Bladex 4L or 1½-5 lb Bladex 80W + ½-1 pt Banvel

PREEMERGENCE OR POSTEMERGENCE. Tank-mix. Good control of annual broadleaves; fair control of annual grasses. Rainfall required for preemergence. Rates of 2½ to 3 qt Bladex 4L or 3 to 3.8 lb Bladex 80W per acre are suggested for most preemergence situations. Use lower Banvel rate on lighter soil. Postemergence should be applied before grasses are 1 inch tall and before corn is beyond the 4-leaf stage. Maximum rate is 2 lb/A Bladex 80W for postemergence application. Do not add crop oil or surfactant to postemergence applications. No carryover.
**BASAGRAN (BENTAZON)**

1½-2 pt Basagran

**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 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 ½ to ¾ pt/A can be tank-mixed with atrazine at 1 to 1½ pt of 4L or 1 to 2 lb of 80W or 1¼ to 2 lb of AAtrax Nine-O formulation per acre. Limited data. Do not mix with other herbicides. Do not treat corn under stress.

**BUCTRIL or ME4 BROMINAL (BROMOXYNIL)**

1-1½ pt Buctril or ½-1 pt ME4 Brominal

Contact herbicide. Very good to excellent control of several annual broadleaves including cocklebur, lambsquarters, wild buckwheat, and smartweed in SDSU tests. Excellent for sunflower. Weeds should be under 2 to 4 inches tall for best results. Pigweed and wild mustard are somewhat tolerant. Velvetleaf control is variable; plants must be under 3 to 4 inches. Control is reduced if plants are under drought stress. Not intended as a "rescue" treatment for large weeds. No soil residual effect. Gives topgrowth burn on Canada thistle. There is no translocation to underground parts of perennials. Bromoxynil does not cause brittleness or lodging. There is no vapor drift problem. Some crop leaf burn or scorch is frequently noted following application. Wet foliage and high temperatures at time of spraying increase the risk. Symptoms disappear as new growth develops.

ME4 Brominal can be tank-mixed with ¼ lb/A acid equiv 2,4-D to improve control of perennials or with 1 lb/A active atrazine for some residual effect and to improve control of pigweed and mustard. Good coverage is important. Minimum carrier is 20 gpa for Buctril and 10 gpa for ME4 Brominal. Do not apply in liquid fertilizer or use crop oil or surfactants.

**POSTEMERGENCE.** Corn should have at least 2 leaves before treating. Best time is 4- to 8-leaf stage. Buctril can be applied at 1 pt/A (¼ lb/A act) at the 2- to 8-leaf crop stage or at 1½ pt/A (3/8 lb/A act) at the 4- to 8-leaf crop stage. Drop nozzles are suggested if corn is over 8 inches. ME4 Brominal can be applied at ½ to 1 pt/A (¼-1½ lb act) at the 2-leaf to 14-inch crop stage. Maximum of 3/8 lb/A act suggested for most situations.

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

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

1½-2½ qt Lasso + ½ pt Sencor 4L or ½ lb Sencor 50W or ½ lb Sencor 75DF + 1¼-3 qt Bladex 4L or 1½-3 pt atrazine 4L

Three-way tank-mix. Excellent control of most annual grasses and several annual broadleaves. Very consistent control. Intended for improved broadleafed 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 at ½ pt + Bladex at 1½ 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 and 3 gpa for air.

**PREEMERGENCE.** Apply before crop emerges. Do not incorporate.

**TREFLAN (TRIFLURALIN)**

3¼-2 pt Treflan

**POSTEMERGENCE INCORPORATED.** Incorporated 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. Appears to have limited potential as a general weed program.
NO-TILL CORN

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.

BLADEX (Cyanazine)

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.

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 include:

- 3-4 lb Bladex 80W
- 2-3 lb Bladex 80W + 1-2 pt atrazine 4L or ¼-1¼ lb atrazine 80W

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 ½ of the grass herbicide with the Bladex/atrazine and the remaining ½ 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 1-½ 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.

PARAQUAT PLUS or GRAMOXONE (Paraquat)

1-2 pt Paraquat Plus or Gramoxone

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 1½ 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, 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 + 1¼-4 qt Bladex
1-2 pt paraquat + 2-2½ qt Lasso + ¾-2¼ qt Bladex
1-2 pt paraquat + 1½-2½ pt Dual + 1-2 qt Bladex
1-2 pt paraquat + 1¼-2½ pt Dual + 1¼-2 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 + 2½-3½ qt Lasso or 2-2½ pt Dual + ½-1 pt Banvel
ROUNDUP (GLYPHOSATE)

1-4 qt Roundup

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.)

<table>
<thead>
<tr>
<th>Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ½ qt Roundup + 1½-2½ pt Dual + 1¼-2 qt atrazine</td>
</tr>
<tr>
<td>1½ qt Roundup + 2.4-4 qt Bicep</td>
</tr>
<tr>
<td>1-1½ qt Roundup + 2-3 qt Lasso + 1-2 qt atrazine</td>
</tr>
<tr>
<td>1-1½ qt Roundup + 2-3 qt Lasso + 1-2¼ qt Bladex</td>
</tr>
<tr>
<td>1-1½ qt Roundup + 2½-3½ qt Lasso</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERICIANE</td>
<td>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.</td>
</tr>
<tr>
<td>SUTAN+</td>
<td>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.</td>
</tr>
<tr>
<td>LASSO or DUAL</td>
<td>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.</td>
</tr>
<tr>
<td>RAMROD</td>
<td>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.</td>
</tr>
</tbody>
</table>

WILD OATS

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERICIANE</td>
<td>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.</td>
</tr>
</tbody>
</table>
### WILD CANE, WILD PROSO MILLET

**ERADICANE EXTRA**  
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.

### SMALL-SEEDED ANNUAL BROADLEAVES (KOCHEA, RUSSIAN THISTLE, PIGWEED, LAMBQUARTERS)

**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 lb/A a.e. 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 1/2 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 1 1/2 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 a.e. 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 1/4 (dicamba) plus 1/8 to 1/4 (2,4-D amine) lb/A a.e. 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 4½ 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 3 qt/ A Roundup. No carryover or residual weed control. Plan to cultivate crop.

SPOT TREATMENT. Refer to Roundup section.

CANADA THISTLE, FIELD BINDWEEDE

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 a.e. 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. 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 a.e. 2,4-D amine. Follow precaution and directions in Banvel + 2,4-D section.

## YELLOW NUTSEDGE

### ERADICANE or SUTAN*
Preplant incorporated. Use 4½ 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.

AAtrax/ 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 + Bladex
Sutan + Bladex + atrazine
2,4-D

Herbicide Cost

The table below gives the cost per acre for several herbicide treatments using suggested retail prices. The cost listed is for the low and high rate. Prices vary according to location or quantity and frequently are somewhat less than shown. Consult your local dealer for actual prices.

<table>
<thead>
<tr>
<th>HERBICIDE</th>
<th>AMT / PRODUCT / A</th>
<th>COST / A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eradicane</td>
<td>3½ pt - 4¾ pt</td>
<td>$14.50-18.40</td>
</tr>
<tr>
<td>Eradicane + Bladex</td>
<td>3½-4¾ pt + 1½-2 qt</td>
<td>22.50-29.00</td>
</tr>
<tr>
<td>Eradicane + atrazine</td>
<td>3½-4¾ pt + 1-2 qt</td>
<td>17.00-23.50</td>
</tr>
<tr>
<td>&amp; Bladex + atrazine</td>
<td>1 pt + 1½ qt</td>
<td>20.00-25.50</td>
</tr>
<tr>
<td>Sutan + atrazine</td>
<td>3½-4¾ pt + 1½ qt</td>
<td>14.50-19.00</td>
</tr>
<tr>
<td>&amp; Bladex + Bladex</td>
<td>3½-4¾ pt + 1½ qt</td>
<td>20.00-25.50</td>
</tr>
<tr>
<td>Sutan + Bladex + atrazine</td>
<td>1½-2 qt</td>
<td>21.50-24.00</td>
</tr>
<tr>
<td>Sutan + Bladex + atrazine</td>
<td>1½-2 qt + 1 pt</td>
<td>14.50-19.00</td>
</tr>
<tr>
<td>&amp; Bladex + Bladex</td>
<td>2-2½ qt + 1½ qt</td>
<td>15.00-19.50</td>
</tr>
<tr>
<td>Lasso</td>
<td>3½-4¾ pt + 2½ qt</td>
<td>17.50-25.50</td>
</tr>
<tr>
<td>&amp; Bladex + atrazine</td>
<td>1½-2 qt + 1 pt</td>
<td>22.00-25.00</td>
</tr>
<tr>
<td>&amp; Bladex + Bladex</td>
<td>1½-2½ qt + 1½ qt</td>
<td>16.00-22.00</td>
</tr>
<tr>
<td>&amp; Bladex + Bladex</td>
<td>4-6 qt</td>
<td>17.00-25.00</td>
</tr>
<tr>
<td>&amp; Bladex + Bladex</td>
<td>2-4 qt</td>
<td>13.00-21.00</td>
</tr>
<tr>
<td>&amp; Bladex + atrazine</td>
<td>½ pt + 1¼ gal</td>
<td>4.70-7.00</td>
</tr>
<tr>
<td>&amp; Bladex + 2,4-D</td>
<td>½ pt + ¾ pt</td>
<td>4.00-4.25</td>
</tr>
<tr>
<td>&amp; atrazine + oil</td>
<td>½ pt + ¾ pt</td>
<td>5.80-8.70</td>
</tr>
<tr>
<td>&amp; 2,4-D</td>
<td>½-1 pt</td>
<td>5.80-11.60</td>
</tr>
<tr>
<td>&amp; Buctril</td>
<td>1-1½ pt</td>
<td>5.80-11.60</td>
</tr>
<tr>
<td>&amp; ME4 Brominal</td>
<td>½-1 pt</td>
<td>5.80-11.60</td>
</tr>
</tbody>
</table>