

100-673

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US ENVIRONMENTAL PROTECTION AGENCY OFFICE OF PESTICIDES PROGRAMS REGISTRATION DIVISION (75-767) WASHINGTON, DC 20460 NOTICE OF PESTICIDE: <input checked="" type="checkbox"/> REGISTRATION <input type="checkbox"/> REREISTRATION (Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended)	EPA REGISTRATION 100-673	DATE OF ISSUANCE MAY 4 1987
	TERM OF ISSUANCE Conditional	
	NAME OF PESTICIDE PRODUCT Dual Herbicide	

NAME AND ADDRESS OF REGISTRANT (Include ZIP code)

Ciba-Geigy Corporation
 Agricultural Division
 P.O. Box 18300
 Greensboro, NC 27419

NOTE: Changes in labeling formula differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above U.S. EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby Registered/Reregistered under the Federal Insecticide, Fungicide, and Rodenticide Act.

A copy of the labeling accepted in connection with this Registration/Reregistration is returned herewith.

Registration is in no way to be construed as an indorsement or approval of this product by this Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with FIFRA section 3(c)(7)(A) provided that you:

1. Submit/cite all data required for registration/reregistration of your product under FIFRA section 3(c)(5) when the Agency requires all registrants of similar products to submit such data.
2. Make the labeling changes listed below before you release the product for shipment:
 - a. Add the phrase "EPA Registration No. 100-673."
 - b. On page 15, the phytotoxicity statements in paragraph (1) and (2) should be reinstated in the Rotational Crops section. On page 16, delete the following sentences:

 All other rotational crops may be planted 16 months after application. All other rotational crops may be planted 11 months after 1 day application.
 - c. In the Pesticide Disposal section on page 68 the acutely toxic wording is not required since this product is in Toxicity Category III. Refer to section I.B.2 in the enclosed PR Notice #3-3.

ATTACHMENT IS APPLICABLE

BEST AVAILABLE COPY

SIGNATURE OF APPROVING OFFICIAL _____ DATE MAY 4 1987

88356: I: Mountfort: MF-11: KENCO: 4/30/87: 5/11/87: SONJA: VO: EK: kim

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- d. On pages 69 and 72 correct the signal word to CAUTION.
- e. Delete the Endangered Species section on page 70 and the referral statement on page 73. These statements are not required at this time.

3. Submit five (5) copies of your final printed labeling before you release the product for shipment. Refer to the A-79 enclosure for a further description of final printed labeling.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product constitutes acceptance of these conditions.

A stamped copy of the label is enclosed for your records.

Richard F. Mountfort *RFM*
Product Manager (23)
Fungicide-Herbicide Branch
Registration Division (TS-767C)

Enclosures

REPRODUCIBLE COPY

(Front Cover)

Dual®

Herbicide

For weed control in corn, cotton, nonbearing citrus, nonbearing grapes, peanuts, pod crops, potatoes, safflowers, grain or forage sorghum, soybeans, stone fruits, tree nuts and woody ornamentals

Active Ingredient:

Metolachlor: 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl) acetamide

86.4%

Inert Ingredients:

13.6%

Total:

100.0%

2 1/2 Gallons

U.S. Standard Measure

Dual contains 8 lbs. active ingredient per gallon

Keep Out of Reach of Children.

CAUTION

See additional precautionary statements inside booklet.

EPA Reg. No. 100-

Dual® trademark of CIBA-GEIGY for metolachlor
U.S. Patent No. 3,937,730

See directions for use inside booklet.

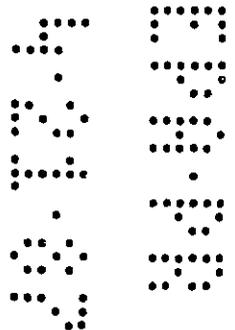
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Agricultural Division
CIBA-GEIGY Corporation
Greensboro, North Carolina 27419

CIBA-GEIGY

LABEL-D.3/DUAL/B/F1

AC
with comments
1987 PF
EPA Reg. No. 100-673



DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

IMPORTANT: Read the entire Directions for Use and the Conditions of Sale and Warranty before using this product.

Conditions of Sale and Warranty

The Directions for Use of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness, or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application all of which are beyond the control of CIBA-GEIGY or the Seller. All such risks shall be assumed by the Buyer. ✓

CIBA-GEIGY warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the Directions for Use subject to the inherent risks referred to above. CIBA-GEIGY makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty. In no case shall CIBA-GEIGY or the Seller be liable for consequential, special, or indirect damages resulting from the use or handling of this product.

CIBA-GEIGY and the Seller offer this product, and the Buyer and user accept it, subject to the foregoing Conditions of Sale and Warranty, which may be varied only by agreement in writing signed by a duly authorized representative of CIBA-GEIGY.

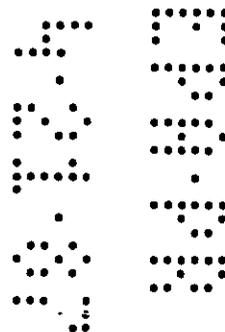


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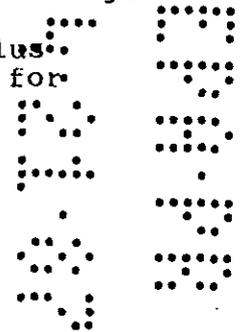
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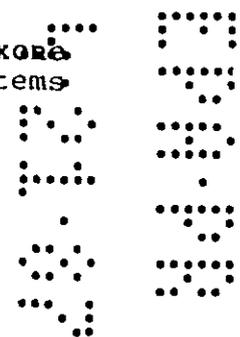
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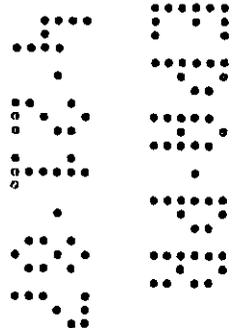
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DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

FAILURE TO FOLLOW THE DIRECTIONS FOR USE AND PRECAUTIONS ON THIS LABEL MAY RESULT IN POOR WEED CONTROL, CROP INJURY, OR ILLEGAL RESIDUES.

Do not apply this product in such a manner as to directly or through drift expose workers or other persons except those knowingly involved in the application. The area being treated must be vacated by unprotected persons.

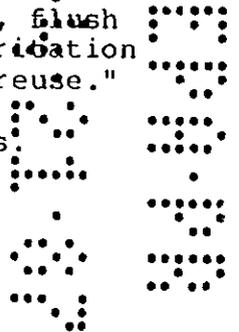
Reentry Statement

Do not enter treated areas without protective clothing until sprays have dried.

Because certain states may require more restrictive reentry intervals for various crops treated with this product, consult your State Department of Agriculture for further information.

Written or oral warnings must be given to workers who are expected to be in a treated area or in an area about to be treated with this product. Oral warnings must inform workers of areas or fields that may not be entered without specific protective clothing until sprays have dried, and appropriate actions to take in case of accidental exposure, as described under Precautionary Statements on this label. When oral warnings are given, warnings shall be given in a language customarily understood by workers. Oral warnings must be given if there is reason to believe that written warnings cannot be understood by workers. Written warnings must include the following information: "CAUTION. Area treated with Dual on (date of application). Do not enter without appropriate protective clothing until sprays have dried. In case of accidental exposure, flush eyes or skin with plenty of water. Call physician if irritation persists. Remove and wash contaminated clothing before reuse."

To avoid spray drift, do not apply under windy conditions. Avoid spray overlap, as crop injury may result.



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A. General Information

Observe all precautions and limitations on the labels of each product used in tank mixtures.

Dual is a selective herbicide recommended as a preplant surface-applied, preplant incorporated, or preemergence treatment in water or fluid fertilizer for control of most annual grasses and certain broadleaf weeds in nonbearing citrus, corn, cotton, nonbearing grapes, peanuts, pod crops, potatoes, safflowers, grain or forage sorghum, soybeans, stone fruits, tree nuts, and woody ornamentals.

Where directions specify a Dual tank mixture with AAtrex formulations, other brands of atrazine may be used. Follow the rates, recommendations, and limitations on the respective product label, if other brands of atrazine are used.

If Dual is incorporated, any supplemental tillage before planting must not exceed the specified depth of incorporation.

Dry weather following preemergence application of Dual or a tank mixture may reduce effectiveness. Cultivate if weeds develop.

Where reference is made to weeds partially controlled, partial control can either mean erratic control from good to poor, or consistent control at a level below that generally considered acceptable for commercial weed control.

Precaution: Injury may occur following the use of Dual under abnormally high soil moisture conditions during early development of the crop.

1. Soil Textures and Herbicide Rates

Where rates are based on coarse-, medium-, or fine-textured soils, it is understood that soil textural classes are generally categorized as follows:

<u>Coarse</u>	<u>Medium</u>	<u>Fine</u>
Sand	Loam	Silty clay loam
Loamy sand	Silt	Sandy clay loam
Sandy loam	Silt loam	Silty clay
		Sandy clay
		Clay loam
		Clay

Within rate ranges in the rate tables and elsewhere on this label, use the lower rate on soils relatively coarse-textured or low in organic matter; use the higher rate on soils relatively fine-textured or high in organic matter.

Note: Dual may be applied preemergence alone, or in combination with tank mix partners specified on this label, following pre-plant incorporated herbicides when used according to their label recommendations, provided that such use is not prohibited on the respective labels.

Thoroughly clean sprayer prior to use. Do not use a sprayer contaminated with any other materials, or crop damage or sprayer clogging may result.

2. Mixing Instructions

Dual Alone: Mix Dual with water or fluid fertilizer and apply as a spray. Fill the spray tank one-half to three-fourths full with water or fluid fertilizer, add the proper amount of Dual, then add the rest of the water or fluid fertilizer. Provide sufficient agitation during mixing and application to maintain a uniform emulsion.

-Tank Mixtures: Fill the spray tank one-fourth full with water, and start agitation; add AAtrex, Amiben, Balan, Banvel, Bladex, Caparol 4L, Dyanap, Eptam, Lexone, Lorox, Milogard, Premerge 3, Princep, AAtrex + Princep, Scepter, Sencor or Treflan, and allow it to become dispersed, then add Dual, then add paraquat (i.e., Gramoxone®) or Roundup if these products are being used, and finally the rest of the water. If Igran or Bladex is to be used in the tank mixture, first add a compatibility agent, such as Unite® or Compex®, at 2-3 pts./100 gals. of spray mixture. Then add Igran or Bladex and allow it to become dispersed. Then add Dual, and finally add the rest of the water. Agitate during

mixing and application to maintain a uniform suspension. For tank mixtures with AAtrex, Amiben, Banvel, Bladex, Caparol 4L, Eptam, Igran, Lexone, Lorox (but not Lorox L), Milogard, Princep, AAtrex + Princep, Sencor or Treflan, fluid fertilizers may replace all or part of the water as carrier, except in the AAtrex postemergence and the Banvel postemergence tank mixes. Do not apply tank mixtures of Dual + Dyanap, Dual + Lorox L, Dual + Premerge 3, or Dual + Scepter in fluid fertilizers. For tank mixtures with AAtrex, see additional mixing instructions on the AAtrex label. Check compatibility of mixture with fluid fertilizer, as described below, before mixing in spray tank. For tank mixtures with AAtrex or Princep plus Prowl, see the appropriate section of this label for mixing instructions.

Tank mixtures with Bladex should not be allowed to stand without agitation. If there is any evidence of incompatibility with Bladex in tank mixtures, add Compex, Unite, or an equivalent compatibility agent, to the mixture as with Igran or Bladex above. Check the compatibility of tank mixtures containing Bladex closely if fluid fertilizers are used as carriers. Empty the spray tank during the spraying operation.

Compatibility Test: Since liquid fertilizers can vary, even within the same analysis, always check compatibility with herbicide(s) each time before use. Be especially careful when using complete suspension or fluid fertilizers as serious compatibility problems are more likely to occur. Commercial application equipment may improve compatibility in some instances. The following test assumes a spray volume of 25 gals. per acre. For other spray volumes, make appropriate changes in the ingredients. Check compatibility using this procedure

1. Add 1 pint of fertilizer to each of 2 one-quart jars with tight lids.
2. To one of the jars add 1/4 tsp. or 1.2 milliliters of a compatibility agent approved for this use, such as Compex or Unite (1/4 tsp. is equivalent to 2 pts. per 100 gals. spray). Shake or stir gently to mix.
3. To both jars add the appropriate amount of herbicide(s). If more than one herbicide is used, add them separately with dry herbicides first, flowables next, and emulsifiable concentrates last. After each addition, shake or stir gently to thoroughly mix. The appropriate amount of herbicides for this test follows:

Dry herbicides: For each pound to be applied per acre, add 1.5 level teaspoons to each jar.

Liquid herbicides: For each pint to be applied per acre, add 0.5 teaspoon or 2.5 milliliters to each jar.

Note: For Dual tank mixtures with AAtrex + Princep, use $\frac{1}{3}$ - $\frac{1}{2}$ the amount of AAtrex specified above and the remainder as Princep, depending on whether the 1:2 or 1:1 ratio of AAtrex to Princep is to be applied.

- 4. After adding all ingredients, put lids on and tighten, and invert each jar ten times to mix. Let the mixtures stand 15 minutes and then look for separation, large flakes, precipitates, gels, heavy oily film on the jar, or other signs of incompatibility. Determine if the compatibility agent is needed in the spray mixture by comparing the two jars. If either mixture separates, but can be remixed readily, the mixture can be sprayed as long as good agitation is used. If the mixtures are incompatible, test the following methods of improving compatibility: (A) slurry the dry herbicide(s) in water before addition, or (B) add $\frac{1}{2}$ of the compatibility agent to the fertilizer and the other $\frac{1}{2}$ to the emulsifiable concentrate or flowable herbicide before addition to the mixture. If incompatibility is still observed, do not use the mixture.

3. Application Procedures

Application Timing

Dual alone or in some tank mixtures with other labeled herbicides may be applied for weed control in certain crops at various times. Refer to the given crop section of the label to determine if application timings listed below are recommended.

- 1. Preplant Surface Applied: For minimum-tillage or no-tillage systems only, Dual alone and some Dual tank mixtures may be applied up to 45 days before planting certain crops. Use only split applications for treatments made 30-45 days before planting, with $\frac{2}{3}$ the recommended broadcast rate for the crop and soil texture applied initially and the remaining $\frac{1}{3}$ at planting. Treatments less than 30 days before planting may be made either as a split or a single application. Refer to individual crop to determine if early preplant surface application is recommended. If weeds are present at the time of treatment, apply in a tank mixture combination with a contact herbicide (for example, paraquat or Roundup). Observe directions for use, precautions, and restrictions on the label of the contact herbicide. To the extent possible, do not move treated soil out of the row or move untreated soil to the surface during planting, or weed control will be diminished.

- 2. Preplant Incorporated: Apply Dual to the soil and incorporate into the top 2 inches of soil within 14 days before planting using a finishing disk, harrow, rolling cultivator, or similar implement capable of providing uniform 2 inch incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If crop will be planted on beds, apply and incorporate Dual after bed formation unless specified otherwise.
- 3. Preemergence: Apply Dual during planting (behind the planter) or after planting, but before weeds or crops emerge.

Special Application Procedures - California Only (Corn, Saf-flower, Pod Crops): Preplant Incorporated: Broadcast Dual to the soil and thoroughly incorporate with a disk or similar implement set to till 4-6" deep. For more thorough incorporation, till the soil in two different directions (cross-till). Crops may be planted on flat surface or on beds. Caution should be used when forming the beds that only soil from the Dual treated zone is used (i.e., untreated soil should not be brought to soil surface). If the application is made to preformed beds, incorporate Dual with a tillage implement set to till 2-4" deep. Care should be taken during tilling to keep the tilled (Dual treated) soil on the beds. Preemergence: Apply Dual after planting. Water with sprinkler or flood irrigation within 7-10 days.

Ground Application: Apply Dual alone or in tank mixtures by ground equipment in a minimum of 10 gals. of spray mixture per acre unless otherwise specified.

Use sprayers that provide accurate and uniform application. For Dual tank mixtures with wettable powder or dry flowable formulations, screens and strainers should be no finer than 50-mesh. Rinse sprayer thoroughly with clean water immediately after use.

Calculate the amount of herbicide needed for band treatment by the formula:

$$\frac{\text{band width in inches}}{\text{row width in inches}} \times \text{broadcast rate per acre} = \text{amount needed per acre of field}$$

Aerial Application: Apply Dual in water alone or in tank mixtures with AAtrex, Lorox, Lexone, or Sencor in a minimum total volume of 2 gals. per acre by aircraft. Avoid application under conditions where uniform coverage cannot be obtained or where excessive spray drift may occur. In order to assure that spray will be controllable within the target area when used according to label directions, make applications at a maximum height of 10 ft., using low drift nozzles at a maximum pressure of 40 psi, and restrict application to periods when wind speed does not exceed 10 mph. To assure that spray will not adversely affect adjacent sensitive nontarget plants, apply Dual alone or Dual + AAtrex by aircraft at a minimum upwind distance of 400 ft. from sensitive plants, or apply Dual + Lexone, Sencor, or Lorox at a minimum upwind distance of 300 ft. from sensitive plants.

Avoid application to humans or animals. Flagmen and loaders should avoid inhalation of spray mist and prolonged contact with skin and should wash thoroughly before eating and at the end of each day's operation. ✓

Center Pivot Irrigation Application: Dual alone or tank mixtures with AAtrex, or other herbicides on this label which are registered for center pivot application, may be applied in irrigation water preemergence (after planting but before weeds or crop emerge) at rates recommended on this label. Use only center pivot systems that apply water uniformly. Prepare a mixture with a minimum of 1 part of water to 1 part herbicide(s), and inject this mixture into the center pivot system using a positive displacement pump. Injecting a larger volume of a more dilute mixture per hour will usually provide more accurate calibration of metering equipment. Maintain sufficient agitation to keep the herbicide(s) in suspension. Apply in 1/2-1 inch of water. Use the lower water volume (1/2 inch) on coarser textured soils and the higher volume (1 inch) on finer textured soils. More than 1 inch of water at application may reduce weed control by moving the herbicide below the effective zone in the soil. Refer to supplemental literature published by CIBA-GEIGY for more information on calibration.

Precautions for center pivot applications: (1) Apply only through irrigation systems containing anti-syphon and check valves to prevent contamination of well during shutdown and overflow of solution tank. (2) Inject ahead of any right angle turn in the main line to insure adequate mixing. (3) Chemical injection pumps and water pumps must have interlocking controls to insure simultaneous shutoff. (4) Application when drift may

occur, such as from windy conditions, or when system joints and connections are leaking, or when nozzles are not providing uniform distribution, may cause crop injury. (5) Where sprinkler distribution patterns do not overlap sufficiently, unacceptable weed control may result. Where sprinkler distribution patterns overlap excessively, crop injury or illegal residues may result.

4. Dry Bulk Granular Fertilizers

Many dry bulk granular fertilizers may be impregnated or coated with Dual alone or selected Dual tank mixtures which are registered for preplant incorporated or preplant-surface application which are used to control weeds in crops on the Dual label and are not prohibited from use on dry bulk granular fertilizers.

When applying Dual or Dual mixtures with dry bulk granular fertilizers, follow all directions for use and precautions on the respective product labels regarding target crops, rates per acre, soil texture, application methods (including timing of application), and rotational crops.

All individual state regulations relating to dry bulk granular fertilizer blending, registration, labeling, and application are the responsibility of the individual and/or company selling the herbicide/fertilizer mixture. ✓

Prepare the granular herbicide/fertilizer mixtures by using any closed drum, belt, ribbon, or other commonly used dry bulk fertilizer blender. Nozzles used to spray Dual and Dual mixtures onto the fertilizer must be placed to provide uniform spray coverage.

If the herbicide/fertilizer mixture is too wet, use a highly absorptive powder, such as Microcel E (Johns-Manville Products Corporation), diatomaceous earth or finely powdered clay, to obtain a dry free-flowing mixture. Add the absorptive powder separately and uniformly to the herbicide/fertilizer mixture and blend to form a suitable free-flowing mixture. Generally, less than 2% by weight of absorptive powder will be needed.

Calculate amounts of Dual, AAtrex, AAtrex + Princep, Bladex, Igran, Milogard, Princep, Sencor or Lexone by the following formula:

$$\frac{2,000 \text{ lbs. of fertilizer per acre}}{\text{pts./acre of liquid or flowable product}} \times \text{pts. of liquid or flowable product per ton of fertilizer} = \text{lbs./acre of dry product}$$

$$\frac{2,000 \text{ lbs. of fertilizer per acre}}{\text{lbs./acre of dry product}} \times \text{lbs. of dry product per ton of fertilizer} = \text{pts. of liquid or flowable product per ton of fertilizer}$$

Precautions: To avoid potential for explosion, (1) Do not impregnate Dual or Dual mixtures on ammonium nitrate, potassium nitrate or sodium nitrate either alone or in blends with other fertilizers. (2) Do not combine mixtures of Dual plus any other herbicide with single superphosphate (0-20-0) or treble superphosphate (0-46-0). (3) Do not use Dual or Dual mixtures on straight limestone, since absorption will not be achieved. Fertilizer blends containing limestone can be impregnated.

Application

Apply 200-700 pounds of the herbicide/fertilizer mixture per acre. For best results, apply the mixture uniformly to the soil with properly calibrated equipment immediately after blending. Uniform application of the herbicide/fertilizer mixture is essential to prevent possible crop injury. Non-uniform application may also result in unsatisfactory weed control. In areas where conventional tillage is practiced, a shallow incorporation of the mixture into the soil may improve weed control. On fine or medium-textured soils in areas where soil incorporation is not planned, i.e., reduced tillage situations or in some conventional till situations, make applications approximately 30 days before planting to allow moisture to move the herbicide/fertilizer mixture into the soil. On coarse-textured soils, make applications approximately 14 days prior to planting.

Precaution: To avoid crop injury, do not use the herbicide/fertilizer mixture on crops where bedding occurs.

B. Dual Applied Alone

1. Weeds Controlled

- | | | |
|-------------------------------|------------------|-----------------------|
| barnyardgrass
(watergrass) | green foxtail | southwestern cupgrass |
| crabgrass | prairie cupgrass | witchgrass |
| crowfootgrass | red rice | yellow foxtail |
| fall panicum | signalgrass | yellow nutsedge |
| foxtail millet | (Brachiaria) | black nightshade |
| giant foxtail | | carpetweed |
| goosegrass | | Florida pusley |
| | | galinsoga |
| | | pigweed |

Weeds Partially Controlled*: common purslane, Florida beggarweed**, hairy nightshade, sandbur, seedling johnsongrass, shattercane, Texas panicum***, volunteer sorghum, wild proso millet.

*See General Information section. Control of these weeds can be erratic due partially to variable weather conditions. Control may be improved by following these suggested procedures:

1. Thoroughly till moist soil to destroy germinating and emerged weeds. If Dual is to be applied preplant incorporated, this tillage may be used to incorporate Dual if uniform 2 inch incorporation is achieved as recommended under Application Procedures.
2. Plant crop into moist soil immediately after tillage. If Dual is to be used preemergence, apply at planting or immediately after planting.
3. If available, sprinkler irrigate within 2 days after application. Apply 1/2-1 inch of water. Use lower water volume (1/2 inch) on coarse textured soils and higher volume (1 inch) on finer textured soils. Also, refer to the section on Center Pivot Irrigation Application for this method of applying Dual.
4. If irrigation is not possible and rain does not occur within 2 days after planting and application, weed control may be decreased. Under these conditions, a uniform, shallow cultivation is recommended as soon as weeds emerge.

**For partial control of this weed, use a minimum of 2 pts./A and apply preemergence.

***For partial control of this weed, use a minimum of 2 pts./A and apply through a center pivot irrigation system.

2. Rotational Crops: Crops other than beans (succulent and dry), fresh corn, grain corn, cotton, peanuts, peas (succulent and dry), chili peppers, potatoes, safflower, sorghum, soybeans, stone fruits, tree nuts and barley, buckwheat, millet, milo, oats, rice, rye, and wheat may not be planted in metolachlor-treated soil until 12 months after application.

*Should
resistate
1 & 2*

sorghum, pod crops, root crops, barley, buckwheat, milo, oats, rice, rye, or wheat may be planted in the spring following treatment. Do not graze or feed forage or fodder from cotton to livestock. ~~All other rotational crops may be planted 18 months after application.~~ (3) Following a layby treatment or multiple treatments applied the previous season, corn, cotton, soybeans, peanuts, potatoes, safflowers, sorghum, or the listed pod crops may be planted in the spring. ~~All other rotational crops may be planted 18 months after a layby application.~~

Note: For Rotational Crops restrictions for Dual used in tank mixtures, refer to the statements/restrictions above for Dual and to the respective product labels of any mixing partner(s) for additional statements/restrictions.

C. Citrus - Nonbearing - Dual Alone and Combinations

Citrus including grapefruits, lemons, limes, oranges, tangelos, citrus citron, kumquats and hybrids of these.

Broadcast 2-4 pts./A of Dual by ground equipment to weed-free soil in a minimum of 10 gals. of water to citrus to control weeds listed in the Dual Applied Alone section of this label. Apply the lower rates on coarse-textured soils with low organic matter and where the weed infestation is expected to be low. Apply the higher rates on fine-textured soils, soils high in organic matter, and where a heavy weed infestation is expected. Use caution when applying to keep the spray off the foliage to avoid possible foliar injury.

In the event weeds are present at the time of treatment, Dual may be applied in tank mix combination with Gramoxone or Roundup. Gramoxone may be applied at rates of 3-5 pts./A. Roundup may be applied at rates ranging from 1-5 qts./A, depending on the weed species. Refer to the Roundup label for the rate to be applied for various weed species. Direct applications containing Gramoxone or Roundup over the weeds, making certain to keep spray off foliage and stems of trees. Refer to the Gramoxone and Roundup labels for further directions, precautions and limitations relative to their use.

Precaution: Do not apply to trees transplanted in the grove less than 30 days and only after depressions around the trees have been filled in, or crop injury may occur.

Note: (1) Do not apply to trees that will bear harvestable fruit within 12 months of application, and (2) Do not graze livestock in treated areas or illegal residues may result.

D. Corn - Dual Alone

Apply Dual either preplant surface, preplant incorporated, or preemergence using the appropriate rate specified below.

Preplant Surface Applied: Refer to instructions for use of Dual alone under Application Procedures. Use on medium- and fine-textured soils with minimum-tillage or no-tillage systems in CO, IL, IN, IA, KS, KY, MN, MO, MT, NE, ND, SD, TN, WI, and WY. Apply 2/3 the recommended rate of Dual (2.5 pts./A on medium soils and 3 pts./A on fine soils) as a split treatment 30-45 days before planting and the remainder at planting. Applications made less than 30 days prior to planting may be as either a split or single treatment. Apply 2 pts./A on coarse soils not more than 2 weeks prior to planting.

On medium- and fine-textured soils with minimum- or no-tillage systems in DE, MD, MI, NY, OH, PA, VA, and WV, preplant surface applications may be applied following the directions for use above. If the amount of rainfall results in unsatisfactory length of weed control following the earlier treatment, a post-emergence application of an appropriately labeled broadleaf and/or grass weed herbicide may be used, i.e., AAtrex, Bicep 2,4-D, Banvel, Basagran® or bromoxynil (Brominal® or Bucril®). If the postemergence treatment includes the herbicide used preplant surface applied, do not exceed the total labeled rate for corn on a given soil texture. Observe all directions for use, precautions and limitations on the label of the postemergent herbicide.

Preplant Incorporated or Preemergence: Follow instructions for use of Dual alone under Application Procedures. On coarse soils, apply 1.5-2 pts./A of Dual if organic matter content is less than 3%, or 2 pts./A if organic matter content is 3% or greater. On medium soils, apply 2-2.5 pts./A of Dual. On fine soils, apply 2-2.5 pts./A of Dual if organic matter content is less than 3%, or 2.5-3 pts./A if organic matter content is 3% or greater.

To extend the duration of weed control in corn, a maximum rate of 3 pts./A of Dual may be applied after corn emergence until the corn plants reach 40 inches in height following any preplant surface-applied, preplant incorporated or preemergence herbicide

application including Dual. For best results, applications should be made to soil free of emerged weeds and directed towards the base of corn plants in excess of 5 inches tall. The total Dual rate applied on corn during any one crop year should not exceed 6 pts./A, depending on soil texture.

Shattercane and Wild Proso Millet - Partial Control: For more consistent partial control of shattercane or wild proso millet, apply 1.5-2 pts./A of Dual preplant incorporated followed by 1.5-2 pts./A of Dual preemergence. Make the preemergence application during or after planting, but before weeds and corn emerge. Apply the 2 pts./A rate of Dual when a heavy infestation of shattercane or wild proso millet is expected. A shallow cultivation may be needed following the preemergence application to control any late emerging shattercane or wild proso millet plants.

Notes: (1) Do not apply more than the labeled application rate for a given soil texture per year either as a single or split treatment or illegal residues may result. (2) In corn, Dual may be used up to 4 pts./A as either a preplant surface, preplant incorporated, or preemergence treatment on soils having an organic matter content between 6% and 20%. (3) In the event of escape of annual broadleaf weeds following a preplant surface, preplant incorporated, or preemergence treatment of Dual applied alone or in tank mix combination, follow with a postemergence application of an appropriately labeled broadleaf and/or grass weed herbicide, i.e., AAtrex, Basagran, Bicep, Brominal, Bucril, Banvel or 2,4-D. If the postemergence treatment includes the herbicide used in the earlier treatment, do not exceed the total labeled rate for corn on a given soil texture. (4) Brominal or Bucril may be applied postemergence alone or in tank-mix combination with AAtrex. Do not exceed 1.2 lbs. ai/A of AAtrex in tank-mix combination with Brominal or Bucril post-emergence. Refer to the Brominal, Bucril and AAtrex labels for specific rates and precautions. (5) Do not use Dual alone on peat or muck soils, or crop injury may occur. ✓

E. Corn - Dual Combinations

Dual alone or any tank mixture for corn (except Dual + AAtrex postemergence and Dual + Banvel postemergence) may be applied in water or fluid fertilizer. Use only water in the Dual + AAtrex or the Dual + Banvel postemergence tank mixes.

1. Tank Mixture with AAtrex or Princep, or AAtrex plus Princep - Preplant Surface, Preplant Incorporated, or Preemergence

In addition to the weeds controlled by Dual alone, Dual + AAtrex or Princep, or Dual + AAtrex + Princep, applied preplant surface, preplant incorporated or preemergence, also controls the following weeds: browntop panicum, cocklebur, common purslane, hairy nightshade, lambsquarters, morningglory, ragweed, smartweed, and velvetleaf.

Apply Dual + AAtrex or Princep, or Dual + AAtrex + Princep either preplant surface, preplant incorporated, or preemergence.

Preplant Surface Applied: Follow instructions for use of Dual alone under Application Procedures and under application instructions for Dual alone on corn. Apply Dual + AAtrex or Princep, or Dual + AAtrex + Princep on medium soils (2.5 pts./A Dual + 3.2-4 pts./A of AAtrex 4L or Princep 4L, or AAtrex 4L + Princep 4L combined) and on fine soils (2.5-3 pts./A Dual + 4-5 pts./A of AAtrex 4L or Princep 4L, or AAtrex 4L + Princep 4L combined in minimum-tillage and no-tillage systems in CO, IL, IN, IA, KS, KY, MN, MO, MT, NE, ND, SD, TN, WI, and WY. Apply the tank mixtures as a split or single treatment in those states and as indicated in the Dual alone Preplant Surface Applied section of the label for corn. On coarse soils, apply 2 pts./A of Dual and 3.2 pts./A of AAtrex 4L or Princep 4L, or AAtrex 4L + Princep 4L combined. ✓

Preplant Incorporated or Preemergence: Follow instructions for use of Dual alone under Application Procedures. Apply Dual + AAtrex or Princep, or Dual + AAtrex + Princep using the appropriate rates from Table 1.

Note: Do not apply more than the labeled rate for a given soil texture per year either as a split or single treatment, or illegal residues may result.

Shattercane and Wild Proso Millet - Partial Control:

For more consistent partial control of shattercane or wild proso millet where Dual is applied in tank mixture or sequentially with other registered corn herbicides, the following applications may be made:

1. Apply 1.5-2 pts./A of Dual plus 2 lbs. ai/A of AAtrex or Princep preplant incorporated followed by 1.5-2 pts./A of Dual preemergence. Make the preemergence application during or after planting, but before weeds and corn emerge.
2. Apply Dual at 2 pts./A alone or in tank mix combination with up to 2 lbs. ai/A of AAtrex, Bladex or Princep preplant incorporated followed by a post-directed application of Evik® 80W at 2.5 lbs./A. Do not exceed the total rate of triazine herbicide recommended for corn grown on a given soil texture. Refer to the Evik 80W label for specific directions for the post-directed application. ✓
3. Apply Eradicane® or Sutan® (or equivalent EPTC or butylate formulations) at labeled rates preplant incorporated followed by a preemergence application of Dual at 1.5-2 pts./A. Do not use Eradicane or Sutan on soils where rapid degradation has been shown to occur. Make the preemergence application during or after planting, but before weeds and corn emerge.
4. For partial control of wild proso millet only, apply Dual preemergence at 1.5-2 pts./A followed by a postemergence application of Prowl plus Bladex at labeled rates. Refer to the Prowl and Bladex labels for application instructions. Postemergence applications of Prowl and Bladex may cause corn injury.

Precaution: When following the application regimes in numbers 1-4 above, a shallow cultivation may be needed after the pre-emergence or postemergence application to help control any late emerging shattercane or wild proso millet plants.

Note: Do not exceed a total of 3 pts. ai/A of Dual in the preplant incorporated plus preemergence application on soils with less than 6% organic matter, or crop injury may occur.

Table 1: Dual + AAtrex or Princep, or Dual + AAtrex + Princep, Preplant Incorporation
Preemergence - Corn

Soil texture	Broadcast rates per acre			
	Less than 3% organic matter		3% organic matter	
	Dual + AAtrex Nine-O** OR Princep Caliber® 90*	Dual + AAtrex Nine-O** + Princep Caliber 90**	Dual + AAtrex Nine-O* OR Princep Caliber 90*	Dual + AAtrex Nine-O* OR Princep Caliber 90*
<u>COARSE</u>	1.25-1.5 pts. + 1.1-2.2 lbs.	1.25-1.5 pts. + .6-1.1 lbs. + .6-1.1 lbs.	1.5 pts. + 1.3-2.2 lbs.	
<u>MEDIUM</u>	1.5-2 pts. + 1.3-2.2 lbs.	1.5-2 pts. + .7-1.1 lbs. + .7-1.1 lbs.	2 pts. + 1.8-2.2 lbs.	
<u>FINE</u>	2 pts. + 1.8-2.2 lbs.	2 pts. + .9-1.1 lbs. + .9-1.1 lbs.	2-2.5 pts. + 1.8-2.2 lbs.***	
Muck or Peat (soils with more than 20% organic matter)	DO NOT USE			

to 3.5 pts./A in tank mix combination with 3.3 lbs./A of AAtrex Nine-0, or equivalent rates of AAtrex 80W or AAtrex 4L (4LC).

**When using the tank mixture of Dual + AAtrex Nine-0 + Princep Caliber 90, use equal rates of each as shown when heavy broadleaf weed infestations are expected. When heavy infestations of crabgrass or fall panicum are expected, use a 1:2 ratio of AAtrex + Princep instead of the 1:1 ratio given in Table 1 above. (Example: Total AAtrex Nine-0 + Princep Caliber 90 = 1.2 lbs./A, use 0.4 lb. of AAtrex plus 0.8 lb. of Princep, respectively.) Refer to the asterisk (*) above for AAtrex 4L, 4LC and 80W, and Princep 4L and 80W conversions.

***For cocklebur, yellow nutsedge, and velvetleaf control on fine-textured soils above 3% organic matter, apply 2.25 lbs./A of AAtrex Nine-0, or equivalent rates of AAtrex 4L, 4LC or 80W, or the same total amount of AAtrex + Princep with 2-2.5 pts./A of Dual.

2. Tank Mixture with AAtrex Postemergence

Weeds Controlled

barnyardgrass (watergrass)	<u>yellow foxtail</u> jimsonweed	prickly sida purslane
crabgrass	kochia	ragweed
crowfootgrass	lambsquarters	smartweed
fall panicum	mustard	velvetleaf
giant foxtail	pigweed	
green foxtail		

Weeds Partially Controlled: cocklebur, morningglory, yellow nutsedge.

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Apply to corn plants not more than 40 inches tall. Apply 1.5 pts./A of Dual + 1.3 lbs./A of AAtrex Nine-0* on coarse soils, 2 pts./A of Dual + 1.8 lbs./A of AAtrex Nine-0 on medium soils, or 2-2.5 pts./A of Dual + 1.8-2.2 lbs./A** of AAtrex Nine-0 on fine soils. Apply this tank mixture before grass and broadleaf weeds pass the 2-leaf stage and before corn exceeds 5 inches in height. Application to weeds larger than the 2-leaf stage will generally result in unsatisfactory control. Applications to corn in excess of 5 inches should be directed to the base of the corn plants; whereas applications to corn plants less than 5 inches tall may be made over the top. Occasionally some corn leaf burn may result, but this should not affect later growth or yield. Do not apply this postemergence tank mixture in fluid fertilizer, or severe crop injury may occur.

*When using AAtrex 4L, AAtrex 4LC, or AAtrex 80W, use equivalent rates. One lb. of Nine-0 equals 1.8 pts. of 4L (4LC) or 1.1 lb. 80W.

**For better control of cocklebur, morningglory, velvetleaf, and yellow nutsedge on fine-textured soils above 3% organic matter, apply 2.2 lbs./A of AAtrex Nine-0, or equivalent rate of AAtrex 80W or AAtrex 4L (4LC), with 2-2.5 pts./A of Dual.

Tank mixtures of Dual plus AAtrex may be applied following use of any registered preplant surface-applied, preplant incorporated or preemergence corn herbicide including Dual plus AAtrex.

Note: The total Dual rate should not exceed 6 pts., nor the AAtrex rate more than 4 lbs. active ingredient per acre during any one crop year, or illegal residues may result. Refer to the AAtrex label for geographic, soil-texture and rotational restrictions.

3. Tank Mixture with Bladex (Field Corn and Silage Corn Only)

In addition to the weeds controlled by Dual alone, Dual + Bladex, applied preplant incorporated or preemergence, also controls the following broadleaf weeds: jimsonweed, lambs-quarters, mustard, ragweed, smartweed, cocklebur*, morning-glory*, and velvetleaf*.

*Partially controlled.

Preplant Incorporated or Preemergence: Apply Dual + Bladex preplant incorporated or preemergence using the appropriate rate from Table 2. Follow instructions for use of Dual alone under Application Procedures.

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Table 2: Dual + Bladex - Field Corn and Silage Corn Only - Broadcast Rates Per Acre

Soil texture	Percent organic matter in soil			
	Less than 1%	1-2.5%	2.5-4%	Over 4%
	Pts. Dual + Qts. Bladex 4L*	Pts. Dual + Qts. Bladex 4L*	Pts. Dual + Qts. Bladex 4L*	Pts. Dual + Qts. Bladex 4L*
<u>COARSE</u> Sand, loamy sand	DO NOT USE	1.25-1.5 + .8-1.4	1.5-1.75 + 1.4-1.6	2 + 1.75
<u>COARSE</u> Sandy loam	1.25 + .8	1.25-1.5 + 1.2-1.4	1.5-1.75 + 1.4-1.75	2 + 2
<u>MEDIUM</u>	1.5 + 1.2	1.5-1.75 + 1.4-1.75	1.75-2 + 1.75-2	2.25 + 2.25
<u>FINE</u>	1.5 + 1.4	1.75-2 + 1.6-2	2-2.25 + 2-2.25	2.5 + 2.5
Muck or Peat soils (soils with more than 20% organic matter)	DO NOT USE			

*When using Bladex 80W or Bladex 90DF, use equivalent rates. One qt. of 4L equals 1.25 lbs. of 80W or 1.1 lbs. of Bladex 90DF.

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4. Tank Mixtures with AAtrex plus Bladex Formulations (Field Corn and Silage Corn Only)

Apply Dual + AAtrex + Bladex preplant incorporated or premergence to corn using the rates from Table 3. Refer to the AAtrex and Bladex labels, as well as the General Information section of this label, for all directions, precautions, and limitations.

Rotational Crops: Refer to the crop rotation statements for Dual alone on this label and for AAtrex and Bladex alone on those respective labels.

Table 3: Dual + AAtrex + Bladex - Field Corn
Broadcast Rate Preplant Incorporated or Preemergence

Soil texture	Percent organic matter in soil			
	Less than 1%	1-2.5%	2.5-4%	AA
	Pts. Dual + Lbs. AAtrex Nine-O* + Qts. Bladex 4L*	Pts. Dual + Lbs. AAtrex Nine-O* + Qts. Bladex 4L*	Pts. Dual + Lbs. AAtrex Nine-O* + Qts. Bladex 4L*	
<u>COARSE</u> Sand, loamy sand	DO NOT USE	1.25-1.5 + .4-1.1 + .6-1	1.5-1.75 + .5-1.3 + 1-1.2	
<u>COARSE</u> Sandy loam	1.25 + .5-1.1 + .6-1	1.25-1.5 + .7-1.3 + 1-1.2	1.5-1.75 + .9-1.8 + 1.2-1.6	
<u>MEDIUM</u> Loam, silt loam, silt	1.5 + .7-1.3 + 1-1.2	1.5-1.75 + .7-1.8 + 1.2-1.6	1.75-2 + .9-1.8 + 1.4-1.6	
<u>FINE</u> Sandy clay loam, silty clay loam, clay loam, sandy clay, silty clay	1.5 + .7-1.5 + 1.2-1.4	1.75-2 + .9-1.8 + 1.4-1.6	2-2.25 + .9-2 + 1.6-1.8	
Muck or Peat Soils (soils with more than 20% organic matter)	DO NOT USE			

to be the dominant weeds present.

Notes: (1) Refer to Dual, AAtrex, and Bladex labels for all directions, precautions, and limitations. (2) Continue to agitate the mixture and to empty the spray tank during the spraying operation. Should evidence of compatibility problems begin to occur in the tank mixture, add Unite or Compex compatibility agent at 2-3 pts./100 gals. of spray mixture. (3) Do not allow tank mixture to stand without continuous agitation. (4) Before using the tank mixture in fluid fertilizer, conduct a compatibility test using the fertilizer and herbicides.



5. Tank Mixture with Banvel

Preemergence: Use this tank mixture only on field corn which is flat-planted (no furrows) in IL, IN, IA, MN, NE, OH, SD, and WI.

In addition to the weeds controlled by Dual alone, Dual + Banvel, applied preemergence, also controls lambsquarters, ragweed, smartweed, cocklebur*, jimsonweed*, morningglory*, and velvetleaf*.

*Partially controlled.

Apply Dual + Banvel preemergence. Broadcast 1 pt./A of Banvel with 2 pts./A of Dual on medium soils, or with 2-2.5 pts./A of Dual on fine soils. Do not apply on coarse soils or on soils with less than 2.5% organic matter. Apply this tank mixture to the soil surface at planting or after planting but before corn emerges. Avoid drift to soybeans or other desirable plants. Do not apply with aircraft. Plant corn at least 1.5 inches deep and apply behind planting equipment avoiding incorporation by the planter wheel or other seed covering device. Do not incorporate before corn emergence. If it is necessary to rotary hoe to break the soil crust, do not disturb the soil more than one-half inch deep.

Postemergence for Control of Pigweed (Mid-Atlantic states including DE, MD, PA, VA, and WV): Apply 1.5-2.25 pts. of Dual plus 0.5-1 pt./A of Banvel or 1-2 pt./A of Banvel II by ground equipment when pigweed plants are less than 3 inches tall and before corn exceeds 5 inches in height in a minimum of 20 gallons of spray per acre. ✓

Use the lower rate on coarse-textured and low organic matter soils. Use the higher rate on fine-textured and high organic matter soils.

Precaution: Avoid drift to sensitive nontarget plants during application, or injury may occur.

6. Tank Mixture with AAtrex and Linuron for Control of Lambsquarters and Pigweed

For prolonged control of lambsquarters and pigweed in DE, MD, NJ, NY, PA, VA and WV, Dual may be applied preemergence in tank mix combination with AAtrex + linuron. Apply Dual and AAtrex according to the rates in Table 1 and linuron according to the rates below.

<u>Soil Texture</u>	<u>Broadcast Rate/A</u>
Sandy loam (1-3% organic matter)	.67 lb. linuron 50W*
Sandy loam (3-6% organic matter)	1.0 lb. linuron 50W*
Medium and fine-textured soils (1-6% organic matter)	1.0 lb. linuron 50W*

*When using linuron L (4 lbs. ai per gallon), use equivalent rates. One pt. of linuron L equals one lb. of linuron wettable powder.

Observe all directions for use, precautions and limitations on the Dual, AAtrex and linuron labels when applying these products in tank mix combinations.

7. Tank Mixture with AAtrex or Princep Plus Prowl® for Prolonged Control of Lambsquarters and Pigweed (Northeast U.S., including MI, IN, KY and States East of These)

For prolonged control of lambsquarters and pigweed, in addition to a broad spectrum of annual broadleaf and grass weeds, Dual in tank mix combination with AAtrex* or Princep plus Prowl 4E may be applied after planting but before corn or weeds emerge. Apply by ground equipment in a minimum of 10 gallons of water or 20 gallons of liquid fertilizer. Apply by air in a minimum of 5 gallons of water. Refer to Table 1 of this label for rates of Dual, AAtrex or Princep to be applied. Apply Prowl 4E according to the rates below in Table 4.

*Do not apply Dual in tank mix combination with AAtrex 80W plus Prowl, as this combination is not compatible. Other AAtrex formulations may be used.

Mixing Instructions: Fill the spray tank one-fourth full with water and start agitation. To aid in compatibility, add a compatibility agent, such as Unite® or X-77, at 4 pts./100 gals. of spray mixture to the spray tank first, then add the AAtrex or Princep and allow it to become dispersed, then add Dual and Prowl 4E, and finally the rest of the water.

Table 4. Prowl 4E - Broadcast Rates Per Acre

Soil texture	Percent Organic Matter in Soil		
	Less than 1.5%	1.5-3%	Over 3%
COARSE	1.5-2.0 pts.	2.0 pts.	3.0 pts.
MEDIUM	2.0 pts.	3.0 pts.	3.0 pts.
FINE	2.0 pts.	3.0 pts.	3.0 pts.

Observe all directions for use, precautions, and limitations on the respective product labels when applying these products in tank mix combination. Refer to the Prowl 4E label for replanting instructions in the event of crop loss.

8. Tank Mixture with AAtrex, Bladex, or Princep, AAtrex plus Bladex or AAtrex plus Princep, with Gramoxone or Roundup for Minimum-Tillage or No-Tillage Systems

In minimum-tillage or no-tillage systems where corn is planted directly into a cover crop, stale seedbed, established sod, or previous crop residues, the contact herbicides Gramoxone or Roundup may be added to a tank mix of Dual + AAtrex, Bladex or Princep, Dual + AAtrex + Bladex or Dual + AAtrex + Princep. When used as directed, the Gramoxone portion of the tank mixture controls most emerged annual weeds and suppresses many perennial weeds. Roundup combinations will control emerged annual and perennial weeds when applied as directed on the Roundup label. The Dual + AAtrex or Princep, or Dual + AAtrex + Princep portion of the tank mixture provides preemergence control of the weeds listed on this label in the tank mixture section for Dual + AAtrex or Princep, or Dual + AAtrex + Princep Preplant Surface, Preplant Incorporated, or Preemergence. The Dual + Bladex or Dual + AAtrex + Bladex tank mixture provides preemergence or postemergence control of weeds listed on this label in the tank mixture sections with AAtrex and Bladex.

Application: Apply before, during, or after planting, but before the corn emerges, at the rates specified below. Add Gramoxone or Roundup at the following broadcast rates:

Gramoxone: 1.5-2.5 pts./A plus 8 oz. of X-77 Spreader per 100 gals. of spray mixture. Use the lower rate for control of annual weeds less than 4 inches tall and the higher rate for weeds 4-6 inches tall. This treatment will not consistently control weeds taller than 6 inches.

Note: Do not apply combinations containing Gramoxone in suspension type liquid fertilizers as the activity of Gramoxone will be reduced.

Roundup: 1.5 qts./A for existing annual weeds, or 2-4 qts. per acre for existing perennial weeds. See the Roundup label for weeds controlled and recommended rates for specific weeds.

Apply in 20-60 gals. of water or fluid fertilizer per acre with ground equipment.

On coarse soils, apply 1.5 pts./A of Dual with 1.3 lbs. AAtrex Nine-O* or Princep Caliber 90*, or with 0.7 lb. Nine-O** plus 0.7 lb. Caliber 90**. On medium soils, apply 2 pts./A of Dual with 1.8 lbs. AAtrex Nine-O or Princep Caliber 90, or with 0.9 lb. Nine-O plus 0.9 lb. Caliber 90. On fine soils,*** apply 2-2.5 pts./A of Dual with 1.8-2.2 lbs. AAtrex Nine-O or Princep Caliber 90, or with 0.9-1.1 lbs. of Nine-O plus 0.9- 1.1 lbs. Caliber 90.

*When using AAtrex 4L (or Princep 4L), AAtrex 4LC, or AAtrex 80W (or Princep 80W), use equivalent rates. One lb. of Nine-O or Caliber 90 equals 1.8 pts. of 4L (4LC) or 1.1 lbs. of 80W. Use Princep in preference to AAtrex when heavy infestations of crabgrass or fall panicum are expected.

**When using the tank mixture of Dual + AAtrex Nine-O + Princep Caliber 90, use equal rates of AAtrex and Princep as shown when heavy broadleaf weed infestations are expected. When heavy infestations of crabgrass or fall panicum are expected, use a 1:2 ratio of AAtrex + Princep instead of the 1:1 ratio given above. (Example: Total AAtrex Nine-O + Princep Caliber 90 = 1.8 lbs./A, use 0.6 lb. of AAtrex plus 1.2 lbs. of Princep, respectively.) Refer to the asterisk (*) above for AAtrex 4L, 4LC and 80W, and Princep 4L and Princep 80W conversions. ✓

***For cocklebur, yellow nutsedge, and velvetleaf control on fine-textured soils above 3% organic matter, apply 2.25 lbs./A of AAtrex Nine-O, or equivalent rates of AAtrex 80W or AAtrex 4L (4LC), or the same total amount of AAtrex + Princep, with 2-2.5 pts./A of Dual.

9. Tank Mixture with AAtrex or AAtrex plus 2,4-D or AAtrex plus 2,4-D plus Banvel for Minimum-Tillage or No-Tillage Systems

In minimum-tillage or no-tillage systems where corn is planted directly into a cover crop, stale seedbed, established sod, or previous crop residues, Dual applied in combination with AAtrex will kill most emerged small annual weeds. Apply Dual + AAtrex before, during, or after planting, but before corn emerges according to the rates in Table 1.

Where heavy crop residues exist, add 0.8-1.6 pts./A of an appropriately labeled 3.8 lb. ai/gal. 2,4-D amine (such as Weedar 64, Weedar 64A, DMA-4 Herbicide, or Formula 40) to the spray tank last and apply in a minimum of 25 gals. of carrier/A.

As carriers, nitrogen solutions and complete liquid fertilizers, applied before corn emergence, enhance burndown of existing weeds, and therefore are recommended instead of water. Add X-77 surfactant at 1.0-2.0 qts/100 gals. of diluted spray, or another appropriate surfactant at its recommended rate. Apply before weeds exceed 3 inches in height. If alfalfa is present, add Banvel to the spray mixture at 0.33-0.5 pt./A and apply before alfalfa exceeds 6 inches in height.

For fields with existing sod grasses (e.g., bromegrass, orchardgrass, rye or timothy), when existing weeds exceed 3 inches in height or when very dry conditions exist, add Gramoxone at the rate of 2.5 pts./A in place of or in addition to 2,4-D as indicated above. Do not apply Gramoxone in suspension-type liquid fertilizer. Observe all directions for use, precautions and limitations on the respective product labels when applying these products in tank mix combination.



10. Tank Mixture with Bladex or Bladex plus AAtrex plus 2,4-D or Bladex plus AAtrex plus 2,4-D plus Banvel for Minimum-Tillage or No-Tillage Systems

In minimum-tillage or no-tillage systems where corn is planted directly into a cover crop, stale seedbed, established sod, or previous crop residues, Dual applied in combination with Bladex or Bladex + AAtrex will provide control of emerged small annual weeds, and extended control of those species on the Dual and Bladex labels.

Apply Dual in tank mix combination with Bladex according to the "Tank Mixtures with Bladex" and "Tank Mixtures with AAtrex..." sections of this label or the preemergence section of the Bladex and AAtrex labels. Where heavy corn residues exist at the time of treatment, follow directions for use in the "Bladex Plus Dual" tank mixture in the Minimum- or No-Till Weed Control section of the Bladex label. Using a minimum of 25 gals./A of carrier, add 0.8-1.6 pts./A of an appropriately labeled 3.8 lb. ai/gal. 2,4-D amine (such as Weedar 64, Weedar 64A, DMA-4 Herbicide, or Formula 40) to the spray tank last.

As carriers, nitrogen solutions and complete liquid fertilizers, applied before corn emergence, enhance burndown of existing weeds, and therefore are recommended instead of water. Add X-77 surfactant at 1.0 to 2.0 qts./100 gals. of diluted spray, or

another appropriate surfactant at its recommended rate. Apply before weeds exceed 3 inches in height. If alfalfa is present, add Banvel to the spray mixture at 0.33-0.5 p^t./A and apply before alfalfa exceeds 6 inches in height.

For fields with existing sod grasses (e.g., bromegrass, orchardgrass, rye or timothy), when existing weeds exceed 3 inches in height or when very dry conditions exist, add Gramoxone at the rate of 2.5 pts./A in place of or in addition to 2,4-D as indicated above. Do not apply Gramoxone in suspension-type liquid fertilizer. Observe all directions for use, precautions and limitations on the respective product labels when applying these products in tank mix combination.

F. Cotton - Dual Alone - AR, LA, MS, NM, OK, TN, TX, and
Bootheel of MO

Application: Apply Dual either preplant incorporated or preemergence at the rate of 1.5 pts./A on sandy loams*, 1.5-2 pts./A on medium soils, or 2 pts./A on fine soils. Do not use on sands and loamy sands.

*Use on sandy loam soils only in NM, OK, and TX.

Preplant Incorporated: Apply to the soil and incorporate into the top inch of soil immediately before planting, at planting, or after planting but before crop or weeds emerge. Use a rolling cultivator or similar implement to uniformly incorporate not more than one inch deep. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. Where furrow irrigation is used, wet the top of the bed for best results. If the crop is to be planted on beds, apply and incorporate after bed formation. Cotton should be planted below the zone of incorporation; i.e., at least 1 inch on fine soils and 1.5 inches on coarse and medium soils. If incorporated prior to planting, use a planter that will result in a minimum of soil disturbance.

Preemergence: Apply to the soil surface at planting, or after planting but before weeds or crop emerge.

Note: For best control of yellow nutsedge and suppression of seedling johnsongrass, apply Dual preplant incorporated at the maximum rate for the soil texture, whether applied alone or mixed with Caparol 4L.

Precautions: To avoid crop injury, (1) Do not apply Dual on sand or loamy sand soils or in areas where water is likely to "pond" over the bed; (2) Do not apply broadcast to furrow-planted cotton; and (3) Do not apply on Taloka silt loam.

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G. Cotton - Dual Combinations

1. Tank Mixture with Caparol 4L

Dual tank mixtures with Caparol 4L may be applied in water or fluid fertilizer. When fluid fertilizer is used as a carrier for Dual, either alone or in combination with Caparol 4L, mix only the amount that will be sprayed in one operation. These mixtures should not be allowed to stand without agitation. ✓

In addition to those weeds controlled by Dual alone, Dual + Caparol 4L, applied preplant incorporated or preemergence, also controls the following weeds: junglerice, wild oats, annual morningglory, groundcherry, hairy nightshade, lambsquarters, malva, mustard, prickly sida (teaweed), purslane, ragweed, and shallow-germinating seedlings of cocklebur and coffeeweed.

Preplant Incorporated or Preemergence: Apply Dual + Caparol 4L either preplant incorporated or preemergence using the appropriate rate from Table 5.

Table 5: Dual + Caparol 4L - Cotton (NM, OK, TX)

Use areas	Soil texture	Broadcast rates per acre	
		Dual	Caparol 4L
ALL	Sand, loamy sand	DO NOT USE	
Oklahoma, and Blacklands and Gulf Coast of Texas	loams	1.25-2 pts.	2.4 pts.
	clays	2 pts.	4.8 pts.
Rio Grande Valley of Texas	loams	1.25-2 pts.	3.2 pts.
	clays	2 pts.	4.8 pts.
New Mexico and High Plains, Rolling Plains, Edwards Plateau of Texas and Southwest Texas	sandy loam	1.25-1.5 pts.	1.6 pts.
	loams	1.25-2 pts.	2.4 pts.
	sandy clay loams	2 pts.	2.4 pts.
	other clay soils	2 pts.	3.2 pts.

Precautions: (1) To avoid concentration in the seed furrow, do not make broadcast applications of Dual + Caparol 4L to cotton planted in furrows more than two inches deep. Band applications may be made to cotton planted in furrows deeper than two inches, but band width should not exceed the width of the bottom of the furrow. To avoid crop injury, (2) Do not apply on sand or loamy sand soils, or in areas where water is likely to "pond" over the bed; (3) Do not apply in cut areas of newly leveled fields, or in areas of excess salt; (4) Do not apply to glandless cotton varieties; and (5) Do not apply on Taloka silt loam.

Note: Do not feed treated forage to livestock, or graze treated areas, or illegal residues may result.

Refer to the Caparol 4L label for further instructions and limitations.

H. Grapes - Nonbearing - Dual Alone and Combinations

Broadcast 2-4 pts./A of Dual by ground equipment to weed-free soil in a minimum of 10 gals. of water to grapes to control weeds listed in the Dual Applied Alone section of this label. Apply the lower rates on coarse-textured soils with low organic matter and where the weed infestation is expected to be low. Apply the higher rates on fine-textured soils, soils high in organic matter, and where a heavy weed infestation is expected. Use caution when applying to keep the spray off the foliage to avoid possible foliar injury.

In the event weeds are present at the time of treatment, Dual may be applied in tank mix combination with Gramoxone or Roundup. Gramoxone may be applied at rates of 3-5 pts./A. Roundup may be applied at rates ranging from 1-5 qts./A, depending on the weed species. Direct applications containing Gramoxone or Roundup over the weeds, making certain to keep spray off grape foliage and vines. Refer to the Gramoxone and Roundup labels for further directions, precautions and limitations relative to their use.

Precaution: Do not apply to vines established in the vineyard less than 30 days and only after depressions around the vines have been filled in, or crop injury may occur.

Note: Do not apply to vines that will bear harvestable fruit within 12 months of application, or illegal residues may result.

I. Peanuts - Dual Alone

Apply Dual either preplant incorporated, postplant incorporated, preemergence or layby using the appropriate rate specified below. Preplant Incorporated or Preemergence: Follow instructions for use of Dual alone under Application Procedures. Postplant Incorporated: Apply and shallowly incorporate Dual into the soil after planting, but before peanut germination. Incorporation depth and incorporating implements must be kept above the seed or seed will be damaged. Layby: Apply Dual to the soil immediately after the last normal cultivation.

Apply Dual alone preplant incorporated, postplant incorporated, preemergence or layby at a broadcast rate of 1.5-2 pts./A in the Southeast* and 1.25-2 pts./A in OK, TX, and NM.

*In the Southeast, use 2-3 pts./A and apply preemergence for partial control of Florida beggarweed. ✓

Note: Dual alone may be applied as directed after any of the following preplant incorporated herbicides when used according to their label recommendations: Balan at 3-4 qts./A; Treflan E.C. at 1 pt./A; or Vernam[®] at 2.33-3 pts./A.

J. Peanuts - Dual Combinations

1. Tank Mixture with Balan L.C.

Dual + Balan tank mixture applied preplant incorporated controls those weeds listed under Dual Applied Alone and those weeds as listed on the Balan label.

Apply 1.5-2 pts./A of Dual + 3-4 qts./A of Balan in a minimum of 10 gals. of spray volume per acre for ground application or in a minimum of 5 gals. of spray volume per acre for aerial application. Follow the recommended procedures for Balan on the Balan label for soil preparation and incorporation of this tank mix. Apply and incorporate Dual + Balan up to 14 days prior to planting.

Note: Follow all restrictions and precautions on the Balan label.

2. Multiple Applications (Southeast Only: AL, FL, GA, NC, SC or VA)

Where weed pressure is heavy or where species difficult to control are expected, Dual is most effective when used as follows:

1st Application: Apply Dual preplant incorporated, as directed under Peanuts-Dual Alone or apply Dual + Balan preplant incorporated as directed previously in this section. Refer to the respective section for weeds controlled.

2nd Application: Apply Dual any time from preemergence to "ground cracking" at 1.5-3 pts./A for extended control of weeds not yet emerged. Refer to the Dual Applied Alone section for a list of weeds controlled.

3rd Application: Apply Dual at layby as directed under Peanuts-Dual Alone. Use only when late germinating weeds are expected to be a problem. Refer to the Dual Applied Alone section for a list of weeds controlled.

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Notes: (1) Do not apply more than the equivalent of 6 pts. of Dual/A during any one year or illegal residues may result. This includes both Dual and Dual 25G (4 lbs. of Dual 25G equals 1 pt. of Dual). (2) Do not graze or feed peanut forage or fodder to livestock for 30 days following application and (3) Do not apply within 90 days of harvest, or illegal residues may result.

Rotational Crops: For a single application, refer to the rotational crop information under Dual Applied Alone. For multiple applications of Dual, corn, cotton, soybeans, peanuts, potatoes, safflowers, sorghum, or the pod crops listed on this label may be planted the spring following treatment. All other rotational crops may be planted 18 months after application.

K. Pod Crops - Dual Alone

Pod crops including: garbanzo, great northern beans, kidney beans, lima beans, mung beans, navy beans, peas (English*; southern peas, such as blackeye, pinkeye, crowder, etc.), pinto beans, and snap beans (green, wax, string). ✓

Apply Dual either preplant incorporated or preemergence using the appropriate rate specified below. Preplant Incorporated or Preemergence: Follow instructions for use of Dual alone under Application Procedures. On coarse soils with less than 3% organic matter, apply 1.5-2 pts./A of Dual or 2 pts./A if organic matter is 3% or greater. On medium soils, apply 2-2.5 pts./A of Dual. On fine soils, apply 2-2.5 pts./A of Dual if organic matter content is less than 3%, or 2.5-3 pts./A if organic matter content is 3% or greater.

*On English peas, use only preemergence applications. Do not use on English peas in northeastern U.S., or injury may occur.

Note: Do not cut for hay within 120 days following a Dual application, or illegal residues may result.

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L. Pod Crops - Dual Combinations

Note: When applying Dual in combination on pod crops, do not cut for hay within 120 days following application, or illegal residues may result.

1. Tank Mixture and Sequential Applications with Eptam - Beans (Green or Dry)

This mixture controls all weeds controlled by Dual alone and by Eptam alone. Refer to the Dual Applied Alone section of this label for weeds controlled by Dual alone and to the Eptam label for weeds controlled by Eptam.

Preplant Incorporated: Follow instructions for use of Dual alone under Application Procedures. Sequential: Apply Eptam alone Preplant Incorporated, as specified on that label. Follow with a preemergence application of Dual, at rates specified for Dual alone, during planting (behind the planter) or after planting, but before the weeds or crop emerge. ✓

Refer to the General Information section of this label and to the Eptam label for weather, cultural practices, and all other precautions and limitations that affect performance of these products.

Apply 3.5-4.5 pts./A of Eptam 7E* with Dual as specified. On coarse soils, apply 1.25 pts./A of Dual if organic matter content is less than 3%, or 1.5 pts./A if organic matter content is 3% or greater. On medium soils, apply 1.5 pts./A of Dual if organic matter content is less than 3%, or 2 pts./A if organic matter content is 3% or greater. On fine soils, apply 2 pts./A of Dual per acre if organic matter is less than 3%, or 2-2.5 pts./A if organic matter is 3% or greater.

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*Refer to the Eptam label for rate limits depending on geographical area, and for species and varietal restrictions.

Precaution: Do not exceed 3.5 pts./A Eptam 7E on small white beans or green beans grown on coarse-textured soils.

2. Tank Mixture and Sequential Applications with Premerge 3 - Beans (Field, Lima and Snap)

This mixture controls all weeds controlled by Dual alone and by Premerge 3 alone. Refer to the Dual Applied Alone section of this label for weeds controlled by Dual alone, and to the Premerge 3 label for weeds controlled by Premerge 3.

Note: Only water may be used as a carrier for Dual + Premerge 3 tank mixtures.

Preemergence: Using the appropriate rates as specified below, apply the tank mixture during planting (behind the planter) or after planting, but before weeds or crop emerge; or application may be delayed until just before or during early emergence when beans are in, but not beyond the "crook" stage. Sequential: Apply Dual preplant incorporated as specified for Dual alone. Follow with a preemergence or at emergence application of Premerge 3, or Dual may be applied preemergence as specified for Dual alone, followed by an at emergence application of Premerge 3 according to rates and instructions specified on that label. ✓

Refer to the General Information section of this label and to the Premerge 3 label for weather, cultural practices, and all other precautions and limitations that affect performance of these products.

Apply 1-1.5 gals./A of Premerge 3* with Dual as specified. On coarse soils, apply 1.25 pts./A of Dual if organic matter content is less than 3%, or 1.5 pts./A if organic matter content is 3% or greater. On medium soils, apply 1.5 pts./A of Dual if organic matter content is less than 3%, or 2 pts./A if organic matter content is 3% or greater. On fine soils, apply 2 pts./A of Dual if organic matter content is less than 3%, or 2-2.5 pts./A if organic matter content is 3% or greater.

*In the Premerge 3 rate range, use the high rate for preemergence application and the low rate for the at emergence application.

Precaution: Do not use on light sandy soils having little or no organic matter, or crop injury may result.

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Note: Do not graze or feed forage or fodder from pod crops treated with Dual + Premerge 3 to livestock for 6 weeks following treatment, or illegal residues may result.

3. Tank Mixture with Treflan - Beans (Dry - Kidney, Navy, Pinto, etc., Lima and Snap)

Dual + Treflan tank mix applied preplant incorporated controls those weeds listed under Dual Applied Alone and those weeds listed for Treflan alone on the Treflan E.C. label. Dual + Treflan E.C. may be applied by ground or aerial equipment and incorporated up to 14 days prior to planting. Follow the recommended procedures on this label and on the Treflan E.C. label using equipment that provides uniform 2 inch incorporation.

Apply Dual + Treflan tank mix using the appropriate Dual rate specified for Dual alone, and the Treflan rate from the Dry Beans, and the Lima and Snap Beans sections of the Treflan E.C. label. Choose the product rate for the specific soil texture/organic matter classification and weed species expected.

Note: Follow all restrictions and precautions on the Treflan E.C. label and on the Dual alone portion of this label. ✓

4. Tank Mixture with Amiben - Beans (White, Navy, Kidney, Pinto, and Lima)

Dual + Amiben tank mix applied either preplant incorporated or preemergence controls those weeds listed under Dual Applied Alone and those weeds listed for Amiben alone on the Amiben label.

Preplant Incorporated or Preemergence: Apply Dual and Amiben either preplant incorporated or preemergence using the Dual rate as specified for Dual alone, and the Amiben rate as specified on that label according to the soil texture/organic matter classification and weed species expected. Follow instructions for use of Dual alone under Application Procedures.

Refer to the General Information section of this label and to the Amiben label for weather and cultural practices that affect performance of these products.

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M. Potatoes - Dual Alone

Apply Dual either incorporated, preemergence, or after hilling/lay-by according to directions specified below for control of weeds listed under the General Information section. Within a rate range, use the lower rate on soils relatively coarse-textured or low in organic matter; use the higher rate on soils relatively fine-textured or high in organic matter. Effectiveness will be reduced if later cultural practices expose untreated soil.

Incorporated: Apply Dual at 1.5-3 pts./A to the soil and incorporate into the top 3 inches before planting using a finishing disk, harrow, rolling cultivator, or similar implement. Planting and later cultural practices should not bring untreated soil to the surface. Postplant incorporated application may be made any time after planting to drag-off, but before potato emergence. Use an implement that evenly distributes Dual in the top 2 inches of soil. Do not damage potato seed pieces or sprouts with incorporation equipment. ✓

Preemergence: Apply Dual at 1.5-3 pts./A either after planting as a preemergence, delayed preemergence, after drag-off or hilling treatment, but before weeds emerge. Up to 4 pts./A of Dual alone may be used where soil organic matter is between 6% and 20%.

After Hilling/Layby: Apply 2.5 pts./A Dual after hilling/at layby to control Dual-sensitive species for remainder of the growing season. This application will not control emerged weeds. It may be applied over a previous Dual application, but do not apply more than 5.5 pts./A of Dual in a single crop season.

Precaution: (1) Do not use on muck or peat soils. If cool, wet soil conditions occur after application, Dual may delay maturity and/or reduce yield of Superior and other early maturing potato varieties. To avoid crop injury, (2) Do not use on sweet potatoes or yams; (3) Do not apply both as a preemergence and an incorporated treatment; and (4) Do not use in Kern County, California.

Note: Potatoes treated with Dual should not be harvested within 60 days after the at planting to drag-off application, or within 40 days after a layby application, or illegal residues may result.

N. Potatoes - Dual Combinations1. Tank Mixture with Sencor or Lexone

In addition to those weeds controlled by Dual alone, Dual applied in tank mix combination with or sequentially with any of the registered Sencor or Lexone formulations, also controls the following broadleaf weeds: cocklebur*, hairy nightshade*, hemp sesbania, jimsonweed*, lambsquarters, prickly sida, ragweed, smartweed, velvetleaf, Venice mallow, and wild mustard.

*Partially controlled.

Dual at 1.5-3 pts./A plus the labeled Sencor/Lexone use rate may be used preemergence through after last hilling. Apply 1.5-2 pts./A of Dual on coarse soils and 2-3 pts./A on other soil textures. Within this rate range, use the lower rate on soils relatively coarse-textured or low in organic matter; use the higher rate on soils relatively fine-textured or high in organic matter. Effectiveness will be reduced if later cultural practices expose untreated soil. Dual will not control emerged weeds. ✓

Refer to the Sencor or Lexone labels for precautionary statements, restrictions, application information and weeds controlled.

Precautions: (1) Postemergence applications to potatoes should be made only as a directed or semi-directed spray to avoid chlorosis, minor necrosis or leaf distortion. To avoid crop injury, (2) Do not use Dual + Sencor or Lexone on potatoes in Kern County, California, and (3) Do not apply to sweet potatoes or yams. (4) Do not use this tank mixture on muck or peat soils.

Notes: (1) Potatoes treated with Dual in tank mixture with Sencor or Lexone cannot be harvested within 60 days after application or illegal residues may result. (2) Potatoes may not be harvested within 40 days after a lay-by application of Dual, or illegal residues may result.

2. Dual + Lorox Tank Mixture (East of Rocky Mountains)

Dual may be applied in a tank mix combination with any of the registered Lorox formulations as a preemergence broadcast application to potatoes. Apply to the soil surface after planting and before emergence of the crop or after final drag-off according to the rates specified in Table 6.

Table 6: Dual + Lorox - Potatoes (East of Rocky Mountains)

Soil texture	Broadcast rate per acre			
	1 to less than 3% organic matter		3 to 5% organic matter	
	Dual	Lorox*	Dual	Lorox*
<u>COARSE</u> Sandy loam	1.5 pts.	1-1.5 lbs.	2 pts.	1.5-2 lbs.
<u>MEDIUM</u> Loam, silt loam, silt	2 pts.	1.5-2 lbs.	2.5-3 pts.	2-2.5 lbs.

*When using Lorox L, use equivalent rates. One pt. of Lorox L equals one lb. of Lorox wettable powder.

Precautions: To avoid crop injury, (1) Do not use on sands or loamy sands, and (2) Do not incorporate or spray over the top of emerged potatoes, (3) Only water should be used as a carrier for Dual + Lorox L.

Refer to the General Information section of this label and to the Lorox label for precautionary statements, restrictions, application information and weeds controlled.

3. Tank Mixture with Premerge 3

Dual may be applied in a tank mix combination with Premerge 3 as a preemergence broadcast application 1 to 3 days before potatoes emerge. Apply 1.5-3 pts./A of Dual + 4-6 qts./A of Premerge 3.

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Precautions: (1) To avoid crop injury, do not use on light sandy soils with less than 1.0% organic matter. (2) Only water should be used as a carrier for Dual + Premerge 3.

Refer to the General Information section of this label and to the Premerge 3 label for precautionary statements, restrictions, application information and weeds controlled.

O. Safflowers - Dual Alone

Preplant Incorporated or Preemergence: Follow instructions for use of Dual alone under Application Procedures.

On coarse soils, apply 1.5-2 pts./A of Dual if organic matter content is less than 3%, or 2 pts./A if organic matter is 3% or greater. On medium soils, apply 2-2.5 pts./A of Dual. On fine soils, apply 2-2.5 pts./A of Dual if organic matter content is less than 3%, or 2.5-3 pts./A if organic matter content is 3% or greater.

P. Grain or Forage Sorghum (Seed treated with Concep) - Dual Alone

Apply Dual either preplant surface, preplant incorporated, or preemergence using the appropriate rate specified below.

Preplant Surface Applied: Refer to instructions for use of Dual under Application Procedures. For minimum-tillage or no-tillage systems only, Dual may be applied up to 45 days before planting in CO, IL, IA, KS, MO, NE, and SD. Use only split applications for treatments made 30-45 days prior to planting, with 2/3 of the broadcast rate applied initially and the remaining 1/3 at plant.ing. Apply 2.25 pts./A of Dual on medium soils or 2.5 pts./A on fine soils. Treatments less than 30 days prior to planting may be made either as a split or single application. Apply 2 pts./A of Dual on coarse soils not more than 2 weeks prior to planting.

Under dry conditions, irrigation after application is recommended to move Dual into the soil.

Preplant Incorporated or Preemergence: Refer to instructions for use of Dual under Application Procedures. Broadcast 1.5- 2 pts./A of Dual on coarse soils, 2-2.25 pts./A on medium soils, or 2-2.5 pts./A on fine soils.

Precautions: (1) If sorghum seed is not properly treated with Concep, Dual will severely injure the crop. (2) Under high soil moisture conditions prior to sorghum emergence, injury may occur following the use of Dual. The crop will normally outgrow this effect. (3) Do not use Dual on sorghum grown under dry mulch tillage or injury may occur. (4) Do not make more than one application per year, or illegal residues may result.

Q. Grain or Forage Sorghum (Seed treated with Concep) - Dual Combinations

Dual tank mixtures with AAtrex, Milogard, or Igran may be applied in water or fluid fertilizer. Apply Dual alone or in the tank mixtures only when the sorghum seed has been properly treated by the seed company with Concep.

Precautions: (1) Applications of Dual + AAtrex, Dual + Igran, or Dual + Milogard on highly alkaline soils or on eroded areas where calcareous subsoils are exposed may cause sorghum injury. (2) If sorghum seed is not properly treated with Concep, Dual + AAtrex, Dual + Igran, or Dual + Milogard may severely injure the crop. (3) Under high soil moisture conditions prior to sorghum emergence, injury may occur following the use of Dual + AAtrex, Dual + Igran, or Dual + Milogard. The crop will normally outgrow this effect. (4) Do not use Dual + AAtrex, Dual + Igran, or Dual + Milogard on sorghum grown under dry mulch tillage or injury may occur. (5) Do not make more than one application per year, or illegal residues may result.

i. Tank Mixture with AAtrex

In addition to the weeds controlled by Dual alone, Dual + AAtrex also controls the following broadleaf weeds when applied either preplant surface, preplant incorporated, or preemergence: cocklebur, common purslane, hairy nightshade, lambsquarters, morningglory, ragweed, smartweed, and velvetleaf.

Preplant Surface Applied: Refer to instructions for use of Dual under Application Procedures. For minimum-tillage or no-tillage systems only, Dual + AAtrex may be applied up to 45 days prior to planting in IL, IA, eastern KS, MO, NE and SD. Use only split applications for treatments made 30-45 days prior to planting, with 2/3 of the broadcast rate applied initially and the remaining 1/3 at planting. Apply 2.25 pts./A of Dual + 1.7-2 lbs./A of AAtrex Nine-0* on medium soils with 1.5% organic matter or greater. Apply 2.25 pts./A of Dual + 1.7-2 lbs./A of AAtrex Nine-0 on fine soils with less than 1.5% organic matter, or apply 2.5 pts./A of Dual + 2-2.2 lbs./A AAtrex Nine-0 on fine soils with 1.5% organic matter or greater. Treatments less than 30 days prior to planting may be made either as a split or single application. Under dry conditions, irrigation after application is recommended to move Dual + AAtrex into the soil.

Precautions: To avoid crop injury, 1) Do not use on coarse soils, and 2) Do not use on medium soils with less than 1.5% organic matter.

Preplant Incorporated or Preemergence: Refer to instructions for use of Dual under Application Procedures. On medium soils with 1.5% organic matter or greater, apply 1.5 pts./A of Dual + 1.3 lbs./A of AAtrex Nine-0*. On fine soils with less than 1.5% organic matter, apply 1.5 pts./A of Dual plus 1.3 lbs./A of AAtrex Nine-0; on fine soils with 1.5% organic matter or greater, apply 1.75-2 pts./A of Dual plus 1.6-1.8 lbs./A of AAtrex Nine-0.

*When using AAtrex 80W, AAtrex 4L, or AAtrex 4LC, use equivalent rates. One lb. of AAtrex Nine-0 equals 1.1 lb. of AAtrex 80W or 1.8 pts. of AAtrex 4L (4LC).

Precautions: To avoid crop injury, (1) Do not use on coarse soils; (2) Do not use on medium soils with less than 1.5% organic matter; (3) Do not use in NM, OK, or TX except in northeast OK and the Texas Gulf Coast and Blacklands areas; and (4) Do not apply preplant incorporated in AZ or the Imperial Valley of CA.

2. Tank Mixture with Igran (Grain Sorghum Only)

In addition to the weeds controlled by Dual alone, Dual + Igran also controls common purslane, hairy nightshade, kochia, lambsquarters, morningglory, puncturevine, ragweed, and velvetleaf. Dual + Igran may not give adequate control of foxtail millet and Florida pusley.

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Preplant Incorporated or Preemergence: Follow instructions for use of Dual alone under Application Procedures. On coarse soils*, apply 1.25 pts./A of Dual + 2.4 pts./A of Igran 4L**. On medium soils, apply 1.5-1.75 pts./A of Dual + 3.2-3.5 pts./A of Igran 4L. On fine soils, apply 1.75-2 pts./A of Dual + 3.5-4 pts./A of Igran 4L.

*On sandy loams, apply 1.25-1.5 pts./A of Dual + 2.4-3.2 pts./A of Igran 4L.

**When using Igran 80W, use equivalent rates. One pt. of Igran 4L equals 0.63 lb. of Igran 80W.

3. Tank Mixture with Milogard

In addition to the weeds controlled by Dual alone, Dual + Milogard applied either preplant surface, preplant incorporated, or preemergence also controls browntop panicum, common purslane, hairy nightshade, lambsquarters, and morningglory.

Preplant Surface Applied: Refer to instructions for use of Dual under Application Procedures. For minimum-tillage or no-tillage systems only, Dual + Milogard 4L* may be applied up to 45 days prior to planting in central and western KS and eastern CO. Use only split applications for treatments made 30-45 days prior to planting, with 2/3 of the broadcast rate applied initially and the remaining 1/3 at planting. On sandy loams, apply 2 pts./A of Dual + 1.2-1.6 pts./A of Milogard 4L. On medium soils, apply 2.25 pts./A of Dual + 1.6-2 pts./A of Milogard 4L. On fine soils, apply 2.5 pts./A of Dual + 2 pts./A of Milogard 4L. Treatments less than 30 days prior to planting may be made either as a split or single application. Under dry conditions, irrigation after application is recommended to move Dual + Milogard 4L into the soil.

Preplant Incorporated or Preemergence: Refer to instructions for use of Dual under Application Procedures. On sandy loams, apply 1.25-1.5 pts./A of Dual + 1.2-1.6 pts./A of Milogard 4L*. On medium soils, apply 1.5-1.9 pts./A of Dual + 1.6-2 pts./A of Milogard 4L. On fine soils, apply 1.9-2.1 pts./A of Dual + 2 pts./A of Milogard 4L.

*When using Milogard 80W or Milogard Maxx® 90, use equivalent rates. One pt. of Milogard 4L equals 0.56 lb. of Milogard Maxx 90 or 0.63 lb. of Milogard 80W.

Precautions: To avoid crop injury, (1) Do not apply on sands and loamy sands and (2) Do not incorporate on sandy loam soils in AR, GA, OK, NM, TX, and the Gulf Coast states.

4. Tank Mixture of Dual or Dual + AAtrex, with Paraquat or Roundup for Minimum-Tillage or No-Tillage Systems

In minimum-tillage or no-tillage systems where sorghum (seed treated with Concep) is planted directly into a cover crop, stale seedbed, established sod or previous crop residues, the contact herbicides Gramoxone or Roundup may be tank mixed with Dual or Dual + AAtrex. When used as directed, the Gramoxone portion of the tank mixture controls most emerged annual weeds and suppresses many perennial weeds. Roundup combinations will control emerged annual and perennial weeds when applied as directed on the Roundup label. The Dual or Dual + AAtrex portion of the tank mixture provides preemergence control of the weeds listed on this label under the respective sections.

Refer to the label of each product used in combination and observe the planting details, restrictions, and all other precautions and limitations.

Application: Apply before, during, or after planting but before sorghum emerges, at the appropriate rates listed under Grain or Forage Sorghum - Dual Alone or - Dual Combinations - Dual + AAtrex, respectively. Add Gramoxone or Roundup at the following broadcast rates:

Gramoxone: 1.5-2.5 pts. per acre plus 8 oz. or X-77 Spreader per 100 gals. of spray mixture. Use the lower rate for control of annual weeds less than 4 inches tall and the higher rate for weeds 4-6 inches tall. This treatment will not consistently control weeds taller than 6 inches.

Roundup: 1.5 qts. per acre for control of existing annual weeds, or 2-4 qts. per acre for existing perennial weeds. See the Roundup label for weeds controlled and recommended rates for specific weeds.

Apply in a minimum of 20 gals. of water per acre with conventional spray equipment.

R. Soybeans - Dual Alone

Apply Dual either preplant surface-applied, preplant incorporated or preemergence using the appropriate rate specified below. Preplant Surface-Applied, Preplant Incorporated or Preemergence: Follow instructions for use of Dual alone under Application Procedures.

Preplant Surface Applied: Use on medium and fine soils with minimum-tillage or no-tillage systems in CO, IL, IN, IA, KS, KY, MN, MO, MT, NE, ND, SD, TN, WI, and WY. Apply 2/3 the recommended rate of Dual (2.5 pts./A on medium soils and 3 pts./A on fine soils) as a split treatment 30-45 days prior to planting and the remainder at planting. Applications made less than 30 days before planting may be as either a split or single treatment. Apply 2 pts./A on coarse soils not more than 2 weeks prior to planting.

Preplant Incorporated or Preemergence: On coarse soils, apply 1.5-2 pts./A of Dual if organic matter content is less than 3%, or 2 pts./A if organic matter content is 3% or greater. On medium soils, apply 2-2.5 pts./A of Dual. On fine soils, apply 2-2.5 pts./A of Dual if organic matter content is less than 3%, or 2.5-3 pts./A if organic matter content is 3% or greater.

Note: On soybeans, Dual may be used up to 4 pts./A as a preplant surface-applied, preplant incorporated or preemergence treatment on soils having an organic matter content between 6% and 20%. The total Dual rate applied to soybeans during any one crop should not exceed 4 pts./A.

S. Soybeans - Dual Combinations

Water or fluid fertilizer may be used as carrier for Dual in combination with Amiben, Sencor, Lexone, or Lorox 50W. Only water may be used as carrier for Dual + Dyanap, Dual + Lorox L, Dual + Premerge 3, or Dual + Scepter.

Note: For all of the following combinations, Dual may be used up to 3.5 pts./A on soils having an organic matter content between 6% and 20%. The total Dual rate applied to soybeans during any one crop year should not exceed 4 pts./A.

1. Tank Mixture with Sencor or Lexone

In addition to those weeds controlled by Dual alone, Dual + Sencor or Lexone, when applied as directed, also controls the following broadleaf weeds: cocklebur*, hairy nightshade, hemp sesbania, jimsonweed*, lambsquarters, prickly sida, ragweed, smartweed, velvetleaf, Venice mallow, and wild mustard.

*Partially controlled.

Apply Dual and Sencor or Lexone preplant incorporated or preemergence using the appropriate rates from Table 7. Preplant Incorporated or Preemergence: Follow instructions for use of Dual alone under Application Procedures. Sequential: Apply Dual alone Preplant Incorporated, as specified in Table 7 for this tank mixture. Follow with a preemergence application of Sencor or Lexone during planting (behind the planter) or after planting before weeds or soybeans emerge.

Refer to the Sencor or Lexone labels for planting details and soybean variety restrictions.

Table 7: Dual + Sencor or Lexone - Soybeans

Soil texture**	Broadcast rates per acre			
	0.5% to less than 3% organic matter		3% organic matter or greater	
	Dual	Sencor 50WP* or + Lexone	Dual	Sencor 50WP* or + Lexone
<u>COARSE</u> Loamy sand (over 2% organic matter), sandy loam	1.25-1.5 pts.	+ .5 lb.	1.5 pts.	+ .75 lb.
<u>MEDIUM</u>	1.5-2 pts.	+ .75 lb.	2 pts.	+ 1 lb.***
<u>FINE</u>	2 pts.	+ 1 lb.	2-2.5 pts.	+ 1 lb.
<u>Mississippi Delta only</u> Silty clay, clay	2 pts.	+ 1.5 lbs.	2-2.5 pts.	+ 1.5 lbs.
Muck or Peat soils (soils with more than 20% organic matter)	DO NOT USE			

*When using Sencor 4 or Lexone 4L, substitute pints for pounds (1 pint equals 1 pound). For Sencor DF or Lexone DF, multiply pounds 50WP by 0.67.

**On all sand and on loamy sand with less than 2% organic matter, do not use this tank mixture preemergence, or the sequential treatment. Do not use the tank mixture preplant incorporated on any sand, loamy sand, or sandy loam, or crop injury may occur.

***Use 0.75 lb./A if applied preplant incorporated.

Precautions: (1) Do not use the tank mix or sequential application on soil with less than 0.5% organic matter or on alkaline soil with a pH over 7.4, or crop injury may occur. (2) If heavy rain occurs soon after application, crop injury may result, especially in poorly drained areas where water stands for several days.

2. Tank Mixture with Lorox

In addition to those weeds controlled by Dual alone, Dual + Lorox, applied preemergence, also controls the following broadleaf weeds: cocklebur*, jimsonweed*, lambsquarters, morningglory*, prickly sida, ragweed, smartweed, velvetleaf*, Venice mallow, and wild mustard.

*Partially controlled.

Preemergence: Apply during planting (behind planter) or after planting, but before weeds or soybeans emerge. Refer to the Lorox label for planting details. Apply the appropriate rates from Table 8.

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Table 8: Dual + Lorox - Soybeans

	Broadcast rates per acre	
	0.5% to less than 3% organic matter	3% organic matter or greater
Soil texture*	Dual + Lorox***	Dual + Lorox***
<u>COARSE**</u>	1.25 pts. + 1 lb.	1.5 pts. + 1-1.5 lbs.
<u>MEDIUM</u>	1.5 pts. + 1-1.5 lbs.	2 pts. + 1.5-2 lbs.
<u>FINE</u>	2 pts. + 2 lbs.	2-2.5 pts. + 2.5-3 lbs.
Muck or Peat soils (soils with more than 20% organic matter)	DO NOT USE	

*Do not use on sand, gravelly soils, or exposed subsoils.
 **Do not use on loamy sand, except in the northeastern U.S. on loamy sand with over 1% organic matter.
 ***When using Lorox L, use equivalent rates. One pt. of Lorox L equals one lb. of Lorox wettable powder.

Precautions: (1) Do not use on soil with less than 0.5% organic matter or crop injury may occur. (2) Only water should be used as a carrier for Dual + Lorox L.

3. Tank Mixture with Dyanap

In addition to those weeds controlled by Dual alone, Dual + Dyanap, when applied as directed, also controls the following broadleaf weeds: cocklebur*, jimsonweed, lambsquarters, morningglory*, prickly sida, purslane, ragweed, smartweed, and wild mustard.

*Cocklebur and morningglory controlled with crook stage application only.

Apply Dual + Dyanap in 20-40 gals. of spray mixture per acre during the interval preemergence during planting (behind the planter) through crook stage (from soil cracking to before the soybean true leaves open) according to the rates specified below. Do not apply this tank mixture in fluid fertilizer.

On coarse soils, apply 1.25 pts./A of Dual plus 4.5 qts./A of Dyanap if organic matter content is less than 3%, or apply 1.5 pts./A of Dual + 4.5 qts./A of Dyanap if organic matter content is 3% or greater. On medium soils, apply 1.5 pts./A of Dual + 6 qts./A of Dyanap if organic matter content is less than 3%, or apply 2 pts./A of Dual + 6 qts./A of Dyanap if organic matter content is 3% or greater. On fine soils, apply 2 pts./A of Dual + 6 qts./A of Dyanap if organic matter content is less than 3%, or apply 2-2.5 pts./A of Dual + 6 qts./A of Dyanap if organic matter content is 3% or greater.

If 1/2-1 inch of rainfall does not occur within 7 days after application, shallow incorporation (1/2-1 inch) is recommended. Cultivate if weeds develop. Refer to the Dyanap label for planting and other product use information.

4. Tank Mixture with Amiben -

This tank mixture controls all weeds controlled by Dual alone and by Amiben alone. Refer to the Dual Applied Alone section of this label for weeds controlled by Dual alone and to the Amiben label for weeds controlled by Amiben.

Preplant Incorporated or Preemergence: Apply 1 gal./A of Amiben plus either 1.5 pts./A of Dual on coarse soils, 1.5-2 pts./A of Dual on medium soils, or 2-2.5 pts./A of Dual on fine soils. Use 1.5 gals. of Amiben/A on fine-textured high organic matter soils or where a dense stand of difficult to control broadleaf weeds, such as black nightshade, velvetleaf, or wild mustard is expected to occur. Preplant Incorporated: Apply the tank mixture to the soil and incorporate into the top 2 inches of soil just before planting. Follow instructions for use, other than the preplant interval, of Dual alone under Application Procedures. Preemergence: Apply the tank mixture during planting (behind the planter) or after planting before weeds or soybeans emerge. Sequential: Apply Dual alone Preplant Incorporated, as specified above for this tank mixture. Follow with a preemergence application of Amiben during planting (behind the planter) or after planting before weeds or soybeans emerge.

Refer to the General Information section of this label and to the Amiben label for weather and cultural practices that affect performance of these products.

5. Tank Mixture and Sequential Application with Premerge 3

This mixture controls those weeds controlled by Dual alone and by Premerge 3 alone. Refer to the Dual Applied Alone section of this label for weeds controlled by Dual alone and to the Premerge 3 label for weeds controlled by Premerge 3.

Preemergence: Using the appropriate rates specified below, apply the tank mixture during planting (behind the planter) or after planting, but before weeds or crop emerge; or application may be delayed to ground cracking. Sequential: Apply Dual preplant incorporated as specified for Dual alone. Follow with a preemergence or ground crack application of Premerge 3; or Dual may be applied preemergence as specified for Dual alone followed by a ground crack application of Premerge 3. At Emergence (when soybeans are emerging and are still in the cotyledon stage before leaves open to expose the terminal bud): To control small emerged weeds, use the Dual rate specified for Dual alone plus 2-3 qts./A of Premerge 3.

Precaution: Do not apply this tank mix in fluid fertil er.

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On coarse soils, apply 1.5 pts./A of Dual + 4 qts./A of Premerge 3. On medium soils, apply 1.5 pts./A of Dual + 6 qts./A of Premerge 3 if organic matter content is less than 3%, or apply 2 pts./A of Dual + 6 qts./A of Premerge 3 if organic matter content is 3% or greater. On fine soils, apply 2 pts./A of Dual + 6 qts./A of Premerge 3 if organic matter content is less than 3%, or apply 2-2.5 pts./A of Dual + 6 qts./A of Premerge 3 if organic matter content is 3% or greater.

Refer to the Premerge 3 label for weather, temperature, cultural practices, and all other precautions and limitations that affect performance and crop tolerance of this product.

Precaution: Do not use on light sandy soils having little or no organic matter, or crop injury may occur.



6. Tank Mixture with Amiben and Sencor or Lexone

This tank mixture effectively controls those weeds as listed on the current Dual, Amiben, and Lexone WP/4L/DF or Sencor WP/4/DF labels.

Apply Dual + Amiben + Lexone or Sencor preplant incorporated or preemergence using the appropriate rates from Table 9. Preplant Incorporated or Preemergence: Follow instructions for use of Dual alone under Application Procedures.

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Table 9: Dual + Amiben + Sencor or Lexone - Soybeans

Soil texture	Broadcast rates per acre*		
	Dual	+ Amiben	+ Sencor 50WP** or Lexone
<u>COARSE</u> Loamy sand (over 2% organic matter), sandy loam	1.5-2 pts.	+ 3-4 qts.	+ .5 lb.
<u>MEDIUM</u>	2-2.5 pts.	+ 4-5 qts.	+ .5-.75 lb.***
<u>FINE</u>	2.5-3 pts.	+ 5-6 qts.	+ .75-1 lb.***
Muck or Peat soils (soils with more than 20% organic matter)	DO NOT USE		



*Refer to the Amiben + Dual + Sencor/Lexone section of the Amiben label for determining product use rate within rate ranges.

**When using Sencor 4 or Lexone 4L, substitute pints for pounds (1 pint equals 1 pound). For Sencor DF or Lexone DF, multiply pounds 50WP by 0.67.

***On Clarion-Webster or similar alkaline (calcareous) soils with a pH of 7.5 or above, apply the WP at 0.5 lb./A on medium soils and 0.5-0.75 lb./A on fine soils.

Special Precautions: Refer to the Dual + Sencor/Lexone section of this label, the Amiben + Dual + Sencor/Lexone section of the Amiben label and the Sencor/Lexone labels for planting details, variety limitations, and all cautions and restrictions concerning use of these products on soybeans.

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7. Tank Mixture with Treflan

Dual + Treflan tank mix applied preplant incorporated controls those weeds listed under Dual Applied Alone and those weeds listed for Treflan alone on the Treflan E.C. label. Dual + Treflan may be applied by ground or aerial equipment and incorporated up to 14 days prior to planting. Follow the recommended procedures on the Treflan E.C. and Dual labels using equipment that provides uniform 2 inch incorporation.

Apply Dual + Treflan tank mix using the appropriate rate from the Dual alone section of this label and the Treflan alone section of the Treflan E.C. label for the specific soil texture/organic matter classification and weed species expected.

Note: Follow all restrictions and precautions on the Treflan E.C. label and on the Dual alone portion of this label.

8. Tank Mixture with Scepter

This tank mixture controls all weeds controlled by Dual alone and by Scepter alone. Refer to the Dual Applied Alone section for weeds controlled by Dual and to the Scepter label for weeds controlled by Scepter. Refer to the Scepter label for geographical locations where this tank mixture may be applied. ✓

Apply Dual + Scepter preplant incorporated or preemergence using rates in the table below. Follow use directions under Application Instructions on the Scepter label. For preplant incorporated applications apply and incorporate within 30 days before planting. Observe all other precautions and limitations on the Scepter labels.

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Table 10: Dual + Scepter-Soybeans

	Broadcast Rates Per Acre			
	Less Than 3% Organic Matter		3% or More Organic Matter	
Soil Texture	Dual	Scepter	Dual	Scepter
Coarse	1.25 pts.	.67 pt.	1.5 pts.	.67 pt.
Medium	1.5 pts.	.67 pt.	2.0 pts.	.67 pt.
Fine	2.0 pts.	.67 pt.	2-2.5* pts.	.67 pt.
Muck or Peat Soils (soils with more than 20% organic matter)	DO NOT USE			



*Use the higher rate of Dual if heavy weed infestations are expected.

Note: (1) Do not apply within 90 days of harvest, and (2) Do not graze or feed treated soybean forage, hay or straw to live-stock, or illegal residues may result.

9. Tank Mixture with Lexone, Sencor, Scepter or Lorox plus Gramoxone or Roundup for Minimum-Tillage or No-Tillage Systems

In minimum-tillage or no-tillage systems where soybeans are planted directly into a cover crop, stale seedbed, established sod, or previous crop residues, the contact herbicides Gramoxone or Roundup may be added to a tank mix of either Dual + Sencor or Lexone, Dual + Scepter or Dual + Lorox. When used as directed, the Gramoxone portion of the tank mixture controls most emerged weeds and suppresses many perennial weeds. Roundup combinations will control emerged annual and perennial weeds when applied as directed on the Roundup label. The Dual + Sencor/Lexone, Scepter or Lorox portion of the tank mixture provides preemergence control of the weeds listed on this label in the tank mixture section for Dual + Sencor/Lexone, Dual + Scepter or Dual + Lorox, respectively.

Refer to the label of each product used in combination and observe the planting details, soybean variety restrictions, geographical restrictions and all other precautions and limitations. ✓

Refer below for rates of Dual + Sencor/Lexone, Dual + Scepter or Dual + Lorox, respectively.

Refer to the section for tank mixtures with AAtrex or Princep, or AAtrex plus Princep with Gramoxone or Roundup on corn for rates of Gramoxone or Roundup, for volume of water, and other instructions and limitations.

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Dual + Lexone/Sencor + Gramoxone or Roundup

On loamy sand with over 2% organic matter, apply 1.5 pts./A of Dual + 0.5-0.75 lb./A of Sencor 50WP* or Lexone. On medium soils, apply 2 pts./A Dual + 0.75-1 lb./A of Sencor 50WP or Lexone. On fine soils, apply 2-2.5 pts./A of Dual + 1 lb./A of Sencor 50WP or Lexone.

*When using Sencor 4 or Lexone 4L, substitute pints for pounds (1 pint equals 1 pound). For Sencor DF or Lexone DF, multiply pounds 50W by 0.67.

Precautions: To avoid crop injury, (1) Do not use this tank mixture on soil with less than 0.5% organic matter, on alkaline soil with a pH over 7.4, or on all sand and on loamy sand with less than 2% organic matter. (2) If heavy rain occurs soon after application, crop injury may result, especially in poorly drained areas where water stands for several days or where the seeding slit has not been properly closed.

Dual + Scepter + Gramoxone or Roundup

On coarse soils, apply 1.5 pts./A of Dual + .67 pt./A of Scepter. On medium soils, apply 2 pts./A of Dual + .67 pt./A of Scepter. On fine soils, apply 2.5 pts./A of Dual + .67 pt./A of Scepter.

Notes: (1) Do not apply within 90 days of harvest, and (2) Do not graze or feed treated soybean forage, hay, or straw to livestock, or illegal residues may result.

Dual + Lorox + Gramoxone or Roundup

On coarse soils*, apply 1.5 pts./A of Dual + 1-1.5 lbs./A of Lorox**. On medium soils, apply 2 pts./A of Dual + 1-2 lbs./A of Lorox. On fine soils, apply 2-2.5 pts./A of Dual + 2-3 lbs./A of Lorox.

*Do not use on loamy sand, except in the northeastern U.S. on loamy sand with over 1% organic matter, or injury may occur. Do not use on sand, gravelly soils, or exposed subsoils, or injury may occur.

**When using Lorox L, use equivalent rates. One pt. of Lorox L equals one lb. of Lorox wettable powder.

Precautions: (1) Do not use on soil with less than 0.5% organic matter or crop injury may occur. (2) Only water should be used as a carrier for Dual + Lorox L + Gramoxone or Roundup.

T. Stone Fruits - Dual Alone and Combinations

Stone fruits including: apricots, cherries (sweet, sour), nectarines, peaches, plums (chickasaw, damson, Japanese) and prunes.

Broadcast 2-4 pts./A of Dual by ground equipment to weed-free soil in a minimum of 10 gals. of water to apricots, cherries, nectarines, peaches, plums, or prunes to control weeds listed in the Dual Applied Alone section of this label. Apply the lower rates on coarse-textured soils with low organic matter and where the weed infestation is expected to be low. Apply the higher rates on fine-textured soils, soils high in organic matter, and where a heavy weed infestation is expected. Use caution when applying to keep the spray off the foliage of the tree crops to avoid excessive residues or possible foliar injury.

For control of browntop panicum, cocklebur, common purslane, hairy nightshade, lambsquarters, morningglory, ragweed, smartweed and velvetleaf, tank mix Dual at rates indicated above with 1.1 to 4.4 lbs./A, depending on the crop, of Princep Caliber 90 (or 1.25-5 lbs./A of Princep 80W, or 1-4 qts./A of Princep 4L) and apply to weed-free soil in a minimum of 10 gals. of water, keeping the spray off the foliage of the tree crops. Refer to the rate of Princep Caliber 90, Princep 80W, or Princep 4L for a given crop on the respective Princep label.

In the event weeds are present at the time of treatment, Dual alone or in tank mixture with Princep Caliber 90 (or 80W or 4L) may sequentially follow an application of Gramoxone or Roundup, or Dual alone or in tank mixture with Princep may be applied in tank mix combination with Gramoxone or Roundup. Gramoxone may be applied at rates of 3-5 pts./A. Roundup may be applied at rates ranging from 1-5 qts./A, depending on the weed species. Refer to the Roundup label for rate for various weed species. Direct applications containing Gramoxone or Roundup over the weeds, making certain to keep spray off foliage and stems of trees. Refer to the Princep Caliber 90 (80W or 4L), Gramoxone, and Roundup labels for other details relative to their individual use.

Notes: (1) Do not graze livestock in treated areas and (2) Do not feed or graze cover crops grown in treated orchards, or illegal residues may result. (3) To avoid crop injury, do not apply tank mixtures with Princep on nectarines or apricots and 4) Do not apply Dual to nonbearing trees transplanted in the orchard less than 30 days or before depressions around the trees have been filled in.

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U. Tree Nuts - Dual Alone and Combinations

Tree nuts including almonds, beech nuts, Brazil nuts, butter-nuts, cashews, chestnuts, chinquapins, filberts (hazel nuts), hickory nuts, Macadamia nuts, pecans, and walnuts (black and English).

Broadcast: 2-4 pts./A of Dual by ground equipment to weed-free soil in a minimum of 10 gals. of water to tree nuts to control weeds listed in the Dual Applied Alone section of this label. Apply the lower rates on coarse-textured soils with low organic matter and where the weed infestation is expected to be low. Apply the higher rates on fine-textured soils, soils high in organic matter, and where a heavy weed infestation is expected. Use caution when applying to keep the spray off the foliage of the tree crops to avoid excessive residues or possible foliar injury.

For control of browntop panicum, cocklebur, common purslane, hairy nightshade, lambsquarters, morningglory, ragweed, smartweed and velvetleaf, tank mix Dual at rates indicated above with 1.1 to 4.4 lbs./A, depending on the crop, of Princep Caliber 90 (or 1.25-5 lbs./A of Princep 80W, or 1-4 qts./A of Princep 4L) to weed-free soil in a minimum of 10 gals. of water, keeping the spray off the foliage of the tree crops. Refer to the rate of Princep Caliber 90, Princep 80W, or Princep 4L for a given crop on the respective Princep label. ✓

In the event weeds are present at the time of treatment, Dual alone or in tank mixture with Princep may be applied in tank mix combination with Gramoxone or Roundup. Gramoxone may be applied at rates of 3-5 pts./A. Roundup may be applied at rates ranging from 1-5 qts./A, depending on the weed species. Refer to the Roundup label for rate for various weed species. Direct applications containing Gramoxone or Roundup over the weeds, making certain to keep spray off foliage and stems of trees. Refer to the Princep Caliber 90 (80W or 4L), Gramoxone, and Roundup labels for other details relative to their individual use.

Notes: (1) Tank mixtures containing Princep may only be used on almonds, filberts, Macadamia nuts, pecans, or walnuts. (2) Do not graze livestock in treated orchards, or illegal residues may result. (3) Do not apply Dual to nonbearing trees transplanted in the grove less than 30 days or before depressions around the trees have been filled in, or crop injury may occur.

V. Dual Alone and Combinations - Field and Liner* Grown Woody Ornamentals

*Plants transplanted normally in rows in a nursery or similar area for further growth prior to transplanting to final growing place.

To control the weeds indicated below for approximately 60 days, use one of the following:

1. Dual: Barnyardgrass, crowfootgrass, fall panicum, giant foxtail, goosegrass, green foxtail, large crabgrass, red-root pigweed, smooth crabgrass, yellow foxtail, yellow nutsedge, and other weeds listed for Dual alone on this label.
2. Dual + Princep: Galinsoga, lambsquarters, purslane, ragweed, smartweed, yellow nutsedge, Venice mallow and other weeds listed for Dual alone on this label.

Apply Dual alone or in combination with Princep at the rates shown below in a minimum of 15 gals. of water per acre. Direct the spray towards the base of established ornamentals or ornamentals transplanted a minimum of 10 days. Apply before weeds emerge or after removing existing weeds. Use the higher rate of Dual alone on fine-textured soil and where heavy infestations of grass weeds are expected. Use the lower rate of Dual on coarse-textured soil and where light infestations of grass weeds are expected. Use the higher rate of Dual + Princep on fine-textured soils and where broadleaf weeds are expected to form a significant part of the infestation. Use the lower rate of Dual + Princep on coarse-textured soil and where light infestations of broadleaf weeds are expected. ✓

Apply Dual at 2-3 pts./A or Dual at 2-3 pts./A plus Princep 4L at 1.6-2 pts./A post-transplant to the field or liner grown woody ornamentals listed below. For band applications, use a proportional amount of herbicide. When using Princep 80W or Princep Caliber 90, use equivalent rates; 2 pts. of 4L equals 1.25 lbs. of 80W or 1.1 lb. of Caliber 90.

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Apply Dual alone or Dual + Princep as recommended above to the following field and liner grown ornamentals:

Dual Alone

- | | |
|--|---|
| Arborvitae (<u>Thuja</u> spp.)* | Honeysuckle (<u>Lonicera</u> spp.) |
| Aucuba (<u>Aucuba</u> spp.)* | Hybrid Tea Rose (<u>Rosa</u> spp.) |
| Azalea (<u>Rhododendron</u> sp.),
Hershey Red, Herbert, Purple
Splendor | Ivy (<u>Hedera</u> sp.), English |
| Barberry (<u>Berberis</u> spp.),
Mentor, Warty, Wintergreen | Japanese Andromeda (<u>Pieris</u> spp.)* |
| Box Tree (<u>Buxus</u> spp.) | Japanese Red Maple (<u>Acer</u> spp.) |
| Cotoneaster (<u>Cotoneaster</u> spp.)* | Juniper (<u>Juniperus</u> spp.)*,
Andorra, Creeping, Shore,
Bar Harbor, Blue Rug |
| Crabapple (<u>Malus</u> spp.)* | Leucothoe (<u>Leucothoe</u> spp.)* |
| Dogwood (<u>Cornus</u> sp.), Red Stem | Lilac (<u>Syringa</u> spp.) James
McFarland |
| Euonymus (<u>Euonymus</u> spp.), in-
cluding Purple Winter
Creeper | Liriope (<u>Liriope</u> spp.)* Silver
Sunproof |
| Firethorn (<u>Pyracantha</u> spp.) | Maple whips (<u>Acer</u> spp.)* |
| Forsythia (<u>Forsythia</u> spp.), in-
cluding Spring Glory and
Golden Bells | Miniature Rose (<u>Rosa</u> spp.) |
| Holly (<u>Ilex</u> spp.), American,
Boxleaf Japanese*, Japanese*,
Green Lustre Japanese | Mountain Laurel (<u>Kalmia</u> spp.) |
| | Osmanthus (<u>Osmanthus</u> spp.)* |
| | Pachysandra (<u>Pachysandra</u> spp.) |
| | Privet (<u>Ligustrum</u> spp.) |
| | Red Oak (<u>Quercus</u> spp.)* |
| | Rhododendron (<u>Rhododendron</u> spp.)* |
| | Rosebay (<u>Rhododendron</u> spp.) |
| | Spirea (<u>Spiraea</u> spp.) |
| | Viburnum (<u>Viburnum</u> spp.) |
| | Weigela (<u>Weigela</u> spp.)* |
| | Yew (<u>Taxus</u> spp.), Dwarf
Japanese*, Hicks |

*Use Dual + Princep on these field and liner grown ornamentals only.

Note: Length of weed control may be reduced when continuous wet soil conditions follow herbicide application.

Precautions: (1) Do not use on seedbeds or on unrooted cuttings, or crop injury may occur. (2) Do not use in greenhouses or other enclosed areas, or injury may occur.

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W. Storage and Disposal

Pesticide Disposal

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Wastes resulting from the use of this product are acutely toxic. Improper disposal of unused pesticide, spray mixture, or rinsate is a violation of federal law. Pesticide, spray mixture, or rinsate that cannot be used according to label instructions must be disposed of according to federal, state or local procedures. For guidance in proper disposal methods, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office.

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Container Disposal

Do not reuse empty container. Triple rinse (or equivalent), puncture and dispose of in a sanitary landfill, or by incineration, or by open burning, if allowed by state and local authorities. Keep out of smoke from burning containers.

This product may be stored at temperatures down to 30 degrees below 0°F.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire or other emergency, call (919) 292-7100 day or night.

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Precautionary Statements

Hazards to Humans and Domestic Animals

WARNING

The active ingredient, metolachlor, may cause skin sensitization reactions in certain individuals. Wear protective clothing (coveralls and gloves) while handling or using this product. Causes skin and eye irritation. Do not get in eyes, on skin, or on clothing. Harmful if inhaled. Avoid breathing spray mist.

Harmful if swallowed or absorbed through the skin. Wash thoroughly after handling. Avoid contamination of food.

First Aid: In case of contact, immediately flush eyes and/or skin with plenty of water. Call a physician. Remove and wash contaminated clothing before reuse.

If inhalation occurs, the victim should be moved to fresh air, and medical attention should be sought.

If swallowed, contact your local Poison Control Center, hospital, or physician immediately. If patient is unconscious, maintain breathing and heartbeat (CPR: cardiopulmonary resuscitation). If patient is conscious, induce vomiting (syrup of ipecac; if not available, stimulate back of throat with finger). Never give anything by mouth to an unconscious person!

Note to Physician: If swallowed, there is no specific antidote. Induce emesis and lavage stomach. Treat symptomatically! The use of an aqueous slurry of activated charcoal (such as Norit A) and a saline cathartic should be considered.

Environmental Hazards

Do not apply directly to water or wetlands (swamps, bogs, marshes, and potholes). Do not contaminate water by cleaning of equipment or disposal of wastes.

Groundwater and Surface Water Advisory

Metolachlor has been identified in limited sampling of groundwater and there is the possibility that it may leach through the soil to groundwater, especially where soils are coarse and groundwater is near the surface. Following

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application and during rainfall events that cause runoff, metolachlor may reach surface water bodies including streams, rivers and reservoirs.

Care must be taken when using this product to prevent back siphoning into wells, spills, or improper disposal of excess pesticide, spray mixtures or rinsates.

Check valves or antisiphoning devices must be used on all mixing and/or irrigation equipment.

Endangered Species

It is a violation of Federal laws to use any pesticide in a manner that results in the death of endangered species or adverse modification of their habitat.

The use of this product may pose a hazard to certain federally designated endangered species known to occur in specific areas within the CALIFORNIA counties of Merced, Sacramento and Solano. Before using this product in these counties, you must obtain the EPA Endangered Species Crop Bulletin. The bulletin is available from either your County Agricultural Extension Agent, the Endangered Species Specialist in your State Wildlife Agency Headquarters, or the Regional Office of either the U.S. Fish and Wildlife Service (Portland, Oregon) or the U.S. Environmental Protection Agency (San Francisco, California). THIS BULLETIN MUST BE REVIEWED PRIOR TO PESTICIDE USE. THE USE OF THIS PRODUCT IS PROHIBITED IN THESE COUNTIES UNLESS SPECIFIED OTHERWISE IN THE BULLETIN.

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Agricultural Division
CIBA-GEIGY Corporation
Greensboro, North Carolina 27419

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Dual®

Herbicide

For weed control in corn, cotton, nonbearing citrus, nonbearing grapes, peanuts, pod crops, potatoes, safflowers, grain or forage sorghum, soybeans, stone fruits, tree nuts and woody ornamentals

Active Ingredient:

Metolachlor: 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl) acetamide	86.4%
Inert Ingredients:	13.6%
Total:	100.0%

Dual contains 8 lbs. active ingredient per gallon

See directions for use in attached booklet.

EPA Reg. No. 100-597

2 1/2 Gallons
U.S. Standard Measure

Keep Out of Reach of Children.

WARNING
AVISO

PRECAUCIÓN AL USUARIO:

Si usted no lee inglés, no use este producto hasta que la etiqueta haya sido explicado ampliamente.

Precautionary Statements

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Harmful if swallowed or absorbed through the skin. Wash thoroughly after handling. Avoid contamination of food.

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SEE ATTACHED BOOKLET FOR PRECAUTIONARY LABELING PERTAINING TO THE USE OF THIS PRODUCT IN AREAS WHERE ENDANGERED SPECIES ARE FOUND.

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Dual® trademark of CIBA-GEIGY for metolachlor
U.S. Patent No. 3,937,730

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LABELS-D.3 - DUAL/B/F1

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April 16, 1987