



Dual® 25G

Granular Herbicide

For weed control in corn, peanuts,
potatoes, soybeans, and ornamentals

50 Pounds
Net Weight

ACCEPTED
JUL 22 1983
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 100-638

Active Ingredient:	
Metolachlor: 2-chloro-N-(2-ethyl- 6-methylphenyl)-N-(2-methoxy-1- methylethyl) acetamide	25.0%
Inert Ingredients:	75.0%
Total:	100.0%

Dual 25G is a granular herbicide

Keep Out of Reach of Children.

Caution

See additional precautionary statements
on back of bag.

EPA Reg. No. 100-638

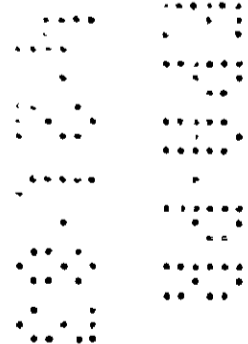
See directions for use on back of bag.

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Control No. 52600

Agricultural Division
CIBA-GEIGY Corporation
Greensboro, North Carolina 27419

CGA 49L23B



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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.

Directions for Use

It is a violation of federal law to use this product in a manner inconsistent with its labeling. In accordance with 40 CFR Part 170, no user shall permit the application of this product in such a manner as to directly or indirectly expose workers or other persons except those knowingly involved in the application.

FAILURE TO FOLLOW ALL PRECAUTIONS ON THIS LABEL MAY RESULT IN POOR WEED CONTROL OR CROP INJURY.

General Information

Dual 25G will control many annual grasses and certain broadleaf weeds in corn, peanuts, potatoes, soybeans, and ornamentals. It should be applied prior to the emergence of weeds. It may be incorporated into the surface 1-2 inches of soil prior to planting or left on the soil surface during or after planting. Dry weather following application of Dual 25G may reduce its effectiveness. Shallow cultivate if weeds develop or if tillage is necessary to improve the physical condition of the soil.

Precaution: Injury may occur following the use of Dual 25G under abnormally high moisture conditions during early development of the crop.

Weeds Controlled

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

Weeds Partially Controlled: common purslane, hairy nightshade, sandbur, seedling johnsongrass, and volunteer sorghum.

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Application Procedures

Dual 25G may be applied either broadcast or banded.

Broadcast Treatment - Dual 25G may be applied with a broadcast type granular applicator or with a cyclone type spreader. Use applicators and techniques that will apply the granules uniformly to the soil.

Band Treatment - Dual 25G may be applied with any standard granular applicator capable of uniformly distributing a predetermined amount of granules to a desired area. Band treatment made at seeding should only be applied behind the press wheel.

Note: Caution should be taken with seeding equipment so that any track (soil depression) made by the planter press wheel is minimal. This will reduce movement of granules into the press wheel track during heavy rain which can result in crop injury. Soil tillage should not follow the use of band applications unless it is adapted so as not to displace the band and hence reduce weed control in the band.

Applicator settings are given for band applications in Chart 1. These settings were determined under laboratory conditions to ±5% accuracy. Note that the settings may differ depending on speed of application, as well as rate per acre. It is important that the user calibrate each individual granular applicator prior to its use. Since the actual setting for each individual granular applicator may vary, the settings shown should serve only as guidelines for calibration.

Calculate the amount of Dual 25G needed for band treatment as follows:

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \text{Broadcast rate per acre} = \text{Band rate per acre}$$

Example: If 16 lbs. per acre is recommended for broadcast application and you wish to treat a band 14 inches wide in crop rows spaced 30 inches apart:

$$\frac{14}{30} \times 16 = 7.5 \text{ lbs. of granules needed for each acre that is to be treated.}$$

Do not apply Dual 25G during periods of high winds. Wind may disrupt placement of the granules and reduce weed control. Locate granular diffusers close to the ground to reduce granular displacement. Wind shield attachments are advisable.

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Chart 1: Granular Applicator Settings For 14 Inch Band Width*

Applicator Model	Equivalent Broadcast Rate Per Acre					
	Speed MPH	6 Lbs.	8 Lbs.	10 Lbs.	12 Lbs.	16 Lbs.
Gandy	4	11	13	14.5	16	18
	5	12.5	14	16	17.5	20.5
	6	13	15.5	17.5	20	22.5
International Harvester and Allis Chalmers	4	.80	1.0	1.0	1.2	1.35
	5	.92	1.1	1.15	1.38	1.6
	6	1.0	1.13	1.25	1.45	1.9
John Deere (Metal Box)	4	1/19	1/21	1/23	1/25	1/29
	5	1/21	1/23	1/25	1/28	2/1
	6	1/22	1/24	1/27	1/30	2/5
John Deere (Fiberglass Box)	4	7	8	10	11	14
	5	8	9	11	13	17
	6	9	10	12	14	18
Noble (Pre 1973)	4	4	5	6	8	10
	5	5	6	8	9	12
	6	6	7	9	11	13
Noble (1973 and Later)	4	3	4	5	6	7
	5	4	5	6	7	9
	6	5	6	7	8	10

*Settings are for application of the equivalent broadcast rates per acre indicated in a 14 inch band at speed (miles per hour) shown. If other than a 14 inch band is to be used, these settings do not apply and additional calibration will be necessary.

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Calibration of Band Applicators

To calibrate a granular applicator for a standard 14 inch band, a sample has to be collected while the applicator is either running or simulating a run over a distance of 500 ft.

Procedure:

1. Fill applicator box with Dual 25G.
2. Refer to Chart 1 on granular applicator settings and adjust the applicator setting to correspond to the desired rate per acre.
3. Attach a plastic bag or similar container to the applicator spout after detaching the delivery tube.
4. Make the 500 ft. run at planting speed.

Time required to cover 500 feet:

- 4 mph = 1 min. 25 sec.
- 5 mph = 1 min. 8 sec.
- 6 mph = 57 sec.

5. Measure the volume or weight of granules collected in ounces, and, if necessary, make successive runs until the setting is obtained that will deliver the correct number of ounces per 500 ft. of row as shown in Chart 2.
6. Repeat this procedure for each granular applicator box.

Chart 2: The Equivalent Broadcast Rate Per Acre in Volume and Weight for 500 Feet on the Basis of a 14 Inch Band

<u>Broadcast Rate Per Acre</u>	<u>Volume Collected In 14 Inch Band 500 Linear Feet</u>	<u>Weight Collected In 14 Inch Band 500 Linear Feet</u>
6 Lbs.	1.6 fl. oz.	1.3 oz.
8 Lbs.	2.2 fl. oz.	1.7 oz.
10 Lbs.	2.8 fl. oz.	2.2 oz.
12 Lbs.	3.2 fl. oz.	2.6 oz.
16 Lbs.	4.5 fl. oz.	3.5 oz.

For band widths other than 14 inches, the calibration distance will differ from 500 ft.

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For other band widths, calculate the relative calibration distance in which to collect the corresponding weight or volume of Dual 25G in Chart 2 as follows:

$$\frac{14 \text{ Inches}}{\text{Band width in inches}} \times 500 = \begin{array}{l} \text{Calibration distance} \\ \text{in feet} \end{array}$$

Example: A band width of 10 inches is to be used instead of 14 inches to apply Dual 25G at an equivalent rate of 10 lbs./broadcast acre.

A. $\frac{14 \text{ Inches}}{10 \text{ Inches}} \times 500 \text{ Ft.} = 700 \text{ Ft.}$

B. Collect 2.8 fl. oz. of volume or 2.15 oz. of weight for the newly calculated calibration distance of 700 ft. for a 10" band.

Corn

For control of annual grasses and broadleaf weeds listed under the General Information section, apply Dual 25G either preplant incorporated or preemergence to corn before weeds emerge.

Preplant: Broadcast Dual 25G to the soil and incorporate within the surface 1-2 inches of soil using the appropriate rate from Table 1 within 14 days before planting using appropriate surface incorporating equipment.

Preemergence: Band or broadcast Dual 25G to the soil surface during or after planting and before weeds emerge using the appropriate rate from Table 1. For band treatment, apply granules behind the press wheel.

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Table 1: Dual - Corn

Soil texture	Broadcast rate per acre	
	Less than 3% organic matter	3-6%* organic matter
COARSE: Sand, loamy sand, sandy loam	6-8 lbs.	8 lbs.
MEDIUM: Loam, silt loam, silt	8-10 lbs.	8-10 lbs.
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	8-10 lbs.	10-12 lbs.
Muck or peat soils	DO NOT USE	

*Dual 25G may be used up to 16 lbs. per acre on a broadcast basis on soils having an organic matter content greater than 6%.

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Peanuts

Dual 25G Single Applications - All Peanut Growing Areas:

Apply Dual 25G either preplant incorporated, postplant incorporated or preemergence, using the appropriate rate specified below. Preplant Incorporated: Broadcast Dual 25G to the soil surface and incorporate into the top 1-2 inches of soil before planting using a finishing disk, harrow, rolling cultivator, or similar implement capable of providing uniform 1-2 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 25G after bed formation. Postplant Incorporated: Broadcast or band Dual 25G to the soil surface and shallowly incorporate 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. Preemergence: Broadcast or band Dual 25G to the soil surface during planting (behind the planter) or after planting, but before weeds or crop emerge.

Apply Dual 25G at a broadcast rate of 6-12 lbs. per acre. Within the 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.

Note: Dual 25G 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. per acre; Treflan® at 1 pt. per acre; or Vernam® at 2.3-3 pts. per acre. Dual 25G may be applied as directed prior to a sequential treatment of Dyanap® applied preemergence to cracking time using 6 qts. Dyanap per acre as specified for use on that label.

Soybeans

For control of annual grasses and broadleaf weeds in the General Information section, apply Dual 25G either preplant incorporated or preemergence to soybeans before weeds emerge.

Preplant Incorporated: Broadcast Dual 25G to the soil surface and incorporate into the top 2 inches of soil using the appropriate rate from Table 2 within 14 days before planting using a finishing disc, harrow, or other appropriate tillage equipment.

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Preemergence: Band or broadcast Dual 25G to the soil surface during or after planting and before weeds emerge using the appropriate rate from Table 2. For band treatment, apply granules behind the press wheel.

Table 2: Dual 25G - Soybeans*

Soil texture	Broadcast rate per acre	
	Less than 3% organic matter	3-6% organic matter
COARSE: Sand, loamy sand, sandy loam	6-8 lbs./A	8 lbs./A
MEDIUM: Loam, silt loam, silt	8-10 lbs./A	8-10 lbs./A
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	8-10 lbs./A	10-12 lbs./A
Muck or peat soils	DO NOT USE	

*Dual 25G may be used sequentially in place of Dual 8E with Sencor®/Lexone®, Lorox®, Amiben™, Dyanap, or Premerge® 3 at their tank mix rate as specified on the Dual 8E label.

Potatoes

Apply Dual 25G either incorporated, preemergence, or after hilling/layby according to the 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 25G at 6-12 lbs. per acre to the soil and incorporate into the surface 1-2 inches of soil using appropriate tillage equipment. Planting and later cultural practices should not bring untreated soil to the surface. Postplant application may be made any time after planting to drag-off, but before potato emergence. Incorporate using an implement that distributes Dual within the top 1-2 inches of soil. Do not damage potato seed pieces or sprouts with incorporation equipment.

Preemergence: Apply Dual 25G at 6-12 lbs. per acre either after planting as a preemergence, delayed preemergence, after drag-off or hilling treatment, but before weeds emerge. Up to 16 lbs. per acre of Dual 25G alone may be used where soil organic matter is greater than 6%.

After Hilling/Layby: Apply 10 lbs. per acre of Dual 25G 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 25G application, but do not apply more than 22 lbs. of Dual 25G per acre in a single crop season.

Note: 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. Do not use on sweet potatoes or yams. Do not apply both as a preemergence and an incorporated treatment.

Potatoes treated with Dual should not be harvested within 60 days after a planting to drag-off application, or within 40 days after a layby application. Do not use in Kern County, California.

Ornamentals (Container, field and liner grown)

Apply Dual 25G using a cyclone or similar type applicator at rates indicated for control of annual grasses and yellow nutsedge.

Broadcast Dual 25G at the rate of 9-16 lbs. per acre to established ornamentals, or to ornamentals transplanted a minimum of 5 days, but before grass weeds or yellow nutsedge emerge, or after existing weeds or nutsedge plants have been removed. A second application may be needed to provide grass and yellow nutsedge control for an extended period. Do not make more than 2 applications per year.

Use the higher rate of Dual 25G on fine-textured soils, on high organic matter soils, in potting mixes, and where yellow nutsedge and heavy infestations of grass weeds are expected. Use the lower rate on coarse-textured soils with low organic matter content, and where light infestations of grass weeds are expected.

If band applications are to be used, apply an amount proportional to the fraction of an acre treated.

If annual broadleaf weeds are expected, a broadcast application of Princep® 4G at 20-25 pounds per acre may be made immediately before or after applying Dual 25G, following the application procedure as for Dual 25G. Use the higher rates of Princep 4G on fine-textured soils or soils with high organic matter, and the lower rates on coarse-textured soils or soils with low organic matter content.

Precautions: Do not use Dual 25G alone or in conjunction with Princep 4G on seedbeds or on unrooted cuttings or prior to transplanting. Do not apply Dual 25G to ornamentals whose foliage is wet for the granule may adhere to the foliage and cause injury. Should granules adhere to the foliage, irrigate soon after application to remove the granules and reduce potential damage.

DO NOT USE IN GREENHOUSES OR OTHER ENCLOSED STRUCTURES.

Container Grown Ornamentals

Use in holly (Ilex spp.) and juniper (Juniperus spp.).

Princep 4G may be used in conjunction with Dual 25G in holly and juniper.

Field and Liner Grown Ornamentals

Dual 25G in the following:

Arborvitae (<u>Thuja</u> spp.)*	Honeysuckle (<u>Lonicera</u> spp.)
Azalea (<u>Rhododendron</u> sp.), Hershey Red	Ivy (<u>Hedera</u> sp.), English
Cotoneaster (<u>Cotoneaster</u> spp.)*	Juniper (<u>Juniperus</u> spp.)*, Andorra, Creeping, Shore
Barberry (<u>Berberis</u> spp.), Mentor, Warty, Wintergreen	Leucothoe (<u>Leucothoe</u> spp.)*
Box Tree (<u>Buxus</u> spp.)	Mountain Laurel (<u>Kalmia</u> spp.)
Crabapple (<u>Malus</u> spp.)*	Osmanthus (<u>Osmanthus</u> spp.)*
Dogwood (<u>Cornus</u> sp.), Red Stem	Pachysandra (<u>Pachysandra</u> spp.)
Euonymus (<u>Euonymus</u> spp.)	Privet (<u>Ligustrum</u> spp.)
Firethorn (<u>Pyracantha</u> spp.)	Rosebay (<u>Rhododendron</u> spp.)
Forsythia (<u>Forsythia</u> spp.)	Weigela (<u>Weigela</u> spp.)*
Holly (<u>Ilex</u> spp.), American, Boxleaf Japanese*, Japanese*	Yew (<u>Taxus</u> spp.), Dwarf Japanese*, Hicks

*Dual 25G may be applied in conjunction with Princep 4G on these field and liner grown ornamentals.

Rotational Crops: 1) If crop treated with a preplant or pre-emergence application of Dual 25G is lost, corn, cotton, soybeans, safflower, peanuts, potatoes, grain sorghum*, or pod crops** may be replanted immediately. Do not make a second broadcast application of Dual 25G. If the original application was banded and the second crop is planted in the untreated row middles, a second banded treatment may be applied. 2) Barley, oats, rye, or wheat may be planted 4 1/2 months following a preplant or preemergence treatment. Corn, cotton, soybeans, peanuts, potatoes, 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 or pod crops to livestock. All other rotational crops may be planted 18 months after application.

3) Corn, cotton, soybeans, peanuts, potatoes, safflower, sorghum or pod crops may be planted in the spring following a layby treatment applied the previous season. All other rotational crops may be planted 18 months after a layby application.

*Provided the seed has been properly treated with Concep®.

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

Storage and Disposal

Store in a dry place. Do not contaminate water, food, or feed by storage, disposal, or cleaning of equipment. Open dumping is prohibited. Pesticide that cannot be used according to label instructions must be disposed of according to applicable federal, state, or local procedures. Completely empty bag by shaking, and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of bags in a sanitary landfill or by incineration if allowed by state and local authorities.

Precautionary Statements

Hazards to Humans and Domestic Animals

CAUTION

The active ingredient, metolachlor, may cause skin sensitization reactions in certain individuals. Wear protective clothing (coveralls and gloves) while handling or using this product. Harmful if swallowed, inhaled or absorbed through the skin. Avoid breathing dust. Causes eye irritation. Avoid contact with eyes, skin or clothing. Do not contaminate food or feed.

Practical Treatment: In case of contact with eyes or skin, wash immediately with plenty of water. Get medical attention if irritation persists. If inhaled, move to clean air. If swallowed, give one or two glasses of water and induce vomiting by placing fingers in back of throat, and contact a local poison control center, hospital or physician immediately. Never give anything by mouth to an unconscious person.

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Environmental Hazards

Do not apply directly to any body of water. Do not apply where runoff is likely to occur. Do not contaminate water by cleaning of equipment or disposal of wastes.

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

Amiben™ trademark of Union Carbide Agricultural Products, Inc.

Balan® trademark of Elanco Products for benefin

Concep® trademark of CIBA-GEIGY
U.S. Patent No. 4,070,389

Dyanap® trademark of Uniroyal Chemical for Alanap®-Dinitro

Lexone® trademark of E. I. duPont de Nemours and Co. for
metribuzin

Lorox® trademark of E. I. duPont de Nemours and Co. for linuron

Premerge® trademark of the Dow Chemical Company for dinoseb

Princep® trademark of CIBA-GEIGY for simazine

Sencor® trademark of the Parent Company of Farbenfabriken Bayer
GmbH, Leverkusen, for metribuzin

Treflan® trademark of Elanco Products for trifluralin

Vernam® trademark of Stauffer Chemical Company for vernolate

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