

Submitted to EPA 1/11/89

10F9
PM25
264-377

CERONE® Plant Regulator

For Reducing Lodging in Barley and Wheat

For Agricultural or Commercial Use Only
Not For Residential Use

ACTIVE INGREDIENT:
 Ethephon (2-chloroethyl) phosphonic acid* 39.9%

INERT INGREDIENTS: 60.1%

(e) Contains four pounds ethephon per gallon

EPA Reg. No. 264-377

EPA EST NO. 264-PA-01

**KEEP OUT OF REACH OF CHILDREN
DANGER**

Precautionary Statements: See Inside Booklet

**IN CASE OF EMERGENCY TELEPHONE (24 HOURS A DAY)
IN THE U.S.A. 1-800-521-8235**

FOR GENERAL PRODUCT INFORMATION 800-334-9745

The use of this product for a variety of plant growth regulation uses is protected by various United States and foreign patents including U.S. Patents 3,879,188 and 4,240,819. No license is granted to use this product in countries other than the United States or for any use not contemplated by this label. Liability for patent infringement may result from use or sale of this product outside the United States.

RHONE-POULENC AG COMPANY
Post Office Box 12014, T. W. Alexander Drive
Research Triangle Park, North Carolina 27709

CERONE is a registered trademark of RHONE-POULENC.
Bayleton is a registered trademark of Mobay Chemical Corp.
TR is a registered trademark of Ciba-Geigy Corp.
Dithane is a registered trademark of Rhom and Haas Co.
Manzate is a registered trademark of E.I. du Pont de Nemours & Co.

ACCEPTED
 MAR 15 1989

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 264-377

Made in USA

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PRECAUTIONARY STATEMENTS

DANGER HAZARDS TO HUMANS AND DOMESTIC ANIMALS

Corrosive. Causes irreversible eye damage. Causes skin irritation. Do not get in eyes, on skin or on clothing. Wear full-length trousers, long-sleeved shirt, protective gloves, and goggles or face shield when handling.

Harmful or fatal if swallowed. Avoid contamination of food. Avoid inhalation of spray mist. May cause respiratory irritation. Change to clean work clothes daily. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove and wash contaminated clothing before reuse. Keep away from domestic animals.

STATEMENT OF PRACTICAL TREATMENT

GENERAL

Call a physician in cases of suspected poisoning. If poisoning is suspected in animals, call a veterinarian.

IF ON SKIN: Flush immediately with plenty of water for at least 15 minutes. Remove contaminated clothing.

IF INHALED: Stop spraying and move to uncontaminated area. Call a physician.

IF IN EYES: Flush immediately with plenty of water for at least 15 minutes and call a physician.

IF SWALLOWED: Do not induce vomiting. Promptly drink a large quantity of milk, egg whites, gelatin solution or if these are not available, drink large quantities of water. Avoid alcohol. Call a physician immediately.

NOTE TO PHYSICIAN

There is no specific antidote. Treatment should be directed at the control of symptoms and clinical conditions. This material possesses the characteristics of a strong acid, and may cause mucosal damage if swallowed. Do not induce vomiting. Gastric lavage should be undertaken with care if necessary. Appropriate conventional treatment for circulatory shock, respiratory depression and convulsions may be needed.

ENVIRONMENTAL HAZARDS

Do not apply directly to water or wetlands (swamps, bogs, marshes, and potholes). Do not contaminate water when disposing of equipment washwaters.

Do not contaminate water used for irrigation or domestic purposes.

Do not apply CERONE® Plant Regulator through any type of irrigation system.

Avoid spray drift to nearby crops as this product will cause modifications in plant growth. Plant injury or reduced yields may result. Do not plant another crop within 30 days after treatment.

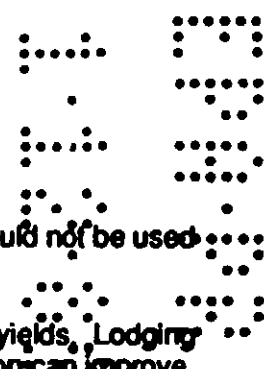
IMPORTANT

Do not use this product for purposes other than those listed on the label.

GENERAL INFORMATION

CERONE® Plant Regulator is intended for use in barley and wheat to reduce lodging. CERONE® should not be used in non-lodging situations or where losses due to lodging may be negligible.

Lodged crops increase harvest costs, reduce harvest efficiency and often decrease recoverable grain yields. Lodging also contributes to uneven maturity, higher moisture content and loss of grain quality. Lodging reduction can improve harvest efficiency and grain recovery.



The primary effect of CERONE® Plant Regulator is increased straw strength which increases the plant's resistance to lodging. CERONE® may also shorten the plant depending on variety, environmental conditions and the rate used. CERONE® also reduces "necking" in barley and the resulting yield decreases due to shattering and head loss prior to harvest.

Since CERONE® Plant Regulator treatment improves lodging resistance, barley and wheat crops can be managed for maximum economic yield. Variety selection, seeding, fertility, weed, disease and insect control are all important considerations. Consult your local extension service for recommendations for your area.

USE PRECAUTIONS

Yield or quality decreases may occur if CERONE® is not properly used.

CERONE® Plant Regulator should be used only on vigorously growing grain crops that are likely to lodge.

Management practices aimed at maximizing economic yields can produce conditions conducive to disease development. If disease is present such as rust, septoria, or mildew, CERONE® treatment may enhance the severity of the disease. Growers planning to use CERONE® Plant Regulator should plant disease-resistant varieties or monitor their crop for disease and use effective fungicides.

Do not apply CERONE® Plant Regulator to crops already lodged, or under stress from insect or disease damage. For moderate insect or disease pressure use appropriate control measures alone or in a tank mix with CERONE® as recommended on this label.

Do not apply CERONE® if lack of moisture or other conditions make lodging unlikely as application under such conditions may result in yield loss.

Do not apply CERONE® Plant Regulator to crops under moisture stress or under temperature stress or on saline soils as this may result in yield loss.

Do not apply CERONE® if daytime temperatures are expected to exceed 85°F in non-irrigated or 90°F in irrigated crops, if temperatures are expected to fall below 35° F, or if wide fluctuations in temperatures are expected within 5 days of application.

CERONE® may delay heading approximately 1-2 days and harvest maturity approximately 1-4 days. Extreme temperatures (below 35°F or greater than 85°F in non-irrigated and 90°F in irrigated crops) within 5 days after application may result in further maturity delay.

For CERONE® to be effective the temperature following application should be at least 60°F.

Do not apply CERONE® to crops seeded later than local recommendation. This is especially important in small grain production areas with short growing seasons where possible maturity delay may increase harvest difficulties.

CERONE® treatment may produce undesirable secondary tillers in some spring barley varieties especially under moisture or temperature stress.

Treatment is not recommended for Azure barley or Tyler wheat.

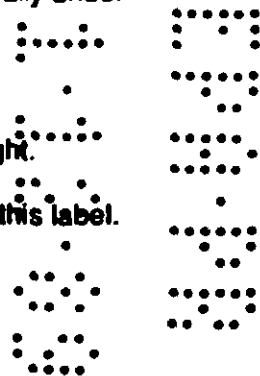
Mix only the amount of spray you expect to use each day. Do not allow mixed solution to stand overnight.

Do not add adjuvants, surfactants or wetting agents to CERONE® other than those recommended on this label.

Do not tank mix with herbicides or nitrogen solutions.

Avoid spray overlap which may result in an excess application rate and yield decrease.

Do not apply CERONE® if rain is expected within 4 hours.



Allow 7 days following application for the beginning of lodging reduction activity.

Do not enter treated fields within 24 hours after application unless protective clothing is worn.

DO NOT GRAZE OR FORAGE TREATED CROP OR CUT FOR HAY OR SILAGE. Mature straw at normal harvest may be consumed by animals.

TREATMENT DECISION GUIDE

It is important to inspect fields immediately prior to application to determine if lodging is expected. Use CERONE® only under the following conditions:

1. The crop is expected to lodge and result in significant loss of recoverable yield, grain quality, and/or harvest efficiency.
2. The crop is not under stress from disease or insect damage.
3. Soil moisture or irrigation is adequate to prevent crop stress for 7 days following application.
4. Temperature fluctuations (below 35°F or above 85°F non-irrigated and 90°F irrigated) are not expected for 5 days after application.
5. Application can be made between growth stages 8 to 10.

SPRAY PREPARATION

Mixers, loaders and applicators must wear a full face shield, long trousers, long sleeved shirt, gloves, and boots to avoid as much skin and eye contact as possible.

Add 1/2 to 3/4 of the required amount of water to the spray tank and begin agitation. Add the required amount of CERONE® Plant Regulator, followed by the remaining amount of water. Prepare only as much spray solution as can be used on the day of mixing. Do not allow spray solution to stand overnight.

Do not spill the concentrated product on spray equipment, or any airplane parts. ANY SPILLS SHOULD BE RINSED IMMEDIATELY WITH PLENTY OF WATER AS CERONE® PLANT REGULATOR IS CORROSIVE. Use of a nurse tank is highly recommended for avoiding possible spills of concentrated formulation on spray equipment or airplane parts.

EQUIPMENT CLEANING

Because of the acidic nature of this product, prolonged exposure to spray deposit will damage acrylic plastics, certain paints, and metals. Rinse thoroughly with a detergent and water all exposed acrylic plastic-type materials (e.g., aircraft windshields), and painted surfaces within an hour after exposure to spray deposits. At the end of each day, rinse thoroughly with a detergent and water the spray system and all the metal parts of the aircraft exposed to the spray deposits.

COMPATIBILITY

CERONE® Plant Regulator can be tank-mixed with approved cereal fungicides including: Till®, Bayleton®, and mancozeb (Dithane® M-45, Manzate® 200). Triton CS-7 can be added to mancozeb fungicide as specified on mancozeb product labels. Other spray adjuvants are not recommended. Adequate spray tank agitation is recommended when using fungicide tank mixtures. Do not tank mix with herbicides or nitrogen solutions. Note the CERONE® rate is limited to 0.5 pint per acre in tank mixes with Till on non-irrigated barley and wheat.

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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.

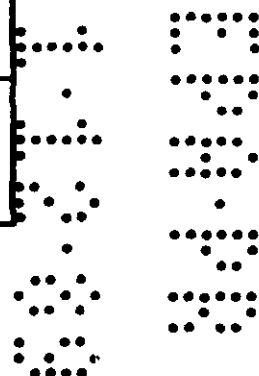
APPLICATION TIMING

Apply when the flag leaf is just visible to boot stage, but before the awns have emerged or the sheath has split (Feekes-Large Scale 8-10, Zadok's Code 37-45). Do not allow spray solution to contact exposed heads, as damage and reduced yield may result. Inspect fields carefully to determine that application can be made at the proper stage.

GROWTH STAGE CHART



Growth Description	2nd node detectable	Flag leaf just visible	Flag leaf ligule visible	Boot swollen	First spikelet visible	3/4 of inflorescence completed
Feekes - Large Scale	7	8	9	10	10.1	10.4
Zadok's Code	32	37	39	45	50	57
Recommended CERONE treatment time	Too Early				Too Late	



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APPLICATION

In some areas late seeded barley may be subject to extreme hot weather during anthesis which can result in yield loss. In this situation do not use CERONE® as yield losses may be increased. For this reason do not apply after July 1 in Minnesota and North Dakota.

Do not apply to crops on non-irrigated saline soils. Saline soils can increase plant stress particularly under low moisture or low fertility conditions. In non-irrigated areas, CERONE® should be used only on fields with salinity levels less than 1.0 mmho (ECe, millimhos/cm @ 25°C).

Do not apply to crops without good subsoil moisture at boot stage.

GROUND: CERONE® Plant Regulator should be applied in a minimum of 7 gallons of water per acre when applied by conventional ground equipment. With conventional ground equipment the use of flat fan nozzles is recommended. A minimum of 5 gallons of water per acre may be applied when using controlled droplet application (CDA) or air foil type equipment. Sprayer boom height must be far enough above the crop canopy to allow a uniform spray pattern. Sprayer speed should not exceed 10 mph to insure adequate coverage.

AIR: CERONE® Plant Regulator should be applied in a minimum of 3 gallons of water per acre by air.

USE RATES

For CERONE® use rates follow the directions below for non-irrigated and irrigated barley and wheat crops. Generally where moderate lodging pressure is expected 0.5 pint per acre will provide adequate lodging reduction. And in most situations where heavy to severe lodging pressure is expected 0.5 to 0.75 pint will effectively reduce lodging.

The 1.0 pint rate should be limited to situations where lodging is expected to result in a high loss of yield potential for example: 1) an irrigated crop with unusually severe lodging pressure, 2) an exceptionally tall lodging prone variety, or 3) a cercal type such as durum known to be subject to severe lodging.

It is important to remember that management practices and environmental conditions will greatly effect the amount of lodging pressure and rate of CERONE® needed.

Some varieties may be more responsive or sensitive to CERONE® than others. On such varieties the CERONE® rate should be limited to 0.5 pint per acre. Consult your state extension specialist or Rhone-Poulenc representative for more information.

DO NOT APPLY MORE THAN A TOTAL OF 1.0 PINT (0.5 LB ACTIVE) OF CERONE® PLANT REGULATOR PER ACRE PER YEAR.

DO NOT HARVEST WHEAT OR BARLEY WITHIN 40 DAYS OF LAST CERONE® APPLICATION.

NON-IRRIGATED BARLEY AND WHEAT:

DO NOT APPLY CERONE® Plant Regulator to non-irrigated barley and wheat in the states of Arizona, California (except in the Sacramento Valley and west of the coastal range), Colorado, Idaho, Montana, New Mexico, Nevada, North Dakota (except the Red River Valley), Oregon (except west of the Cascade Range), South Dakota, Texas, Utah, Washington (except west of the Cascade Range), Wyoming, or where summer fallow is required to produce a crop. This includes those areas where expected annual precipitation is less than 20 inches.

CERONE® IS RECOMMENDED in other non-irrigated areas of the U.S. and the following Western non-irrigated areas: in the Sacramento Valley and west of the Coastal Range in California; west of the Cascade Range in Washington

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and Oregon; and in the Red River Valley of North Dakota when soil moisture is adequate to prevent crop stress. This includes those areas where expected annual precipitation is greater than 20 inches.

IMPORTANT:

Limit the CERONE® rate to 0.5 pint/acre when used in combination with Tilt® in non-irrigated wheat and barley.

Limit the CERONE® rate to 0.5 pint/acre when temperatures are 80 - 85°F.

Do not use CERONE® if daytime temperatures for the period 5 days after application are expected to exceed 85°F.

IRRIGATED BARLEY AND WHEAT

Prior to treatment with CERONE® irrigation is recommended to avoid stress. Irrigation may be resumed 24 hours after treatment and should be resumed if conditions are hot and dry and continued until grain head filling is completed.

Moisture and/or heat stress during anthesis and grain filling periods have been shown to cause loss of significant yield potential. With CERONE® use, avoiding plant stress during these growth periods is essential in obtaining optimum grain yield and quality.

IMPORTANT:

Limit the CERONE® rate to 0.5 pint/acre when temperatures are 85 - 90°F.

Do not use CERONE® if daytime temperatures for the period 5 days following application are expected to exceed 90°F.

SPRING AND WINTER BARLEY

Use 0.5 pint where moderate lodging is expected, 0.5 to 0.75 pint if heavy lodging pressure is expected. Some tall varieties with vigorous growth may require 1 pint per acre.

SPRING WHEATS

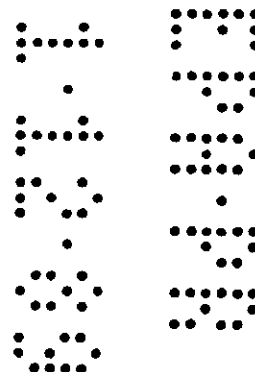
For most spring wheats and most situations use 0.5 pint per acre. Use 0.75 pint where severe lodging pressure is expected.

DURUM WHEATS

Use 0.5 pint per acre in moderate lodging situations including semi-dwarf durum varieties. Under heavy pressure 0.75 pint may be required. Use 0.75 to 1.0 pint where severe lodging is expected. In severe lodging situations these rates may not be adequate to control lodging in some tall durum wheats such as "Vic".

WINTER WHEATS (hard red, hard white, soft red, soft white)

Use 0.5 pint for moderate lodging pressure, 0.5 to 0.75 for heavy lodging pressure and 0.75 to 1.0 pint if severe lodging pressure is expected. In severe lodging situations these rates may not be adequate to control lodging in some tall straw varieties such as "Roughrider" and "Agassiz".



CERONE® RATE GUIDE FOR BARLEY AND WHEAT
READ DETAILED DIRECTIONS IN THIS LABEL FIRST

SITUATION	EXPECTED LODGING PRESSURE		
	MODERATE	HEAVY	SEVERE
	(CERONE® PINTS/ACRE)		
BARLEY (spring & winter)	1/2	1/2 to 3/4	3/4 to 1
WINTER WHEAT	1/2	1/2 to 3/4	3/4 to 1
MOST SPRING WHEATS	1/2	1/2	3/4
DURUM WHEATS	1/2	1/2 to 3/4	3/4 to 1
HIGH TEMPERATURE ¹ OR SENSITIVE VARIETY	1/2	1/2	1/2

NOTE:

1 Non-irrigated--80 to 85°F limit rate to 1/2 pint/acre and above 85°F do not treat.
 Irrigated-----85 to 90°F limit rate to 1/2 pint/acre and above 90°F do not treat.

GRASS SEED PRODUCTION

In grasses grown for seed, lodging prior to pollination can reduce yield potential and harvest efficiency. To reduce lodging use 1 to 2 pints (0.5 to 1.0 lb. active ingredient) CERONE® Plant Regulator per acre. Apply between growth stages 8 and 10 on the Feekes-large Scale (o. equivalent growth stage). Where severe lodging is expected apply 1 pint at growth stage 5-6 followed by 1 pint at growth stage 8-9.

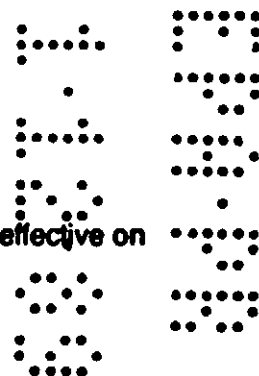
The addition of a surfactant may enhance product effectiveness. However under some conditions (i.e. stress) certain surfactants may cause unacceptable foliage damage.

USE PRECAUTIONS

Do not apply to exposed seed heads as damage and reduced yield may result.

Do not graze or forage treated fields.

CERONE® is most effective on tall fescues, perennial and annual rye grasses. CERONE® may not be effective on other grass species.



STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

If container is broken or contents have spilled, follow all precautions indicated above and clean up immediately. Before cleaning up, put on full-length trousers, long-sleeved shirt, protective gloves and goggles or face-shield. Soak up spill with absorbent media such as sand, earth or other suitable material and dispose of waste at an approved waste disposal facility.

PESTICIDE DISPOSAL

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL

Do not reuse empty container. Triple rinse or equivalent. Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

LIMITED WARRANTY AND DISCLAIMER

The manufacturer warrants (a) that this product conforms to the chemical description on the label; (b) that this product is reasonably fit for the purposes set forth in the direction for use when it is used in accordance with such directions; and (c) that the directions, warnings and other statements on this label are based upon responsible experts' evaluation of reasonable tests of effectiveness, of toxicity to laboratory animals and to plants, and of residues on food crops and upon reports of field experience. Tests have not been made on all varieties or in all states or under all conditions. THE MANUFACTURER NEITHER MAKES NOR INTENDS, NOR DOES IT AUTHORIZE ANY AGENT OR REPRESENTATIVE TO MAKE, ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, AND IT EXPRESSLY EXCLUDES AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

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