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Systems Integration Group, Inc.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

AUG 8 1996

Desiree L. Little
American Cyanamid Company
Agricultural Research Center
P.O. Box 400
Princeton, NJ 08543-0400

Subject: CYCLOCEL plant growth regulant
EPA Registration Number 241-74
Your amended label dated June 10, 1996

Dear Dr. Little:

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, is acceptable provided that you:

1. Specify in the product labeling whether rates listed in are based on the amount of total product or active ingredient.
2. In the table "PREPARATION OF CYCLOCEL SOLUTIONS", change "oz" to "fl. oz.", "ml" to "mL", and "l" to "L".
3. Submit one copy of your final printed labeling before you release the product for shipment.

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

In addition, we suggest that you specify on the label that this product may be used in greenhouses.

If you have any questions about this letter, please contact Tobi Colvin-Snyder of my staff at 703-305-7801.

Sincerely,

A handwritten signature in black ink, appearing to read "C/P" or similar initials.

Cynthia Giles-Parker
Product Manager (22)
Fungicide-Herbicide Branch
Registration Division (7505C)

RECD EPA/OPP/DPD1

CYCOCEL®

plant growth regulant

'96 JUN 10 P2:11

FOR USE ON ORNAMENTALS

Active Ingredient: Chlormequat (2-chloroethyl)trimethylammonium chloride	11.8%
Inert Ingredients	88.2%
Total	100.0%

(1 gallon contains 1 pound (2-chloroethyl)trimethylammonium chloride)

EPA Reg. No. 241-74-AA

EPA Est. No. 5905-AR-01

**KEEP OUT OF REACH OF CHILDREN
CAUTION!/PRECAUCION!**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
If you do not understand the label, find someone to explain it to you in detail.

In case of emergency endangering life or property involving this product, call collect, day or night, Area Code 201-835-3100.

See Additional Precautionary Statements Inside. See Directions For Use Inside.

American Cyanamid Company
Agricultural Products Division
Specialty Products Division
Wayne, NJ 07470 ©1996

**ACCEPTED
with COMMENTS
In EPA Letter Dated**

AUG 8 1996

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

241-74

Net Contents: 1 Gallon (3.78 liters)

®Registered Trademark of American Cyanamid Company

STATEMENT OF PRACTICAL TREATMENT

- If Swallowed:** Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of the throat with a finger. DO NOT induce vomiting or give anything by mouth to an unconscious person. Avoid alcohol.
- If in Eyes:** Flush eyes with plenty of water. Call a physician if irritation persists.
- If on Skin:** Flush with plenty of water. Get medical attention if irritation persists.
- Note to physician:** The use of Atropine is contraindicated.

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS****CAUTION!**

Harmful if swallowed or absorbed through the skin. Avoid contact with skin, eyes, or clothing.

Personal Protective Equipment (PPE):**Applicators and other handlers must wear:**

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations:

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This product is toxic to wildlife. Keep out of lakes, streams and ponds.
DO NOT contaminate water when disposing of equipment washwaters.

DIRECTIONS FOR USE

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

DO NOT apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Observe all Precautionary Statements, Limitations, and Application instructions on the CYCOCEL plant growth regulant package label.

DO NOT apply this product through any type of irrigation system.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, waterproof gloves, shoes plus socks.

STORAGE AND DISPOSAL

DO NOT STORE BELOW FREEZING TEMPERATURES.

Storage: DO NOT contaminate water, food or feed by storage.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

GENERAL INFORMATION

Read all sections of this label before using CYCOCEL.

CYCOCEL is a plant growth regulator for use on ornamentals. CYCOCEL enhances the crops aesthetic appeal and improves durability during postproduction shipping and handling. Treated crops are more compact with shorter internodes, stronger stems and greener leaves.

CYCOCEL should be used on healthy plants grown under proper conditions and is not a replacement for good cultural practices. CYCOCEL contains a wetting agent; therefore, additional wetting agents are not needed. If any adjuvants or other chemicals are applied with CYCOCEL, small test areas should be treated first to insure that no crop injury will occur. Plants treated with CYCOCEL may use less water, and irrigation schedules may need to be adjusted to prevent over irrigation.

GROWTH REGULATION WITH CYCOCEL:

CYCOCEL will normally reduce internode elongation for a period of 1 to 3 weeks following spray treatment, depending on crop culture, environmental conditions and plant growth habit. Multiple applications can be applied as needed. CYCOCEL has greatest effect on final plant height when applied at the beginning of rapid stem elongation and will have less effect if applied when shoots are not elongating or at the end of an elongation phase. CYCOCEL application rate, timing and frequency should be adjusted depending on individual grower preferences for crop development.

SPRAY APPLICATIONS:

In spray applications, CYCOCEL enters the plant through young expanding leaves, mature leaves and stems. Maximum effect occurs when CYCOCEL is applied to thoroughly cover plant leaves and stems. The spray volume providing thorough plant coverage will vary with plant size and foliage cover, but generally is between 2 and 3 quarts of spray solution per 100 square feet of bench space. Greater spray volumes that result in heavy runoff of spray solution from the plant are a waste of chemical and are undesirable. CYCOCEL can be applied in light spray volumes at about 1 quart per 100

square feet, which will reduce growth of upper lateral shoots and have less effect on lower shoots that receive less CYCOCEL spray.

CYCOCEL penetrates into the plant to provide maximum effect while the spray solution stays wet. Therefore, greater effect is obtained if sprays are applied under conditions that support slow drying of spray solutions. It is desirable to time CYCOCEL applications so that overhead irrigation or rain will not occur for a period of 6 hours after sprays are applied.

Unless otherwise stated in the section under specific crops, CYCOCEL spray application rates range from 800 to 4,000 ppm depending on the crop and individual user's desired results. The suggested initial CYCOCEL rate for small-scale trials is 1,250 ppm.

CYCOCEL PHYTOTOXICITY:

Foliar spray applications of CYCOCEL often will cause slight yellowing near leaf margins or at the tip of leaves that are small and rapidly enlarging at time of application. The discoloration appears about 3 to 5 days after the spray treatment. Mature leaves at time of spray and leaves formed after application are not affected. Discolored areas usually regain most or all green color by the end of the crop cycle. The degree of yellowing is related to CYCOCEL application rate. The lowest rates do not cause any phytotoxicity or temporary discoloration. Before application rates of 1,500 ppm or greater are used, trials should be conducted to insure that the amount of leaf spotting is not unacceptable to the user. CYCOCEL application rates that are too high may cause brown necrotic areas on leaf margins, which will not recover green color. If the amount of yellowing is too great, CYCOCEL application rates should be lowered to reduce phytotoxicity or temporary discoloration and more frequent applications at lower rates made to achieve desired height control.

Users should not apply CYCOCEL near the end of a crop unless they have conducted adequate trials to insure the CYCOCEL rate is low enough to avoid an undesirable appearance during the sales period.

DRENCH APPLICATIONS:

CYCOCEL can be applied as a drench to the growing medium. It is taken up by the plant through the roots and transported to the stem tips where it is active. Drench applications do not cause leaf yellowing and provide longer and more uniform control of stem elongation. In a drench treatment, it is the total amount of CYCOCEL active ingredient applied to each container that determines the reduction in stem elongation. Therefore, users must insure that both the amount of solution applied to each container and the concentration of CYCOCEL in ppm are correct.

Drenches should be applied so that the potting medium is uniformly saturated or non uniform heights will result when there are multiple plants in a container. Apply the drench to a moist medium and not when crops need irrigation. A good procedure is to irrigate crops one day and apply the CYCOCEL drench the next day.

CYCOCEL application rates for drench treatments range from 2,000 to 4,000 ppm. Users should do trials to determine the optimum rates under their particular conditions. The following table gives suggested volumes of dilute CYCOCEL solution to be applied to different size containers. The volumes applied can be altered, if the user has established the effect of different volumes through their own small-scale trials.

Pot diameter (inches)	Fluid ounces of dilute solution per pot	Number of pots treated with 1 gal. of solution
2 1/4 to 3	2	64.0
4	3	42.5
5	4	32.0
6	6	21.5
8	8	16.0

FACTORS AFFECTING ACTIVITY OF CYCOCEL

Plant growth and response to CYCOCEL is altered by several factors. The optimum CYCOCEL rate and frequency of application will vary depending on how the crop is grown.

ENVIRONMENTAL FACTORS:

Crops produced under low light levels and/or high humidity conditions will have a less compact growth habit and will generally require more CYCOCEL than the same crop produced at higher light levels and/or low humidities. Likewise, crops produced at higher temperatures or higher DIF (difference between day and night temperatures) will generally have greater stem elongation and require more CYCOCEL to produce the desired final plant height.

CULTURAL FACTORS:

Crops grown with greater amounts of irrigation, higher fertilization rates, or high amounts of ammoniacal nitrogen will be more lush and taller than crops grown "harder" with less irrigation, lower fertilizer, and predominately nitrate-nitrogen. The more lush crops normally require higher amounts of CYCOCEL or more frequent applications. Plants that are spaced close together will elongate rapidly when leaves begin to overlap, and more CYCOCEL is needed under these conditions to produce plants with the desired final heights.

The production schedule for **photoperiodic** crops and varieties, such as poinsettias and chrysanthemums, influences **final plant size**, and the amount of chemical needed to achieve the desired **final plant height** will vary with the production schedule. Crops that are grown under long schedules with more time between planting and start of flower initiation or between final pinch and flower initiation will be taller than crops grown using short production schedules.

VARIETY DIFFERENCES:

Varieties within a species often vary greatly in their growth habits and the amount of CYCOCEL required for optimum final height. Also, colors within a bedding plant series will vary in sensitivity to CYCOCEL. Generally, more vigorous, taller varieties require greater amounts of CYCOCEL than do less vigorous, shorter varieties. Users should consult with plant and seed suppliers and breeder companies for information on growth habit of varieties with which the user is not familiar.

DETERMINING OPTIMUM CYCOCEL USAGE

The optimum usage of CYCOCEL varies depending on the crop, the individual user's production situation and the desired final plant height and appearance. Users should determine the optimum CYCOCEL rate, timing, and frequency under their individual production situations. Users should obtain experience in small-scale trials under the different conditions where CYCOCEL is to be used before CYCOCEL is used on an entire crop. The CYCOCEL rates recommended in this label are general guidelines to be used by growers in trials to determine specific, optimum usage appropriate for their operations.

PREPARATION OF CYCOCEL SOLUTIONS

For Spray and Drench Applications

Concentration (ppm)	CYCOCEL (oz/gal)	CYCOCEL (ml/gal)	CYCOCEL (ml/l)
200	0.22	6.4	1.7
460	0.50	14.7	3.9
800	0.87	25.7	6.8
1,000	1.08	32.1	8.4
1,250	1.36	40.1	10.6
1,500	1.63	48.1	12.7
2,000	2.17	64.2	16.9
3,000	3.25	94.2	25.4
4,000	4.34	128.0	33.9

POINSETTIAS

CYCOCEL can be used to reduce stem elongation of all poinsettia varieties. It can be applied as needed to stock plants, cuttings during propagation, and before or after pinching plants grown for flowering.

Response of poinsettias to CYCOCEL varies with variety and geographical region of the United States. Higher rates and more frequent applications are needed in warmer production areas. For natural-season crops in the North, CYCOCEL should not be used after Oct. 15, except that reduced rates can be used until Oct. 21 if conditions are warm and sunny. In the South, CYCOCEL should not be used after Nov. 1. Late application times or excessive rates can cause reduced bract size and/or delayed flowering. If the crop is being produced for other than natural season, the last application should be no later than 6 weeks prior to flower maturity.

Spray applications can be made at rates between 800 and 1,500 ppm. Multiple applications may be made as needed at intervals between 3 and 14 days. Frequent reapplication may be needed if lowest application rates are used. At rates of 1,000 to 1,500 ppm, less frequent reapplication is needed. Higher CYCOCEL rates between 1,500 and 3,000 ppm often result in considerable leaf yellowing and are not frequently used, but may be applied if the user has adequately evaluated these rates.

Drench applications can be made to poinsettias using the procedures given in the Drench Applications section of this label. Drench application rates are 3,000 to 4,000 ppm. Drench treatments should not be made after the critical cut off dates given above for CYCOCEL applications to poinsettias.

GERANIUMS

CYCOCEL is recommended for controlling plant size of seed geraniums and vegetatively propagated geranium types. CYCOCEL is, also, recommended for inducing early flowering of seed geraniums.

CYCOCEL spray application rates on geraniums are from 800 to 1,500 ppm. Generally, first applications are made 2 to 4 weeks after planting plugs or rooted cuttings, after stems have started elongating. Multiple applications can be made as needed. To promote earlier flowering of seed geraniums, use 1,500 ppm. Make two spray applications at 35 and 42 days after seeding. Treated plants show decreased days to flowering, compact growth and more lateral breaks.

BEDDING PLANTS

CYCOCEL will effectively control the stem elongation of a wide variety of bedding plant crops grown in packs, pots, hanging baskets, and plug trays.

The growth rate of bedding plant crops varies greatly depending on growers' cultural practices. The use of CYCOCEL must be altered depending on grower practices and desired final plant size. Plant growth after transplanting is affected by the amount of CYCOCEL or other growth regulator applied to the plant during the plug stage. Therefore, use of CYCOCEL during the plug stage will reduce the amount needed after transplanting.

CYCOCEL spray application rates on bedding plants are 800 to 1,500 ppm, but may be increased up to 3,000 ppm after extensive trials to evaluate the effects of higher rates. First CYCOCEL sprays should not be applied until after transplanted plugs begin to grow and amount of growth control needed can be determined. For bedding plants in seedling stage, users should start evaluating CYCOCEL at one-half the rate used on finished bedding plants.

CYCOCEL will reduce the stem elongation on these and other bedding plant crops:

Ageratum	Jerusalem cherry
Celosia	Marigold
Dahlia	Nasturtium
Dianthus	Salvia
Cleome	Sunflower
Coleus	Verbena
Gomphrena	Vinca
Hypoestes	Zinnia

OTHER HERBACEOUS CROPS

CYCOCEL can be used to reduce stem elongation in other herbaceous crops not specifically listed, such as flowering potted plants, tropical and temperate perennials, and foliage plants. CYCOCEL can be applied to these crops either as a foliar spray or drench to the growing medium. The optimum CYCOCEL rate, timing of application and frequency will vary for different crops and amount of height control desired by individual users. Users should conduct trials with a small number of plants before CYCOCEL is used on entire crops.

Examples of other herbaceous crops that can be treated with CYCOCEL:

Achimenes	Ivy
Aster	Kalanchoe
Astilbe	Lilium spp.
Begonia, hiemalis	Morning glory
Begonia, tuberous	Pachystachys
Calceolaria	Pilea spp.
Carnation	Pentas
Chrysanthemum	Salvia spp.
Columbine	Schefflera
Easter Lily	Sedum spp.
Gynura aurantiaca	Sunflower

HIBISCUS

CYCOCEL is recommended to improve flowering and to produce compact plants with uniform shoot growth of *Hibiscus* spp. The CYCOCEL spray application rate range is between 200 and 600 ppm depending on variety growth habit and amount of control desired. Users should start with 460 ppm in trials. CYCOCEL should be applied in multiple applications to produce most uniform growth. CYCOCEL can be applied once before first and second pinches to produce more compact plants before final pinch. To produce the most compact flowering plants (height less than 18" in 6-inch pot), 3 to 4 applications may be needed after the final pinch, and first application should be made when laterals are 0.5 to 1 inch long.

AZALEAS

CYCOCEL produces earlier budded plants with multiple buds per shoot. Treated azaleas also have more compact, symmetrical heads. For crops produced out of season in a year-round production system, CYCOCEL can be used to induce flower bud set.

Azalea growth habit and response to CYCOCEL varies with variety, geographical region and production system. Optimum CYCOCEL spray rates generally range between 1,000 and 2,000 ppm in most situations, but may range to 4,000 ppm in some cases. Two to six multiple applications may be needed starting 3 to 5 weeks after last pinch (when laterals are about 2 inches long). Treated plants may flower a few days later than nontreated plants.

OTHER WOODY FLOWERING CROPS

Other woody flowering crops can be treated with CYCOCEL to produce more compact growth and earlier flower bud initiation. Plants can be treated prior to pinching or after the last pinch, as needed. Optimum application rates, timing, and frequency will be different for different crops. Users should evaluate CYCOCEL in small-scale trials to determine how best to apply it under their individual situations.

Examples of flowering woody crops that can be treated with CYCOCEL:

Baleria cristata	Hydrangea
Bougainvillea	Lantana
Camellia	Potted rose
Gardenia	Pseuderanthemum lactifolia
Fuchsia	Rhododendron
Hollies	

CYCOCEL/B-NINE¹ TANK MIX

On crops that are not very sensitive to CYCOCEL or when an excessive number of applications are required, a tank mix of CYCOCEL and B-Nine can be applied. **Users should recognize that this tank mix of CYCOCEL and B-Nine is more active than using either chemical alone.** Users of the tank mix should follow the guidelines given on the labels of both products. The tank mix is to be applied only as a foliar spray. Optimum rates of each product will vary depending on the crop, the user's preference for height control, and the individual production situation as described for using CYCOCEL alone. Users must test the use of the tank mix on a small scale before general use.

APPLICATION RATES

The application rate for CYCOCEL and B-Nine can be altered to adjust the degree of height reduction resulting from a spray treatment. In general, the highest CYCOCEL rate that does not cause excessive leaf yellowing can be used, and then the B-Nine rate can be raised or lowered to adjust the activity of the tank mix application.

The following table gives a range of application rates for CYCOCEL and B-Nine to use in establishing trials.

CYCOCEL and B-Nine tank mix spray rates:

Activity	CYCOCEL (ppm)	B-Nine (ppm)
Very High	1,500	5,000
High	1,500	2,500
Medium	1,250	1,250
Low	1,000	800

CONSIDERATIONS IN USING THE TANK MIX1. Bedding plants and general crops

The CYCOCEL and B-Nine tank mix is active on a wide range of crops. Users must evaluate its use under their individual production situations. The tank mix can be used on bedding plant plugs such as pansy and vinca with low risk of excessive reduction in size. It can be used at higher rates on plug crops such as salvia, marigold, and dahlia that require stronger chemical activity to produce desired height control.

2. Geraniums

The addition of B-Nine to CYCOCEL does not greatly enhance the height control achieved on geraniums.

3. Impatiens

The CYCOCEL and B-Nine tank mix has low activity on finished impatiens crops but will provide height control on impatiens plugs.

4. Poinsettias

Poinsettias are more sensitive to the combination of CYCOCEL and B-Nine than are other crops. **Use of tank mix application rates that are too high or application too late in the crop may cause reduced bract size and/or delayed bract coloring. The very high activity rates of CYCOCEL at 1,500 ppm and B-Nine at 5,000 ppm should not be used on poinsettias.** The high rates of 1,500 ppm CYCOCEL and 2,500 ppm B-Nine can be used on stock plants during the summer or on crops for flowering in the warmest regions. Outside of the warmest regions, growers should use the medium or low activity rates on crops for flowering. In all regions, applications to cuttings in propagation should be at the low or medium rates. **The CYCOCEL and B-Nine tank mix should not be applied to natural season poinsettias after September 25th or after start of short-days in photoperiod-controlled crops. After that date, the B-Nine should be omitted and CYCOCEL used alone as described in the CYCOCEL section of this label.**

DISCLAIMER

The label instructions 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 use or application of the product contrary to label instructions, all of which are beyond the control of American Cyanamid Company. All such risks shall be assumed by the user. American Cyanamid Company warrants only that the material contained herein conforms to the chemical description on the label and is reasonably fit for the use therein described when used in accordance with the directions for use, subject to the risks referred to above.

Any damages arising from a breach of this warranty shall be limited to direct damages and shall not include consequential commercial damages such as loss of profits or values or any other special or indirect damages.

American Cyanamid Company makes no other express or implied warranty, including any other express or implied warranty of FITNESS or MERCHANTABILITY.

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