UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

JUL 15 1993

Mr. S. K. Theodorakis
Senior Regulatory Coordinator
Zeneca Ag Products
P.O. Box 751
Wilmington, DE 19897

Dear Mr. Theodorakis:

SUBJECT: Amended Labeling
Bonzi® Ornamental Growth Regulator
EPA Reg. No. 10182-92
Your Letter Dated 05/17/93

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, is acceptable subject to the comments listed below. Five copies of the finished labeling must be submitted prior to releasing the product for shipment.

1. The label must comply with PR Notice 87-1. Add to your label the following prohibition statement "Do not apply this product through any type of irrigation system." or include chemigation directions as stated in PR Notice 87-1.

2. You must group together the precautionary statements on the front panel of the label **or** place a referral statement on the front panel of the label.

3. This acceptance of your label does not relieve you of any obligation to comply with the Worker Protection Standard (WPS). Under the WPS labeling regulations at 40 CFR part 156, subpart K, §156.200(c)(3), you are prohibited from distributing or selling any product within the scope of the WPS requirements after April 21, 1994, without amended labeling accepted by the Agency. If you have any questions about the WPS, please call the WPS Labeling Information Line at 1-800-777-2185.

Sincerely yours,

/S/

Cynthia Giles-Parker
Product Manager (22)
Fungicide-Herbicide Branch
Registration Division (H7505C)

BONZI®

Ornamental Growth Regulator ~~For Use on Container Grown Flower and Bedding Plants in Greenhouses and Shadehouses~~

ACTIVE INGREDIENT:	
Paclobutrazol	
(±)-(R*,R*)-beta-((4-Chlorophenyl)methyl)-alpha-(1,1-dimethylethyl)-1H-1,2,4-triazole-1-ethanol	00.4%
INERT INGREDIENTS:	99.6%
Total	100.0%

BONZI contains 0.12 g active ingredient per fluid ounce (4000 ppm).

EPA Reg. No.: 10182-92
EPA Est. No.:
U.S. Patent No.: 4,243,405

Net Contents:

KEEP OUT OF REACH OF CHILDREN

CAUTION

Made in U.S.A.
ZENECA Professional Products
ZENECA Inc.
Wilmington, DE 19897

ACCEPTED
with COMMENTS
In EPA Letter Dated:

JUL 15 1993

Under the Federal Insecticide [illegible], and Rodenticide Act [illegible], for the pesticide [illegible] under EPA Reg. No. 10182-92

STATEMENT OF PRACTICAL TREATMENT

IF ON SKIN: Wash with plenty of soap and water.

FOR 24-HOUR EMERGENCY MEDICAL ASSISTANCE CALL 1-800-F-A-S-T-M-E-D (327-8633)

FOR CHEMICAL EMERGENCY: Spill, leak, fire, exposure, or accident call CHEMTREC 1-800-424-9300.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

HARMFUL IF ABSORBED THROUGH SKIN. AVOID CONTACT WITH SKIN OR CLOTHING. Wear protective clothing, long-sleeved shirt, and rubber gloves. Remove contaminated clothing and wash before reuse. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

Do not contaminate water when disposing of equipment washwaters ~~by cleaning of equipment or disposal of wastes~~.

PHYSICAL AND CHEMICAL HAZARDS

Do not use or store near heat or open flames.

DIRECTIONS FOR USE

Read all label directions carefully before use.

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

GENERAL INFORMATION

BONZI® is a plant growth regulator for use on ornamental plants grown in containers in greenhouses, shadehouses, and interiorscapes ~~container-grown flower and bedding plants~~. Use of BONZI effectively reduces internode elongation, resulting in more desirable compact plants. When used as directed, BONZI produces no phytotoxic effects. ~~Desired height control may be obtained with a single BONZI spray or drench application. However, sequential applications may be desirable under certain conditions (See Sections I & V).~~

~~Users should note that different species and cultivars vary in their rate response to BONZI. Short, slow growing cultivars require a lower rate than tall, fast growing types. Overly stunted plants can result from rates that are too high, improper application techniques or improper timing.~~

MIXING INSTRUCTIONS

Be sure the sprayer is clean and not contaminated with any material. Fill the spray tank with half the required amount of water. Using the dilution table (Table 1), determine the amount of BONZI needed for the required concentration. Measure the desired volume accurately and add it to the tank.

Fill tank with the remaining amount of required water.

Agitate the mixture of BONZI and water frequently to assure uniform distribution during application.

TABLE 1
BONZI DILUTION TABLE

ppm BONZI Desired	Fl. Oz. Per Gallon	mL Per Gallon
1	0.032	1.0
2	0.064	1.9
3	0.096	2.8
4	0.13	3.8
5	0.16	4.7
10	0.32	9.5
20	0.64	19.0

ppm BONZI Desired	Fl. Oz. Per Gallon	mL Per Gallon
25	0.8	24.0
30	1.0	28.0
40	1.3	38.0
50	1.6	47.0
100	3.2	95.0
200	6.4	190.0

APPLICATION TECHNIQUES

Desired height control with BONZI can be obtained with three different types of applications: sprays, drenches or bulb soaks.

Under certain conditions, sequential spray applications may be desirable.

Frequent agitation of the BONZI solution and proper application techniques are critical in order to achieve desired results. Be sure of your calculations, volume measurements and sprayer calibration. When in doubt, recalculate.

1. SPRAY APPLICATIONS

In spray applications, BONZI penetrates into plant stems and is translocated to the terminal where it reduces internode elongation.

When applying a spray application, it is important that:

- adequate spray volume is used to thoroughly wet plant stems. The misting technique used for some other growth retardants, where only upper leaves are covered with a light spray, will not produce desired results with BONZI;
- sprays are not applied to the point of excessive runoff into the potting media. The spray volume which drips down into the media may be desirable as it will be taken up by the roots and increase the effectiveness of BONZI. However, too much runoff into the media may result in excessive height control;
- the spray technique provide thorough, consistent, uniform coverage of all plants. Failure to do so may result in non-uniform height control..

BONZI may be applied at any time of the day without danger of burning leaves or causing chlorosis.

Overhead irrigation or rain 30 minutes after spray applications does not reduce the effectiveness of BONZI.

Addition of wetting agents for spray applications is not necessary.

There are two methods of applications for insuring uniform coverage of BONZI sprays:

Bench Spray Method: The recommended spray volume for small plants in small containers which are closely spaced is 2 qts./100 sq. ft. of bench space. For larger plants with a well-developed canopy, a spray volume of 3 qts./100 sq. ft. of bench space is recommended.

Individual Plant Method: Apply sprays to individual plants, insuring that all plants of the same species/cultivar and size are treated with an equivalent amount of spray volume. Spray volume requirements will vary with plant size and type: For poinsettias in 6-inch pots with laterals from 1½ to 2 inches, the recommended spray volume is about 0.7 fl. oz. (20 ml.)

Sequential Applications: Using sequential applications may provide more uniform growth regulation and safety against over application. In general, sequential spray applications are to be applied using 50-100% of the lower recommended rate. Growers in cooler climates may have to use lower rates.

With some plant species, particularly chrysanthemums, hibiscus and azaleas, individual lateral shoots will outgrow the other laterals, causing non-uniform plant appearance. This results when individual laterals do not receive enough chemical when spray is applied. The use of sequential applications will reduce this problem.

2. DRENCH APPLICATIONS

Application of BONZI to the growing media will provide good control of plant height. BONZI is readily absorbed by plant roots and translocated to the terminals.

Drench applications generally provide a longer-lasting, more uniform height control than spray applications. Drench applications should be made to moist potting media. This may be achieved by watering plants the day before treatments. Drench applications to dry media will result in poor distribution.

Multiple plants growing in the same pot require a more uniform distribution of drench solution to achieve uniform height control.

Drench Rates and Volumes: The rates recommended for soil drench applications are based on a drench volume of 4 fl. oz. of final solution for an average 6-inch 'azalea' pot. Based on this recommendation, one gallon of solution will treat 32 6-inch pots. For smaller or larger pots, a suitable drench volume is enough final solution applied to achieve total run through of no more than 10%, providing that the potting media is properly moist before treatment. Table 2 may be used as a guide in determining appropriate drench volumes needed for the specified pot sizes. For the grower who likes to apply BONZI as a known amount of active ingredient per pot, Table 2 also shows the amount of active ingredient found in a specific volume at a known concentration.

TABLE 2
DRENCH VOLUME GUIDELINES AND CONVERSIONS

Pot Diameter (inches)	Drench Volume (fl. oz./pot)	Mg. ai. BONZI/Pot			
		1 PPM	2 PPM	3 PPM	4 PPM
4"	2	0.063	0.125	0.188	0.25
5"	3	0.094	0.188	0.282	0.375
6"	4	0.125	0.25	0.375	0.50
8"	10	0.313	0.625	0.938	1.25
10"	25	0.783	1.56	2.35	3.125
12"	40	1.25	2.5	3.75	5.0

NOTE: The recommended drench volumes were based on the soil capacity of a common 6-inch 'azalea' type pot. Extrapolating the recommendation for this 6-inch 'azalea' type pot to smaller or larger containers may not be correct for total drench volume but should only be used as a guideline. The user must determine the appropriate rate and drench volume needed to achieve the desired result, based on both pot size and potting media used.

3. PREPLANT BULB SOAKS

Soaking of bulbs in solutions of BONZI is also a very effective way to attain height control. The rates used and length of soaking time will vary, depending on the species. See the section on BULB CROPS for specific recommendations.

FACTORS AFFECTING PLANT RESPONSE TO BONZI

IN ADDITION TO PROPER APPLICATION TECHNIQUE, THERE ARE SEVERAL ENVIRONMENTAL AND CULTURAL FACTORS WHICH CAN AFFECT A PLANT'S RESPONSE TO TREATMENT WITH BONZI. These factors may cause a variation in the amount of BONZI needed to provide desired plant height.

Cultural practices may affect the plant's response to BONZI. Plants which are grown at close spacing or in smaller pots and using high water and fertilizer levels may require an increase in the amount of BONZI needed.

For drench applications, plants grown in media with pine bark or a high organic content may require higher rates of BONZI than those grown in media without pine bark or with a low organic content.

Different varieties or cultivars within a given plant species may require a higher or lower rate of BONZI The taller, more vigorous varieties generally require more chemical than do the naturally short, less vigorous varieties.

Growers should consult with plant and seed suppliers for vigor and other growth characteristics for newly released varieties.

Temperature can be the overriding factor in determining the amount of BONZI needed. Stem elongation increases with increased temperatures. Growers in warm climates need to use higher rates and/or more applications compared to those in cooler climates.

The amount of BONZI needed and number of applications may also vary depending on the time of year, with higher rates and/or more applications needed during warmer months.

DETERMINING OPTIMUM RATES

Optimum BONZI rates will vary with different growers and will depend on their individual desired final plant height, growing conditions, and applications techniques. Different varieties or cultivars of the same species may respond differently to BONZI. Growers should conduct trials with small numbers of plants using the recommended rates to determine the optimum rates for their situations.

Before BONZI is applied to large numbers of plants, it is important that the user determine their own optimum rate for each species.

The rates recommended on this label are rate ranges and should be used only as a guideline.

The user should conduct trials on a small number of plants, adjusting the rate of BONZI to achieve the desired height and length of control. For preplant bulk soak trials, it may be necessary to adjust both the rate and length of soak time in order to achieve desired results.

For plant species listed on the label, the user should run initial trials using the lowest recommended rates.

For plant species not specifically listed on the label, the user should run initial trials using the rates recommended in Table 3.

TABLE 3
RECOMMENDED TRIAL RATES (ppm) BY GENERAL PLANT TYPE*

Plant Type	Spray	Drench	Bulb Soak
Bedding Plants	30	1	N/A
Bedding Plant Plugs	5	NR	N/A
Flowering/Foliage Plants (Annual or perennial)			
- Herbaceous Species	30	1	N/A
- Woody Species	50	2	N/A
Woody Landscape Plants	100	4	N/A
Bulb Crops	100	10	20 (@ 15 min.)

NR = Use is not recommended
N/A = Use is not applicable

* The recommended trial rates are based on information developed in the Sunbelt Region. Growers in regions north of the Sunbelt should run initial tests using ½ X the recommended trial rates listed in Table 3.

USE AND RATE RECOMMENDATIONS BY CROP

BONZI is effective in controlling the height of most ornamental crops. Be sure to read and fully understand the section on DETERMINING OPTIMUM RATES before applying to large numbers of plants.

A. AZALEAS (FLORIST)

BONZI can be used to control plant height, reduce bypass shoot elongation and promote flower bud initiation.

Spray applications are effective in the rate range of 100 to 200 ppm.

Drench Applications are effective in the rate range of 5 to 15 ppm. To control plant height and promote flower bud initiation, applications should begin when new growth, following final shaping, is 1½ to 2 inches long.

To reduce bypass shoot development, applications should be made after bud set when bypass shoots are barely visible, or about 5 to 7 weeks prior to cooling.

B. BEDDING PLANTS

Spray applications of BONZI will provide height control of most bedding plants at a wide rate range of 5 to 90 ppm. The rate ranges for some specific betting plants are:

Plant	Rate Range (ppm)	Plant	Rate Range (ppm)
Ageratum	15 - 45	Marigold (French)	15 - 45
Celosia	15 - 45	Pansy	5 - 15
Coleus	15 - 45	Petunia	30 - 60
Dahlia	15 - 45	Salvia	20 - 60
Dianthus	20 - 60	Snapdragon	45 - 90
Impatiens	15 - 45	Zinnia	15 - 45
Marigold (African)	30 - 60		

- Do not use on fibrous begonias as they are very sensitive to BONZI. Overly stunted plants can result if they receive spray drift from applications made to surrounding species.
- Do not use on annual Vinca (periwinkle) as BONZI may cause spotting of foliage, especially at high temperatures.

For bedding plants not specifically listed above, the user should determine optimum rates starting with a rate of 30 ppm in the Sunbelt Region and 15 ppm in the Northern Belt Region. Time of application should begin when new growth in height or width reaches 2 inches or when plants reach desired size to hold them at a marketable stage.

Late application timings and/or excessive rates may slow the growth of plants when transplanted.

High rates of BONZI may delay flowering, especially of impatiens.

Drench applications are effective on bedding plants, but are recommended only for those plants in containers 6 inches or larger. The user should determine optimum rates, starting at 1 ppm.

C. BEDDING PLANT PLUGS

Spray applications of BONZI can also be used to effectively control height of bedding plant plugs. The recommended rate range of 1 to 20 ppm is much lower than the rate range for older bedding plants.

Plant	Rate Range (ppm)	Plant	Rate Range (ppm)
Ageratum	5 - 10	Marigold	10 - 20
Celosia	5 - 10	Pansy	1 - 5
Coleus	5 - 10	Petunia	5 - 10
Dahlia	5 - 10	Salvia	5 - 10
Dianthus	5 - 10	Snapdragon	5 - 10
Impatiens	5 - 20	Zinnia	5 - 10

For bedding plant plugs not specifically listed above, the user should determine optimum rates starting with a rate of 5 ppm. Timing of application should begin at the 1 to 2 true leaf stage.

Drench applications are not recommended for bedding plant plugs due to the sensitivity and extremely low rates needed.

D. BULB CROPS

Height control can be achieved on a variety of bulb crops by any of the three application types.

Spray applications, although moderately effective, are the least desirable method for controlling height. Sequential applications are recommended in order to achieve desired uniformity. Applications should begin when plants are 2 to 4 inches tall.

Drench applications are very effective in the rate range of 8 to 160 ppm. Optimum rates vary widely, depending on species. Timing of application will also vary, depending on species. For bulbs which require a cold period, BONZI is generally applied 1 to 5 days after removal from the cooler. For most other bulb types, application should be made when newly emerged shoots are 1 to 2 inches tall.

Preplant bulb soaks are also very effective. Effective rates for most species are in the range of 5 to 25 ppm, with a soaking time of 15 minutes to 1 hour. In general, lower use rates will require longer soaking times.

The following table gives recommended rate ranges and length of soaking time for a variety of bulb species:

Bulb Type	Spray Rate (ppm)	Drench Rate (ppm)	Preplant Bulb Soak Rate (ppm) / Soak Time
Amaryllis	ND	200	ND
Caladium	100 - 200	10 - 20	ND
Calla Lily	ND	10 - 30	20 / 15 min.
Daffodil	ND	20 - 40	ND
Freesia	ND	ND	100 - 300 / 1 hr.
Hybrid Lily	250 - 500	10 - 20	20 - 30 / 15 min.
Montbretia	ND	ND	20 - 30 / 15 min.
Tulip	ND	5 - 40	2 - 5 /1 hr.

ND = Rates for this particular use have not been determined. For these applications the user should run trials using the rates recommended in Table 3.

For species not specifically listed, trials should be conducted using rates outlined in the section on DETERMINING OPTIMUM RATES.

E. CHRYSANTHEMUMS (POT)

BONZI is effective in controlling the height of pot chrysanthemums when applied as either a spray or drench.

Spray applications are effective at rates of 50 to 200 ppm. Applications should begin when axillary shoots are 2 to 3 inches long. BONZI can be applied earlier to vigorous varieties if additional control is desired.

Sequential applications of lower rates generally provide more uniformly shaped plants than single-spray applications.

BONZI may be applied at time of disbud to reduce late stretch without reducing flower size or delaying flowering.

Drench applications of BONZI are effective at recommended rates of 1 to 4 ppm. Application timing is when axillary shoots are 2 to 3 inches long.

Because pot chrysanthemums are usually planted with multiple cuttings per pot, uniform application is critical to achieving desired results.

F. FLOWERING PLANTS/FOLIAGE PLANTS (not specifically listed)

BONZI is effective as a spray or drench application in controlling height on a wide variety of other flowering plants and foliage plants. It can be used as either a holding agent to stop growth (e.g., interiorscape) or a toning agent to slow growth. In general, herbaceous

species will required lower rates than woody species. Trie should be conducted using rates outlined in the section on DETERMINING OPTIMUM RATES.

G. GERANIUMS

Geraniums are particularly sensitive to BONZI. The user must determine optimum rates before applying to large numbers of plants.

Spray applications of BONZI at recommended rates of 10 to 30 ppm will effectively control growth of geraniums. Early applications may require lower rates to avoid overstunting. Time of application for zonal geraniums is when growth is 1½ to 2 inches long; for seed geraniums, 2 to 4 weeks after transplanting or when needed.

BONZI will reduce late stretch when applied as the flower stems begin to elongate.

Drench applications, although effective, should be made with caution due to the extreme sensitivity of geraniums to BONZI. Trials should be conduced to determine optimum rates.

H. HIBISCUS

Spray applications at 30 to 150 ppm will effectively reduce shoot elongation. Application should be made when laterals are 1 to 4 inches long, depending on desired final plant size.

Single applications will control lateral growth for 3 to 6 weeks. Sequential applications may provide more uniform plant shape. BONZI can be applied 1 to 2 weeks prior to flowering to prevent late stretch.

Drench applications will also effectively reduce shoot elongation. Trials should be conducted using recommended rates outlined in the section on DETERMINING OPTIMUM RATES.

I. POINSETTIAS

Spray applications of BONZI will effectively control height of poinsettias. Recommended rates at 10 to 30 ppm for most areas of the U.S. In southern Florida, higher rates of 15 to 45 ppm are recommended.

Single applications may be made using the higher recommended rates. However, sequential applications initially using lower rates will provide better safety against overly retarded plants. For subsequent applications use 50 to 100% of the initial rate, depending on plant vigor at the time of reapplication.

Applications to slower growing varieties in cool climates should begin when axillary shoots are 2 to 3 inches long. For vigorous growing varieties in warm climates, applications should begin when axillary shoots are 1½ to 2 inches long. Sequential applications may be applied 1 to 3 times, at 7 to 14-day intervals, depending on plant vigor/growth.

Seasonably late applications of BONZI will reduce plant height, but, like most PGR's may also reduce bract size. For growers scheduling early December flowering, BONZI should

not be applied after initiation of short days. As a guide, do not apply BONZI after October 1 for areas outside of Florida, or after October 25 in Florida.

Drench applications generally have less of an effect on bract size than do sprays. Recommended rates are in the range of 2 to 4 ppm, based on a drench volume of 4 fl. oz./6-inch pot. Application should be made when axillary shoots are 2 to 3 inches long.

NOTE: Optimum BONZI rates and timings for both spray and drench applications to poinsettias will vary depending on the variety.

J. WOODY LANDSCAPE PLANTS (Container-grown in greenhouses/shadehouses)

BONZI is effective in controlling height on a wide variety of woody landscape plants using both spray or drench applications. Rate ranges for different species vary greatly. Trials should be conducted using rates outlined in the section on DETERMINING OPTIMUM RATES.

Examples of woody landscape plants on which the product can be applied are:

Azalea	Hydrangea	Magnolia
Bouganvilla	Ilex	Photinia
Camellia	Juniper	Pine
Euonymus	Ligustrum	Rhododendron

STORAGE AND DISPOSAL

PROHIBITIONS: Do not reuse empty containers. Do not contaminate water, food, or feed by storage or disposal.

STORAGE: Keep container closed when not in use. In case of spill or leak on floor or paved surfaces, soak up with sand, earth, or synthetic absorbent. Remove to chemical waste area.

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

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

CONDITIONS OF SALE AND LIMITED WARRANTY:

The Directions for Use of this product are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as timing and method of application, weather and crop conditions, mixture with other chemicals not specifically recommended or other influencing factors in the use of the product, all of which are beyond the control of the seller. All such risks shall be assumed by Buyer and User, and Buyer and User agree to hold Seller harmless for any claims relating to such factors.

Seller warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label, subject to the inherent risks referred to above, when used in accordance with directions under normal conditions of use. This warranty does not extend to the use of this product contrary to label instructions, or under abnormal conditions or under conditions not reasonably foreseeable to or beyond the control of Seller and Buyer and User assume the risk of any such use. SELLER DISCLAIMS ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING ANY WARRANTY OF FITNESS OR MERCHANTABILITY.

When Buyer or User claims losses or damages resulting from the use or handling of this product (including claims based on contract, negligence, strict liability or other legal theories), Buyer or User must promptly notify in writing Seller of any claims to be eligible to receive either of the remedies set forth below. The EXCLUSIVE REMEDY OF BUYER OR USER and the LIMIT OF LIABILITY of Seller will be, at the election of Seller, refund of the purchase price paid for product bought, or replacement of amount of product used. SELLER SHALL NOT BE LIABLE FOR CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT AND SELLER'S SOLE LIABILITY AND BUYER'S AND USER'S EXCLUSIVE REMEDY SHALL BE LIMITED TO THE REFUND OF THE PURCHASE PRICE.