GRANDPARENTS' DAY BUTTER CHURN BOUQUET — To commemorate the sixth annual Grandparents' Day in the United States, September 9, Teleflora is introducing a special arrangement, the Butter Churn Bouquet. It is a beautiful arrangement of cut flowers in a replica of an early American old-fashioned butter churn. The container is made of wood and has metal bands around it reminiscent of pewter. A decal adorns the front and is an example of Americana folk art.

WES CODDINGTON ELECTED TO SAF RETAILERS COUNCIL

Charles "Wes" Coddington, Kathleen E. Erickson, AAF, and Robert P. Sass, AAF, have been elected to serve three-year terms on the Retailers Council of SAF.

Wes Coddington is president of Coddington's Florist Inc. in Oneonta, N.Y. He has been a director, vice president and president of the New York State Flower Industries, Inc. He also has been chairman of FTD District 14C and a director of the Capitol District Teleflora Unit. Coddington has designed for many FTD and Teleflora shows, and many of his creations have won awards. A former funeral director, Wes is nearing his fortieth year of service to the floral industry, and is active in civic groups in his community.

1984 CORNELL POINSETTIA GUIDELINES FOR NEW YORK STATE

Prepared by the Cornell University Faculty and County Cooperative Extension Agents

Part 2 or a 3-part Series

POTS, GROWING MEDIA AND FERTILIZATION: White, hard-plastic pots have been reported to affect adversely the growth, but studies at Cornell showed no differences in growth and flowering of plants grown in dark green, white and crystal-clear pots.

Media for poinsettias range from peat-lite mixes to modified peat-lite mixes to amended soil mixes. Regardless of your selection, the media must be porous and well-drained, free from insects and diseases and have good nutrient holding and buffering characteristics. Steam sterilize or chemically fumigate soil and peat-lite mixes. Do not use an untreated medium.

If you prepare your own peat-lite mixes, be sure the amounts of material added are accurate. The quantity of trace elements called for appears to be a very small amount. Serious crop injury has occurred when higher rates of trace elements have been used. Likewise, poor crop quality results when the trace elements are left out of the mix. Make the mix yourself or assign a responsible employee to the job. Do not risk the loss of your crop on carelessness in the production process at this point.

Soil mix: Fertilizer additives required for a 1-1-1 by volume soil, peat moss and perlite medium vary, and the mix should be tested by a soils lab to determine what is required to optimize the nutrient levels.

Be sure the mix is prepared on clean surfaces. Proper mixing eliminates many cultural problems due to poor distribution of ingredients. Always fill containers with enough medium to compensate for settling upon watering. Allow enough reservoir for water to insure thorough wetting of the medium as well as to provide excess water for leaching purposes.

Fertilization: Poinsettias grow rapidly and require heavy fertilization whether grown in a soil mix or a peat-lite mix. Put another way, poinsettias are heavy "feeders." You can

not grow the plants in the early growing stages and then fertilize them heavily to green them up for sale. Fertility levels as determined by Spurway test procedures (Cornell Floriculture Soil Test Lab) should be maintained as follows:

Nitrates (NO_3)	40-60 ppm
Phosphorus (P)	6-10 ppm
Potassium (K)	40-60 ppm
Calcium (Ca)	150-200 ppm
pH	5.5-7.0
Total soluble salts (1 soil to 2 water)	less than 100 mhos in peat-lite mix

Fertilizing at Every Watering: Be sure superphosphate has been added to the soil or peat-lite mix before potting the crop. Use nitrate nitrogen fertilizers, especially if peat-lite mixes are the growing medium. Ammonium sources of nitrogen have caused severe problems with poinsettias. Commercially prepared 20-20-20 or 20-5-30 fertilizers and others may have a high ammonium nitrogen content and should not be used.

Fertilizing at every watering requires an application of excess solution to avoid soluble salt build-up in the pots. Use a 300 ppm N and 290 ppm K solution. This is prepared by mixing 10 oz potassium nitrate and 17 oz calcium nitrate in 100 gal of water. Do not use just calcium nitrate. Although vermiculite provides some potassium, there is not enough K present to carry the crop through to bloom. Include potassium nitrate to insure a quality crop. An alternative to the above is to use 15-0-15 'dark weather feed'. This is a nitrate-nitrogen fertilizer.

Begin fertilizer applications immediately after panning and continue until the plants are sold.

Fertilizing Once Per Week: This program requires a higher concentration of fertilizer. Use approximately 400 ppm N and 375 ppm K. Prepare by combining 14 oz of potassium nitrate plus 23 oz of calcium nitrate in 100 gal of water, OR use 15-0-15 'dark weather feed', at 36 oz per 100 gal of water.

Trace Elements: Trace elements are needed in very small amounts, but must be added to the media before planting the crop. A high quality crop of poinsettias can not be grown by depending on liquid feeding of trace elements alone from the standard commercial soluble fertilizers, expecially with plants in peat-lite mixes. Trace elements MUST be put into the original mix, followed by supplemental molybdenum during the growing period.

Growing Medium pH Control: Prior to the availability of benomyl fungicide, recommendations for control of Thielaviopsis root rot were steam pasteurization of the mix, a complete sanitation program and adjustment of growing medium pH to 5.0 to 5.5. To achieve this pH and still insure enough calcium for good plant growth requires substitution of 3 lbs. of gypsum for 3 lbs. of ground limestone. Benomyl soil drench does control Thielaviopsis root rot very effectively. If the disease continues to be a problem adjust pH to 5.0-5.5 AND use the benomyl drench: 50% at 1 1/2 lb/100 gal, applied at 1 pt/sq ft.

ENVIRONMENTAL CONTROL PRACTICES

Temperature: Proper control of temperature is still of prime importance in producing top-quality, well-timed poinsettias. Although research has shown that plants can be produced at lower than the usual 62-65 degrees F night temperature, plants grow slower and bract size is smaller at 60-62 degrees F and it is questionable whether the less showy product and extra bench time and labor costs for a slow-growing, low-temperature crop offset higher fuel costs.

General temperature recommendations are 65 degrees F nights and 70-75 degrees F days. Late propagations need warmer temperatures to make a holiday crop. Do not go over 80 degrees F at night, as this delays flowering.

For energy conservation, maintain 63-65 degrees F nights and 75-80 degrees F daytime during September and October when nights are not as cold as later. Then after the bracts have expanded, reduce night temperature to 60-62 degrees F, depending on how fast the crop is developing.

Many of the newer cultivars require cool finishing temperatures after the bracts have expanded for best quality plants. For the red and pink Hegg cultivars, finishing temperatures should be 57-60 degrees F nights and 65 degrees F days. White cultivars may develop greenish bracts at low temperatures. Eckespoint r 'C-1 cultivars must be finished at a night temperature of 65-67 degrees F during November and into December.

Mikkel Rochford cultivars produce excellent plants grown at the conventional temperatures. Do not attempt to grow Mikkel White Rochford or other white cultivars under low temperatures as the bracts will have a greenish cast. Minimum finishing temperatures for White are 60-62 degrees F.

Photoperiod: Under normal New York conditions flower buds initiate in late September when the daylength is about 12 1/4 hours. Poinsettias are extremely sensitive to artificial light at night. To prevent flowering use the same lighting as given for stock plants.

For an early (e.g. Thanksgiving week) crop of Hegg cultivars use black cloth from September 15 to October 10.

For a December 10 crop of Hegg cultivars, apply lights beginning September 1 until October 4, then use black cloth for two weeks to insure bud initiation; or delay the flower development by lowering temperature in November.

For a normal Christmas crop of Hegg cultivars, apply lights beginning September 1 until October 10, then use black cloth for two weeks to insure bud initiation.

For plants scheduled to flower early (for Thanksgiving week) or late (December 20), through photoperiod control, adjust dates of propagating and pinching backward or forward to assure an ideal finished plant size.

DO NOT USE LIGHTS to delay bud set on late cultivars such as Eckespoint r 'C-1'. Do not allow the plants to be exposed to any unwanted light sources: street lights, parking plaza lights, heavy traffic or freeways. Extraneous light delays flowering.

Light Intensity: Natural light levels in fall greatly influence crop growth and timing. By mid-October the glass should be thoroughly cleaned to permit maximum light to reach the crop.

Pot Spacing: Don't crowd the crop! Quality plants are produced through adequate spacing, starting as soon as the crop is panned and in the final production location.

Water: Poinsettias need a lot of water for maximum growth. Avoid overwatering. Never let the pots dry out completely as desiccation injury and root damage occur. When fertilizing at every watering, apply enough extra to get some leaching. This avoids salt buildup.

Semi-automatic watering methods are more thorough than hand watering at a considerable saving of labor. Various multi-tube systems have been successfully adapted to poinsettia production.

Capillary mat watering has been successfully used by some growers. This is a method of crop irrigation based on soil physical principles. It provides an uninterrupted supply of water to plants resulting in their rapid growth. It is recommended you try the system on a small number of plants before committing your entire crop. Your county Cooperative Extension Agent can provide you with details for constructing a capillary bench.

GROWTH RETARDANTS: Cycocel (CCC) and ancymidol (A-Rest) are the growth retardants most often used on poinsettias as either a drench or foliar spray. B-9 SP is labelled for cultivars no longer widely grown and does not retard the newer cultivars reliably enough to be used.

Cycocel Soil Drench: Use 1 qt of Cycocel (11.8 %) in 40 qts (10 gal) of water and apply uniformly

Treat August propagations in early to mid-September; do not treat plants growing in 2 1/4" and 3" pots after September 15. Early-treated 2 1/4" and 3" pots may require a second treatment after final potting. Do not treat after October 15. Apply only to plants that have established a well-developed root system. Several applications made at lower concentrations yield the most satisfactory results. Before using Cycocel extensively, obtain experience in small-scale trials.

Cycocel Foliar Application: Foliar applications are usually easier to make and are preferred by the grower. More plants can be treated in a given period of time than by the drench method. For maximum absorption of the growth regulator, spray in early evening or when relative humidity is high.

Make the first application when the breaks after the pinch are about 1" long; this usually is about 2 weeks after the pinch. Spray with a dilution of 1 to 80 (1 qt cycocel to 20 gal of water) or 1 to 60 (1 qt cycocel to 15 gal of water). Make a second application of either solution 10-14 days later. If growth continues more rapidly than desired, additional applications of either solution can be made at 10-14 day

intervals, but apply growth retardant no later than the end of October. Yellow leaf margins may develop but will disappear as the leaves grow. Be sure to use a wetting agent such as DuPont wetter sticker, Orvus, Ortho X-77 or Triton B1956 at 1/8 tsp. per gal of diluted solution to get maximum coverage.

A-Rest Drench: A-Rest is recommended for use only as a soil drench. Follow label instructions completely for best results. Treat plants at pinch to 4 weeks after pinching, or 8 to 12 weeks prior to finishing the crop. Indications are that cultivars vary in response to A-Rest. You may have to try a range of concentrations to determine the most effective to use.

A-Rest Foliar Application: One to several 10-25 ppm sprays of A-Rest (4.8 to 12.1 fl. oz./gal) effectively control poinsettia stem elongation, but this method of application is not label-approved.

DISEASE PREVENTION AND CONTROL: Keeping a clean house is the key to disease prevention. Constant attention to detail eliminates many problems attributed to disease. Train your employees to think clean at all times. As a manager you should know the principles of disease control and explain them to your employees. Delegate the disease control program to a responsible employee. Prevention of disease costs less than control in terms of time, labor and crop losses.

During panning and potting: Use new pots. Steam or chemically disinfect soil and mixes. Sterilize potting benches by brushing off loose soil particles and then drenching the surface with chlorine bleach at a 1:10 dilution. In production areas, use Captan-Terraclor-Ferbam drench (1 1/2 lb of each /100 gal) on all benches, or paint benches with copper naphthanate (Cuprino., etc.). In your root rot management program, Lesan, Truban, Banrot or Subdue are effective against Pythium; Genlate, Topsin M, Banrot or Terraclor will help to control Rhizoctonia and Thielaviopsis.

Seven to ten days after panning, use a drench of Banrot at 6 oz/100 gal to control a range of root rot pathogens. There are several good alternatives: Benlate (8 oz/100 gal) PLUS EITHER Subdue 2E (0.5 oz/100 gal) OR Lesan (8 oz/100 gal). Lesan may also be used in combination with Terraclor (4 oz/100 gal). Apply these materials at a rate of 1/2 pint per 6" pot, so that 100 gal will treat 1600 6" pots. Terraclor treatment should not be repeated; other fungicides may be repeated monthly.

Be sure to use a light mix with good drainage properties, to encourage healthy root growth and discourage root rot fungi.

Botrytis cinerea is the common gray mold which can become a problem on poinsettias. The disease occurs under conditions of cool temperature, free moisture and the presence of Botrytis spores. The best control is prevention: apply heat and ventilate at sunset to keep humidity down and avoid condensation on the plant surfaces. Fans in the house to keep air circulating help to prevent problems due to Botrytis. Control may be achieved with Exotherm Termil. When used at temperatures above 75 degrees F, some injury has been reported on 'Mikkel White', 'Paul Mikkelsen' and 'Eckespoint C-1'. Treat when foliage and bracts are dry and temperature is below 70 degrees F and will remain there during treatment. Fungicide sprays are very likely to injure bracts, so environmental control is very important in the finishing stages of the crop. Prior to bract development, sprays of Chipco 26019, Ornalin or Daconil 2787 may be used to supplement environmental control measures.

INSECT AND MITE CONTROL: Sanitation is an important element in any insect control program. Weeds growing within or adjacent to the greenhouse may serve as resevoirs for insect pests, providing a constant source for reinfestation. Discarded plants, plant parts or organic growing media may also attract or harbor destructive pests, and should be removed from the growing area (not directly adjacent to the geenhouse). Other effective procedures, especially for preventing or managing whitefly infestations, are suggested as follows.

1. Prevent whiteflies from being introduced into the greenhouse. Examine cuttings or new stock for the presence of whiteflies before adding to the existing crop.
2. Learn to recognize the first signs of whitefly infestation. Inspect the undersurface of the young foliage from time to time.
3. Treat when the first signs are noticed, not delaying until

clouds of adults can be flushed out of the plants.

Generally, the greenhouse whitefly is the most prevalent and serious pest. Mealybugs, spider mites and fungus gnats also may be troublesome on occasion. Brief descriptions of these insects and their damage follow.

Whiteflies. The whitefly life cycle is complex, consisting of a number of different stages, some of which are highly tolerant to insecticidal treatment. The duration of the cycle is from 30-45 days. Since each female is capable of depositing about 400 eggs in her lifetime, infestations may build rapidly and overlapping of stages is common. The leaf undersurface is the preferred feeding site. The plants become chlorotic and may drop their leaves prematurely. In addition, "honeydew" excretions serve as a substrate for the growth of a sooty fungus which gives the plant a blackened, unattractive appearance. The fungal growth also interferes with photosynthetic activity. Given the fact that insecticide-tolerant stages become increasingly prevalent as an infestation develops, frequent and regular treatment is necessary until all immature stages have developed to maturity and none of the tolerant stages remains.

Spider Mites: These minute, insect-like relatives also congregate on the undersurface of the leaves. They are able to complete a generation in as few as five days during hot, dry periods. As in the case of the whitefly, the two spotted spider mite also passes through distinct stages, some of which are tolerant to insecticides. Since development during favorable growing conditions is rapid, it may be necessary to make multiple applications at closely timed intervals (4-5 days). Feeding damage is evident as chlorotic specking and yellowing or bronzing of the foliage. Heavy feeding may result in the death of the plant. During the initial stages of an infestation, mites may be detected by shaking the plant or sharply rapping the leaves over a sheet of white paper. The mites will be evident as minute, moving specks. Silken webbing scattered throughout the foliage signals the presence of a sizeable population.

Mealybugs. The presence of fluffy white, waxy secretions is a sure sign of mealybug infestation. Generally, during early attack, these cottony puffs are confined to the leaf axils and other sites on the plant where they are less apt to be noticed. The eggs of the species most common to this growing region are protected within a mass of irregular cottony secretions. Upon hatching, the young crawlers (nymphs) disperse throughout the plant, and may occasionally be found feeding on the roots. The crawler stage is most vulnerable to insecticidal treatment. Damage results from the injection of toxic saliva into the plant tissue as the insect extracts the fluid contents from the cells by means of its sucking mouthparts. As with the whitefly, there is considerable "honeydew" produced upon which the sooty fungus grows. Leaf drop and distorted growth is not unusual when populations are high.

Fungus Gnats. The adult is a slender, delicate fly which may be observed flitting among the plants or running rapidly over the surface of the growing medium in the pots. Large adult populations may be a nuisance to greenhouse workers. The immature stage (larva) is white and legless, with a conspicuous black head. Adults are attracted to moist organic matter such as the potting mixes used in plant production. The females lay their eggs in clusters of 20 or more on the surface or in crevices of the potting medium or in any other organic matter which may be present in the greenhouse

environment.

The larvae feed on rootlets and roots and may burrow into the lower stem promoting decay and collapse of the tissue. Wilting will be evident as the injury progresses. A period of approximately 4 weeks is required for completion of the life cycle from egg to adult. Applications of insecticidal granules, or drenches, may be needed to protect against larval feeding. Foliar sprays, aerosols or smokes will control the adults.

Control: The insecticides which are listed will provide control if applications are well timed and sufficient in number. Initiate the program early and maintain plants free of infestation during early plant development because the bracts are more sensitive to pesticides after they begin to color, and the choice of safe, effective insecticides is more limited. If treatment is necessary after bract coloration, it should be restricted to the use of aerosols of resmethrin (SBP-1382), dichlorvos (DDVP), dithio or acephate (Orthene). Label directions must be adhered to closely, or plant damage may occur. In the following list, insecticides proceded by the notation (R) are restricted-use chemicals which may be applied only by a certified pesticide applicator.

Acephate
(Orthene 75% SP) - 2 tsp/gal.
(PT 1300 3% aerosol) - Use as directed on label. Use 2-3 times at 7-10 day intervals. Controls whitefly, mealy bug, spider mites.

*(R) Aldicarb (Temik 10% gran) - Apply to the soil after the plants are well rooted. Do not mix with potting soil. Spread evenly over soil surface and gently water surface so as not to wash granules out of the pot. Repeat treatment if needed bu in no case, within 4 weeks of marketing Do not let the plants dry out or injury may occur. Use any of the following treatments: For whitefly-- 18-28 oz/1000 sq ft of closely packed pots; For mealybug and spider mites-- 28-37 oz/1000 sq ft. Or for individual pots: 4-6" use 1/16 tsp.; 8-10" use 1/8 tsp.; 12" use 1/4 tsp.

*Special note: Aldicarb (Temik) is not cleared for use in Suffolk County.

Cyhexatin (Plictran 50WP) - 3/4 tsp/gal for spider mites.

(R) Dichlorvos
(DDVP, Vapona 10% aerosol) - 1 oz/3000 cu ft.
(4EC): vaporize 1 oz/10,000 cu ft on pipes or in pan. Make multiple applications at 4 day intervals; foliage dry, vents closed 2 hours or overnight. Controls whitefly, mealybug, spider mites, fungus gnat adults.

Hexakis (Vendex 4L) - 1 tsp/gal for spider mites.

Fluralinate (Mavrik, 2 EC) - 2/3 to 1 2/3 tsp/5 gal. Controls whitefly, spider mites.

(R) Oxamyl (10% gran) - in soil mix, add 3 oz/cu yd while tumbling. As post planting pot treatment, water in. For 4-6" pot size, use 1/16 tsp; for 8-10" pot size, use 1/8 tsp. Controls whitefly, mealybug, fungus gnat larvae.

Pentac
(50WP) - 1 tsp/gal
(4 flow) - 2/3 tsp/gal. Treat every 7 days until spider mites are controlled.

Resmethrin
(SBP-1382, 2 EC) - 1 tsp/gal weekly for 4-6 weeks.
(PT 1200, 1% aerosol) - use labeled rates, good for late season control. Controls whitefly, fungus gnat adults.

(R) Sulfotepp
(Dithio 5% aerosol) - 1 lb bomb/50,000 cu ft.
(15% smoke) - use labeled rates. Treat at 7 day intervals. Foliage dry. Vents closed for 2 hours or overnight. Controls whitefly, mealybug, spider mites, fungus gnat adults.

Sumithrin
(1% aerosol) - follow label directions.
(2 EC) - 1 tsp/gal for whitefly; 2 tsp/gal for mealybug, spider mite. Apply weekly.

Additional control suggestions may be found in Cornell Recommendations for Commercial Floriculture Crops Part II: Pest Control - Diseases, Insects and Weeds. Follow label directions closely.

NEW YORK STATE FLOWER INDUSTRIES, INC.

nysfi

August, 1984

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