



Production Notes > **Dracaena Production Guide**

CFREC-A Foliage Plant Research Note RH-91-14

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DRACAENA

Dracaenas comprise one of the most important and diverse families sold as foliage plants. Available in many different varieties, leaves can be oval or lance shaped and from 3 to 24 inches long. The leaves vary in color from emerald to grey green, sometimes with white or yellow stripes or yellow or cream spots. They range in size from small tabletop varieties to plants 20 feet tall.

Dracaena fragrans (Corn Plant) and its cultivars are one of the most popular dracaena groups and considered among the best of interior plants. Most potted corn plants are sold as standards, plants with multiple heads on a cane with lengths varying from 6 inches to 5 feet. Often three or more canes of differing length are planted in a single pot. Corn plant is also very attractive when potted as a single cutting in a 5 to 8 inch pot. Corn plant gets its common name from its upright growth and graceful leaves which resemble corn foliage.

Dracaena fragrans, the species, is entirely green and although it is an excellent plant, most consumers prefer the more colorful cultivars. *Dracaena fragrans* 'Massangeana' is the most popular cultivar and has leaves with a broad yellow central stripe. This cultivar accounts for nearly 90% of the corn plants sold. Two other attractive cultivars that are found in the marketplace are *Dracaena fragrans* 'Lindenii' with white marginal stripes and *Dracaena fragrans* 'Victoria' with golden marginal stripes.

The two dracaena cultivars, 'Warneckii' and 'Janet Craig', are derived from the species *Dracaena deremensis* Engl. 'Warneckii' is a stiff, erect variety with gray-green leather-like leaves striped with white. 'Janet Craig' has long shiny dark green leaves more flexible than 'Warneckii'.

Dracaena marginata Lam., known as the Madagascar Dragon tree or Red-edge dracaena, is indigenous to the island of Madagascar. The Madagascar Dragon tree has been a popular foliage plant for many years because of its distinctive appearance. The stems are woody, erect and the long, narrow, sword-like leaves clasp the stem in a closely stacked fashion. The dark green glossy leaves are trimmed with a narrow, dark red margin. Leaves on large plants may exceed 18 inches in length, and old plants may be 10 feet high from soil level. *Dracaena marginata* is available from Florida nurseries in containers ranging from 3-inch square pots up to specimens in containers 52 inches across. The dark green cultivar accounts for most of the plants sold, however, there are two cultivars worth mentioning. 'Tricolor' has longitudinal ivory stripes through the central green area and red margins. 'Colorama' is similar to 'Tricolor' except there are red and ivory bands in the central sector of the leaf. Because the variegated cultivars have less chlorophyll than the species, they are less vigorous during production and less likely to succeed indoors, except in very bright locations. The plant is used as a medium to large size shrub in southern Florida and is reliably hardy in Zone 10B, where the average minimal temperature range is 35 to 40°F.

Dracaena sanderana, sometimes called the Ribbon plant, is a small, 4 to 5 inch, dracaena. It has graceful

green lanceolate leaves with white marginal stripes on an upright stem. The plant is frequently used in dish gardens. *Dracaena borinquensis* is a small stiff robust dracaena. Leaves have a light center stripe and green margins. Gold dust dracaena, *Dracaena godseffiana*, a spreading shrubby plant, has elliptic green leaves with many small cream colored spots on wiry stems.

PROPAGATION

Dracaenas are propagated commercially by vegetative methods. *Dracaena marginata* and its cultivars are propagated from cuttings or, in a few instances, air layers are used on relatively large stems. Most small dracaenas are started from terminal cuttings with foliage to the base. Very large cuttings and layers generally have exposed stems at the base. Plants can be propagated from cane sections, but are rarely done so because of the undesirable branching angle of shoots from the upper portion of cane. Most propagation material used by Florida growers comes from the Caribbean Basin and Central America, although a few nurseries in south Florida maintain stock plants of *D. marginata* in full sun. Cuttings placed in small pots are usually plunged to the bottom to insure support. Cuttings and layers used in larger containers are set slightly above the base to provide a better environment for root development.

Semiwoody canes and tips of 'Massangeana' are shipped to the U.S. for propagation. Upper ends are usually dipped in wax to prevent desiccation. Cane survival rate can vary from 50 - 100% depending upon care during, and after, harvest. Cane should be handled as though it is a leafy cutting. Removing a small portion of the base of the cane before placement of cane in the propagating medium allows for better water uptake. Dracaenas respond favorably to rooting hormones and use of rooting substances is considered desirable by most nurserymen using unrooted cuttings. However, tests have shown IBA powder to be ineffective with *D. deremensis* 'Compacta' and detrimental to *D. marginata* 'Colorama' and *D. surculosa* 'Florida Beauty.' A 50 parts per million (ppm) soak for 18 hours of IBA improved 'Massangeana' bud break. Dracaenas root and grow best when temperatures range between 75 and 90°F.

PRODUCTION

Potting media used for growing dracaenas should be free from pests, well drained and moisture retentive. Small plants grow well in a mix composed predominately of organic components. Larger plants growing in shadehouses should have a heavier mix, often composed of 10 to 20% sand, to prevent wind toppling. The potting medium should be adjusted to a pH range of 6.0 to 6.5 prior to sticking or potting plants. Elevating pH levels above 7.0 has been shown to cause iron deficiencies. Media should be amended to include a moderate level of micronutrients such as 1 lb of Micromax/yd³. Avoid use of micronutrient blends which contain excessive boron and superphosphate which contains fluoride. Fluoride (F), not an essential element, can induce leaf chlorosis of dracaenas. It is found in some irrigation water, soil mix ingredients and fertilizers, especially superphosphate. Keeping the Ph above 6.0 will usually prevent F toxicity.

To maintain growth through cool periods, temperature in the production structure should be held above 65°F. Suggested air temperatures for best growth range between 65 and 90°F. For maximum production, root zone temperature should be between 75 and 80°F. If air temperatures exceed 90°F chlorosis of 'Janet Craig' and notching of 'Warneckii' will occur. The chlorosis appears to be iron deficiency, but additions of iron will not prevent the chlorosis. At soil or air temperatures less than 65°F, very little growth will occur. Plants will be damaged at 35°F air temperature if exposed for short periods, 1-2 days, or if exposed to 55°F for 1 week. To simply protect the plants from cold damage, a minimum of 50°F should be held and plants should be sheltered from wind. Temperatures below 50°F, but above freezing, have been observed to cause chilling damage when plants are exposed to wind.

Light levels can strongly affect appearance of dracaenas, especially the variegated cultivars. Suggested shade level for 'Marginata' and 'Massangeana' is 63 to 73% (about 3000 to 4000 ft-c), which produce 'Massangeana' with good contrast between the yellow and green portions of leaves. Best production light level for 'Warneckii' and 'Janet Craig' and the small dracaenas is 2000-3500 ft-c, or about 70-80% shade.

High light will decrease area of the white stripe on 'Warneckii' and Sanderana and increase leaf necrosis.

In many instances, the small sized dracaenas, usually 6-inch diameter pots and less, are grown in greenhouses along with a mixture of other plants which grow best at light intensities in the 2000 to 3000 foot candle range. Under such conditions, the plants will be somewhat less vigorous and the leaves will be more pendulous. Plants grown above 4000 ft-c probably will not survive well when placed indoors as plants grown at lower light levels.

'Massangeana', 'Warneckii' and 'Janet Craig' should receive a fertilization regime of 7 g nitrogen per square foot monthly from a 3-1-2 (N-P₂O₅-K₂O) ratio fertilizer or the equivalent of 7 grams of a 19-6-12 fertilizer applied at three month intervals to a 6" pot. Marginata should receive slightly more fertilizer, about 10 g per square foot monthly. Other dracaenas should receive about 8 g nitrogen monthly or 5 g of a 19-6-12 per 6" pot every 3 months. During periods of heavy rainfall, the monthly fertilization rates should be increased to compensate for excessive leaching. Tissue composition of good quality dracaenas is found in Table 1.

Table 1. Tissue composition (% dry weight) of good quality Dracaena.

	N	P	K	Ca	Mg
'Janet Craig'	2.0-3.0	0.2-0.3	3.0-4.0	1.5-2.0	0.3-0.6
'Warneckii'	2.5-3.5	0.1-0.3	3.0-4.5	1.0-2.0	0.5-1.0
'Massangeana'	2.0-3.0	0.1-0.3	1.0-2.0	1.0-2.0	0.5-1.0
Godseffiana	1.5-2.5	0.2-0.3	1.0-2.0	1.0-1.5	0.3-0.5
Sanderana	2.5-3.5	0.2-0.3	2.0-3.0	1.5-2.5	0.3-0.6

F content of 50 parts per million ppm was found in healthy 'Janet Craig', and 100 ppm found in necrotic plants. Healthy 'Warneckii' had only 35 ppm and necrotic plants had 75 ppm F.

Plants can tolerate low soil moisture, but best growth is obtained if plants are not subjected to drought conditions.

Dracaenas do not appear to be influenced greatly by growth retardants.

SHIPPING

Dracaenas can be shipped satisfactorily for 2 weeks at temperatures of 60-65°F, and except for 'Florida Beauty' should lose very little quality if kept for 4 weeks. Exposure to 15 parts per million (ppm) ethylene for 24 hours had no effect on *Dracaena marginata* or *sanderana*, and would probably not affect other dracaenas.

INDOOR ENVIRONMENT

'Warneckii' and 'Janet Craig' remain attractive under light levels as low as 50 foot-candles (ft-c), but 100-150 ft-c is preferred.

PHYSIOLOGICAL PROBLEMS

MARGINATA

1) Chilling injury

Symptoms

- Chilling for several hours at 32 to 37°F without air turbulence will result in chlorotic or necrotic bands across several leaves. Slight constriction or irregularity of the leaf surface is usually associated with the banding. These symptoms are not evident for 2 or more weeks because damage occurs inside the terminal sheath of leaves and foliage must elongate first.

Control -

Avoid chilling plants during production, handling, and shipping.

2) Phytotoxicity from excesses of soluble salts, fluorides, or boron.

Symptoms -

Chlorosis and usually necrosis of terminal portion of leaves. Symptoms are similar for the 3 types of injury and are a complex of 2 or more types of toxicity.

Control -

Excess soluble salts can be prevented by following recommended fertilizer rates. Periodic solubridge meter readings of potting media are suggested to monitor fertility levels. Fluoride phytotoxicity usually arises when superphosphate or other phosphorous sources containing fluorides are used in the fertilizer program. Avoid use of these products as well as water supplies high in fluoride. Adjust potting media to pH 6.0-6.5 and avoid other factors which contribute to rapid fluoride accumulation in the foliage such as high temperatures, bright light, low humidity, and wind. If fluoride phytotoxicity is from fluoride particles suspended in the air (one type of air pollution), little can be done except grow plants with more resistance to fluoride injury. Boron also accumulates in the terminal and marginal areas of the leaf where "burn" is observed. Avoid using fertilizer products with high levels of boron. Remember, boron is an essential element for plant growth and therefore should be present in the plant in very small amounts. If the potting medium and water supply are essentially boron free, a **small** amount should be added as part of the fertilizer program.

3) Tip distortion

Symptoms -

Disfigured new growth of *D. marginata* has been observed in several south Florida nurseries. The problem is often severe when present and does not appear to be pathogenic or nutritional in origin, although some plants have responded to applications of copper.

Control -

Not known yet

4) Flecking

Symptoms -

Newest leaves have scattered white to yellow spots that are most common near the apex in *D. marginata*. As the leaf matures these spots usually turn green, but marketability is reduced when plants are severely spotted. No plant pathogens have been isolated from the spots.

Control -

The problem is most severe in high light and low temperatures and decreases as percent shade is increased. Plants grown under 2000 ft-c or less often have no spotting while full sun grown plants often have spotting.

MASSANGEANA

Reference Pest Control Guides [Here](#)

1) Leaning canes

Symptoms -

Canes become loose in pots causing plants to be unsalable and sometimes damaged. This often occurs during shipping.

Control -

Growers have approached the problem of loose or leaning canes in several ways: 1) Utilizing a potting medium that packs securely around canes; 2) Shipping with a spacer between multi-cane plants to prevent movement and 3) Inducing rooting further up the cane as well as at the base to provide additional support.

2) Fluoride toxicity

Symptoms -

On 'Massangeana' the first indication is a mottled loss of pigmentation within the green area, most easily observed from undersides of leaves. With time, these areas become chlorotic and then necrotic, often progressing to the point that the leaf margin is damaged. On 'Lindenii' and 'Victoria', the problem appears mainly in the white or golden margins and is first observed as necrosis. This problem on these two cultivars often limits their usefulness.

Control -

Potting media should have a pH of 6.0 to 6.5 to control fluoride availability. Care must also be taken to use water and fertilizer sources that do not contain fluoride.

3) Flowering

Symptoms -

Plants produce sprays of light lilac flowers. As the sprays are terminal, they result in loss of the terminal meristem and cause a cessation of growth until side nodes break. This usually ruins the plant's appearance.

Control -

Flowering appears related to cool temperatures in the fall or early winter, especially where minimum night temperatures are near 45°F or below for several weeks. Observation indicates that 7 to 14 cool nights in a row will probably initiate flowering. We suggest maintenance of 55°F or higher to prevent flower formation.

4) Small heads

Symptoms -

Canes break poorly and only produce 1 to 2 heads per cane.

Control -

Use only fresh cane or pre-sprouted cane of good quality. Generally, small thin canes and thick old canes produce the lowest number of sprouts. Poor sprouting also occurs when canes have been in storage or transit too long.

5) Wind burn

Symptoms -

Leaves develop a water-soaked or grayish area along leaf margins which turns brown or black after several days. Leaves most likely to be damaged are the newest developed leaves.

Control -

Keep plants away from wind whenever temperatures are lower than 50°F. Short durations as low as 35°F are usually safe, provided plants are protected from all wind, as in a closed greenhouse. In windy areas, plants can be partially protected by wind breaks or heating.

6) Shipping leaf breakdown

Symptoms -

Although plants appear normal at time of shipping, leaves may be severely chlorotic or even necrotic several days later when they are unpacked. The pattern of damage is primarily a wide marginal band, but can also occur within the leaf blade.

Control -

The cause is still not fully known, but the following suggestions should reduce severity of this problem: 1) Grow plants under suggested light and fertility regimes (plants from high light and receiving heavy fertilization are usually most severely injured); 2) Water plants several days before shipping, but not within the last day or two before packing. Recent research has shown that plants not watered for up to a week before shipping may be damaged least, provided the potting medium does not become dry.

WARNECKII and JANET CRAIG

Reference Pest Control Guides [Here](#)

1) Fluoride toxicity

Symptoms -

Elongated tan to dark brown areas form first in the white tissue of 'Warneckii', then progress to marginal necrosis. 'Janet Craig' tips and margins have chlorotic and necrotic areas.

Control -

Maintain pH between 6.0 and 6.5. Avoid water, medium components, and fertilizers containing fluoride. Dracaenas are also very susceptible to aerial fluoride pollution.

2) Tip chlorosis

Symptoms -

New growth a general light green to yellow color.

Control -

Frequently, this is due to high pH, 7.5-8.0, which results in iron chlorosis. Use iron spray and reduce pH with sulfur or acid fertilizers.

3) Notching ('Warneckii')

Symptoms -

Base of leaves appear to be cut by knife. Serrations are perpendicular to long axil of leaf, 1/8 to 1/2 inch deep.

Control -

Caused by high temperatures. Maintain maximum temperature of 90°F. High fertilization will also promote notching.

BACTERIAL PROBLEM

Reference Pest Control Guides [Here](#)

1) Soft rot (*Erwinia carotovora* pv. *carotovora* and *E. chrysanthemi*)

Symptoms -

Stem ends of unrooted and sometimes rooted cuttings are mushy, brown and frequently smell like

rotted fish. The ends are wet and disintegrate rapidly under the warm, moist conditions of rooting beds. A bacterial slime is sometimes present. Infection commonly extends into the lower leaves and causes their discoloration and collapse. If the ends of infected stems are cut, a darkened vascular system may be present.

Control -

The practice of recutting infected plants to remove rotted portions does little to diminish losses of cuttings. Sometimes cuttings will root only to become symptomatic and rotted at a later date. Dipping asymptomatic cuttings appear to decrease losses when copper or streptomycin products are employed. The only way to eliminate this disease is to reject all cuttings with these symptoms.

FUNGAL PROBLEM

Reference Pest Control Guides [Here](#)

1) Fusarium leaf spot and stem rot - (*Fusarium moniliforme*)

Symptoms -

Fusarium leaf spot symptoms occur initially on the newest leaves of the plant which are within the central whorl. Infection only occurs when this whorl is very wet and spores are present. Lesions are irregularly shaped, tan to reddish brown and many times have a chlorotic (yellow) border. Under conditions of high disease pressure and continually wet foliage, the lesions coalesce and infection spreads into the plant meristem. Stem rot often occurs on cuttings during mist propagation. Symptoms are identical to those caused by Erwinia and culture of the pathogen is required to differentiate the two diseases. If plants are treated with fungicides and the foliage kept dry, growth in the center may resume, frequently from several buds. The creamy-orange spores of the pathogen are commonly produced in leaf or stem lesions under wet conditions and splashing water spreads them onto other plants.

Control -

Keeping the foliage of this plant dry can eliminate the foliar phase of this disease. If this is not possible, use one of several fungicides to diminish symptom expression. Soil drenches may decrease the stem rot phase on these plants.

INSECT AND RELATED PROBLEMS

Reference Pest Control Guides [Here](#)

The major arthropod pests of 'Warneckii' and 'Janet Craig' include fungus gnats, mealybugs, scales, and thrips. Mealybugs and scale infestations are typically the result of bringing infested plant material into the production area. Fungus gnats and thrips have the ability to fly and thus can invade from weeds and other infested plants. In the control section for each pest, a few of the many registered and effective pesticides will be listed. For a complete listing, please consult the references at the end of this report.

1) Fungus gnats

Symptoms -

Fungus gnats are small black flies (1/8 inch long) and are frequently observed running around the soil surface or on leaves and are often confused for Shore flies (see later section). The adults have long bead-like antennae and their legs hang down as they fly. These insects are very weak fliers and appear to "flit" around randomly. The larvae are small legless "worms" with black heads and clear bodies that inhabit the soil. The larvae spin webs on the soil surface which resemble spider webs. Damage is caused by larvae feeding on roots, root hairs, leaves in contact with the soil and lower stem tissues. Feeding damage may predispose plants to disease and they are often found in close

association with diseased plants or cuttings. Adults do not cause any direct damage, but are responsible for many consumer complaints to growers. Adults emerge and fly around in retail shops, homes, or offices and are therefore a nuisance. For further information please consult Extension Entomology Report #74. (Management of fungus gnats in greenhouse ornamentals).

Control -

Reduce the amount of water applied to each pot where possible. Avoid algae growth where possible. Soil drenches or soil-surface sprays are effective at controlling the larvae. Nematodes that seek out insects in the soil are sold commercially and have been shown to control these pests without causing any negative effects to the host plants. Adults are very sensitive to most chemicals.

2) Mealybugs

Symptoms -

Mealybugs appear as white, cottony masses in leaf axils, on the lower surfaces of leaves and on the roots. Honeydew and sooty mold are often present and infested plants become stunted, and with severe infestations, plant parts begin to die.

Control -

Systemic materials are preferred. Control of root mealybugs is accomplished with soil drenches with an insecticide. When pesticides are applied to the soil, care must be taken to assure that the pots have good drainage and that no saucers are attached, or phytotoxicity may result.

3) Scales

Symptoms -

Infested plants become weakened or stunted and begin to die. Scales can be found feeding on leaves, petioles, or stems. They are usually distinct from the plant material on which they are feeding. Their shape (round to oval), size (pinpoint to 2 mm long), and color (light to dark brown) are quite variable and many scales are hard to distinguish from the plant material on which they are feeding.

Control -

See Mealybugs

4) Shore flies

Symptoms -

Shore flies small black flies (1/8 inch long) and are frequently observed sitting on the tips of leaves or on the soil surface feeding on algae. The adults have very short antennae. These insects very strong fliers and exhibit directed flight (straight between 2 points). The larvae inhabit the soil and are small legless "worms" with clear bodies and no obvious heads. No known damage is caused by larvae. This insect is believed to feed only on algae. Adults do not cause any direct damage, but may be responsible for spreading plant pathogens, reducing value by defecating on the leaves (small black to green spots) and for many consumer complaints to growers. Adults emerge and fly around in retail shops, homes, or offices and are therefore a nuisance.

Control -

Reduce the amount of water applied to each pot where possible. Avoid algae growth on walkways, benches, and cooling pads. Chemicals are not believed to be very effective in the control of this pest.

5) Thrips

Symptoms -

Thrips are small (less than 1/20), thin insects. Adult thrips can be identified by a long fringe of hair

around the margins of both pairs of wings. Color varies between species with western and other flower thrips being yellow to light brown and banded greenhouse thrips and a few other thrips that feed mainly on leaves being dark brown to black. Feeding takes place with rasping type mouth parts. Infested leaves become curled or distorted, with silver-gray scars or calloused areas where feeding has occurred. Thrips can transmit the tomato spotted wilt virus to many different ornamentals. Any unusual symptoms should be investigated.

Control -

Many materials are registered and effective at controlling thrips.

Pesticides should be applied according to label directions.

Regardless of the pesticide or mixture of pesticides used, it is strongly recommended that the effects be evaluated on a few plants, under your particular conditions before treating all plants.

Mention of a commercial or proprietary product in this paper does not constitute a recommendation by the authors, nor does it imply registration under FIFRA as amended.

Reference Pest Control Guides [Here](#)

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