Success with Ornamental Peppers

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Ornamental peppers make an excellent niche plant for spring sales for the landscape or fall and winter holiday production. The wide assortment of fruit colors and shapes make them an exciting addition to any greenhouse production program. Ornamental peppers are easy to grow and the production tips listed below may help fine your growing program.

Cultivars

There are over 30 cultivars of ornamental peppers available. Many of the older cultivars like 'Filus Blue' or 'Bolivian Rainbow' are tall growing and make excellent background plants in the landscape. Since 1991, plant breeders at the USDA in Beltsville, MD have been working with ornamental peppers and have released a number of new cultivars. This includes a number of compact cultivars which are excellent for container or border plants. Some of the newer cultivars even have fruits that are not hot, like Pan American Seed Company's 'Medusa'. Additional information about 17 cultivars of ornamental peppers that were trailed at North Carolina State University is at: *www.floricultureinfo*. Some of the outstanding cultivars from the trials include: Jigsaw, Starburst, Masquerade, Pretty Purple, Treasures Red, Marbles, and Medusa.

Scheduling

Plants can be sold "green" 8 to 10 weeks after sowing or when the peppers have colored after 15 to 20 weeks. Crop time is usually 2 to 3 weeks shorter during the summer production.

Seeding

Germination takes from 7 to 12 days at 70-75°F. Seeds can be sown in plug trays and transplanted into the final container within 15 to 20 days after sowing. Avoid letting plugs become root bound in the plug tray before transplanting, as restriction of root growth can stunt and stall the crop.

Containers

The most common container used for finishing is a 5-inch pot with one plant per pot. With all the possible variations in leaf color, fruit shape, and growth habits, the uses of ornamental peppers are only limited by your imagination. Larger containers also make a colorful display with 3 plants per 6-inch pot or mum pan or a larger specimen plant in a patio container. Some growers also produce 1801 cell packs for spring sales. This works especially well for the purple or variegated foliage cultivars where they can be easily differentiated by the consumer from the peppers used in the vegetable garden.

Root Substrate (Medium)

An ideal mix should allow for rapid root development, while maintaining good water-holding capacity. Mixes that stay too moist may cause shoot growth to become weak and chlorotic due to the lack of oxygen in the substrate and increase the chances for root rot. Peat based mixes with large perlite or pine bark are good choices to provide ample water retention and drainage.

Irrigation

Ornamental peppers are not very forgiving of water stress and repeated wilting can lead to lower leaf loss, fruit drop, and a poor quality crop. Drip or sub-irrigation should be used to prevent the foliage staying too wet which can promote *Botrytis*. If hand irrigating, consider morning irrigations to allow the foliage to dry during the day to avoid the occurrence of *Botrytis* or root rot.

Nutrition

Ornamental peppers are moderate feeders. High levels ▶

of phosphorus (P) and ammoniacal-nitrogen (NH_4-N) (> 40% of total N) and/ or urea in a fertilizer mix should be avoided to prevent excessive stem elongation. Ornamental peppers will become soft and leggy with excessive fertilizer.

Water quality will affect which fertilizers to use. If your irrigation water is alkaline, use a 20-10-20 or similar acidic formulation to aid in pH management. If your irrigation water has low alkalinity, consider using a 13-2-13 Cal-Mag or similar basic formulation to aid in pH management. Weekly rotation of an acid and basic fertilizer can be a useful tool to ensure proper pH balance for the crop.

Once the cotyledons protrude from the germination substrate, the first fertilization to the plug tray can be made. For the seedling stage, fertilize at a rate of 50 to 75 ppm of N with a constant liquid feed. Once the plants are established, the recommended fertilization rates are between 150 and 200 ppm N (constant liquid feed).

Plants have a moderately high requirement for Ca and Mg. If these two elements are not supplied in irrigation water, then it needs to be supplied through fertilization. The used of calcium nitrate or the Cal-Mag fertilizer formulas will provide adequate Ca. To supply Mg, monthly applications of epsom salts ($MgSO_4 \cdot 7H_2O$) should be made at the rate of 1 to 2 lbs. per 100 gallons of water.

The root substrate pH and electrical conductivity (EC) should be monitored on a weekly basis because of the potential of salt accumulation and/ or the development of high or low pH values. The pH range should be between 5.8 and 6.2. Low pH will cause the lower leaves to develop dark purple spots. EC levels should be maintained between 0.5 to 1.0 mS/cm for the 2:1 extraction method, 1.0 to 2.0 mS/cm for the saturated paste extraction method, or 1.5 to 2.8 mS/cm for the PourThru extraction method. Excessively high fertility rates can be detrimental to fruit set.

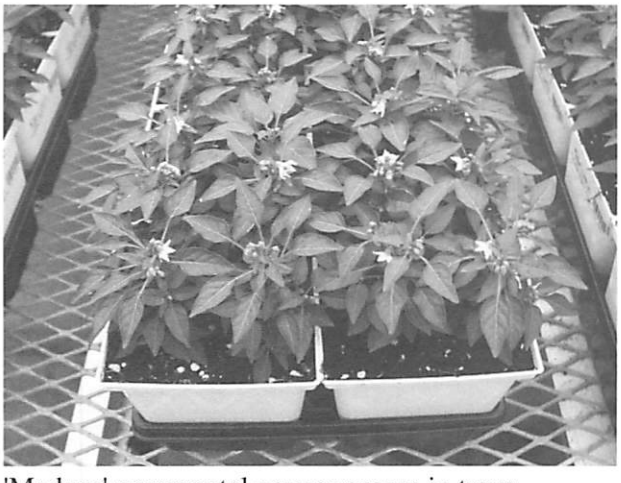
Temperature

Once established, temperatures should be around 75°F during the day and 65°F at night. Avoid temperatures below 45°F or chilling injury can occur. Temperatures above 85°F during fruit set (and magnified if nutrient levels are excessive) can result in crop delay because of flower/fruit abscission.

Height Control and Pinching

Tall cultivars of ornamental peppers will require pinching or plant growth regulators (PGRs) to maintain compact growth. Taller cultivars can be soft pinched 6 to 8 weeks after sowing. Pinching results in bushier plants, but may increase the crop time by 2 weeks. Pinching of the compact cultivars like Medusa is not recommended because it results in a clumpy appearance.

There are a number of PGRs that are suitable for use on ornamental peppers. ***PGRs can only be used on plants used for ornamental peppers not consumed.*** Sumagic foliar sprays can be applied around 8 to 10 weeks after sowing at the rate of 10 to 15 ppm for taller cultivars or 5 to 10 ppm for medium-sized cultivars.



'Medusa' ornamental pepper grown in trays.

Three plants per pot make an attractive 8-inch container.

Bonzi also controls plant height of ornamental peppers. Research at NC State University found that a Bonzi foliar spray at 20 ppm was comparable to Sumagic at 10 ppm on 'Pretty Purple' pepper. Bonzi also had the advantage of not reducing the number of fruits on each plant, while the use of Sumagic resulted in a 36% decrease in fruit number.

B-Nine at 2,500 ppm can also be used for medium-sized cultivars. Compact cultivars may not require any PGRs. The above rates were determined in the Southeast U.S. for a crop maturing during the late summer. Rates should be adjusted for other locations and times of the year.

Earlier research at the University of Georgia found that Florel at 150 to 300 ppm promotes earlier red and orange fruit coloration of ornamental peppers, although Florel is not registered for ornamental peppers. Our trials at NC State University found that foliar sprays of 150 ppm applied 3 to 6 weeks after flowering hastened red fruit coloration by 2 to 3 weeks. A sufficient number of fruits must be near mature size prior to applying Florel. Florel applications will cause all flower buds and some of the small fruit to drop. Rates higher than 300 ppm can even result in large fruit drop.

Major Insect/Mite Pests

A number of insect pests can attack ornamental peppers. The major ones include aphids, spider mites, and thrips. Aphids can be controlled with foliar sprays of Endeavor, Horticultural Oil, Insecticidal Soap, Marathon, Orthene, or Thiodan. Akari, Avid, Floramite, Hexygon, Floramite, Ovation, Pylon, or Sanmite are all potential controls for spider mites. Thrips will feed on the immature leaves which will cause leaf distortion and the fruit which results in a whitish appearance. Control thrips with Avid, Conserve or Mesurol.

Major Diseases

The most common diseases of ornamental peppers are *Botrytis*, impatiens necrotic spot virus (INSV), and *Pythium*. *Botrytis* or gray mold commonly occurs during wet conditions accompanied with poor airflow. Drip, sub-irrigation, or hand irrigation in the morning, along with good air movement will help avoid this problem. Daconil Ultrex, Decree, Dithane, or Kocide will help control *Botrytis*.

INSV appears as a dark, greasy stem lesion or a dark ringspot on the leaves. The disease is spread by western flower thrips and once the plant is infected, it needs to be discarded. Western flower thrips control is required to control this disease.

Pythium root rot can occur if the soil is kept too moist. Managing the irrigations so that the substrate is not excessively wet will help avoid problems. Possible controls for *Pythium* include Aliette, Subdue Maxx and Terramaster. ***The pesticides listed above can only be used on plants used for ornamental peppers not consumed.***

Post-Production Care

Temperatures can be decreased to 60 to 65°F nights and 65 to 70°F days to help prolong fruit quality. Low light conditions can result in fruit drop and exposure to ethylene during shipping should be avoided.

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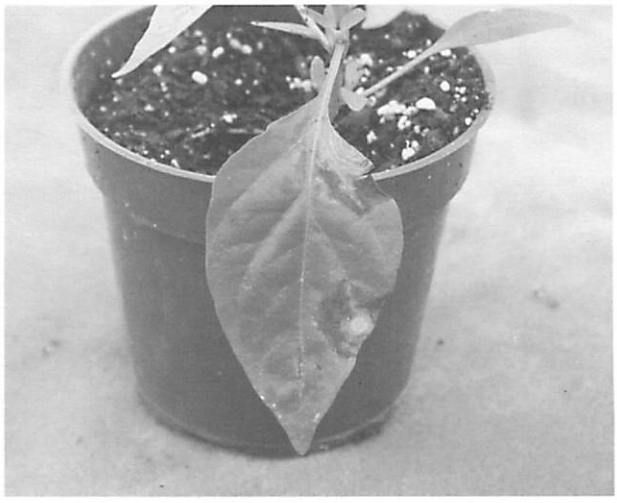

INSV can be a major concern with ornamental peppers.