



Florida/Holland/Israeli Ruscus Production and Use¹

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FAMILY: Liliaceae

GENUS: *Ruscus*

SPECIFIC EPITHET: *hypophyllum*



Figure 1. *Ruscus hypophyllum* is an extremely durable cut foliage crop. Credits: Robert H. Stamps

Ruscus hypophyllum (Figure 1) is called Florida/Holland/Israeli ruscus because it is produced commercially in Florida and Israel (also Columbia and the Middle East) and sold at the Dutch auctions. This durable member of the lily family is an evergreen semiwoody ground cover native principally to northwest Africa, but is probably also native to southern Spain. *R. hypophyllum*, which is related to the numerous *Asparagus* species that are also popular cut foliages, has semi-glossy, dark green, thornless "leaves" that are actually stem modifications called cladodes or cladophylls. *R. hypophyllum* has upright, branchless stems, up to 3 feet [1 m] in height, and elliptic to ovate cladodes, up to about 3 inches [8 cm] long and 1 1/2 inches [4 cm] wide in size. *R. hypophyllum* is sometimes incorrectly labeled as *R. aculeatus* (Butcher's broom), which has smaller, spiny cladodes and freely branched stems. *R. hypophyllum* is typically dioecious (plants are unisexual, with separate male and female plants). Flowers are produced in the center of the cladodes and may be on the upper and lower surfaces. The fruits (berries) are bright red and about 1/2 inch [1.3 cm] long.

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Floral Design, Landscape and Interiorscape Uses

Floral Design Use

R. hypophyllum stems make good line (linear) materials in floral arrangements. In addition, *R. hypophyllum* can be used as a filler element and as a Christmas green, especially if its red berries are present. *R. hypophyllum* can be used dried or fresh and is extremely durable—for example, stems harvested in mid-December and stored at 40°F [4°C] have been successfully used in arrangements as long as five months later. Israeli ruscus foliage is available year-round.

Landscape Use

R. hypophyllum can be used as a ground cover in the landscape, especially in shaded locations. Other species of ruscus (*R. aculeatus*, *R. hypoglossum*) can tolerate competition from tree roots and drought, and experience in Florida indicates that *R. hypophyllum* is similarly tolerant.

Interiorscape Use

R. hypophyllum has potential for use as an indoor ground cover, but research is needed to determine optimum interior light and fertilizer levels for this crop.

General Cultural Requirements

R. hypophyllum can be grown successfully in containers or in the ground; however, production in pots seems to reduce the incidence of bacterial leaf spot caused by *Pseudomonas andropogonis* (see diseases, bacterial, in common cultural problems section).

Fertilizer: In an experiment at the Mid-Florida Research and Education Center - Apopka, plants growing in 8-inch [20-cm] containers responded with increased stem numbers and total stem weight as fertilizer rates were increased. The 17N-6P₂O₅-12K₂O [17N-2.6P-10K] fertilizer (Sierra, Grace/Sierra, Milpitas, CA 95035) was applied every two months at 0.18, 0.35 or 0.53 ounce [5, 10, or 15 grams] per container. Stem production was increased 19% and 32%, and total weight of

stems was increased 24% and 37% by the medium and high fertilizer rates, respectively, compared to the low rate. However, average stem weight and vase life were not affected by fertilizer rate.

Light: *R. hypophyllum* does best under shade. Heavy shade produces fewer but longer stems, with larger cladodes than lower shade. Ten percent more stems were produced under 50% compared to 70% shade, but the average weight of stems produced under the two shade levels was not different.

Planting: *R. hypophyllum* plants appear to transplant well if they are of sufficient size at the time of planting. Israeli extension agents suggest that plants should be grown in 6-inch [15-cm] pots before they are planted in the field. Limited observations in Florida indicate that small plants transplanted into the field generally develop quite slowly, although they do become established and eventually grow into producing plants.

Propagation: Traditionally, asexual propagation of *R. hypophyllum* has been by division of the underground rhizome. Vegetative buds on the rhizomes will develop into plants and this method of propagation helps assure that propagules will have the characteristics of the original plant. More recently, this crop has been propagated using tissue culture, a newer asexual method. *R. hypophyllum* can also be propagated by seed.

Soil: *R. hypophyllum* thrives in moist, loamy soils but tolerates a wide variety of soils and soilless growing media. In an experiment conducted under shadehouse conditions, yield (on a fresh weight basis) was 12% higher from pots containing a Florida sedge peat:builders' sand mix (3:1, volume:volume) than from those containing a commercial soilless container mix. The difference in yield may have been due to the greater water-holding capacity of the peat:sand mix and might have been eliminated if watering had been more frequent for plants in the commercial mix.

Temperature: *R. hypophyllum* will tolerate a wide range of temperatures; however, immature stems may be damaged if temperatures drop below freezing and mature stems may be injured during severe freezes. In addition, *R. hypophyllum* will not

produce new stems if it does not experience cool temperatures in the fall or winter.

Water: Ruscus (at least *R. aculeatus* and *R. hypoglossum*) are reportedly tolerant of both wet and dry conditions.

Common Cultural Problems

Pests: Undoubtedly this list will increase with time as more and more of this crop is produced in Florida.

Insects:

Scale (*Pseudaulacaspis cockerelli*, formerly known as *Phenacaspis natalensis* and *Phenacaspis cockerelli*, has been identified as feeding on *R. hypophyllum* in Florida (Figure 2). According to Florida Department of Plant Industry records, other scale species — *Aspidiotus spinosus*, *Chrysomphalus aonidum*, and *Ischmaspis longirostris* — have been identified on other species of ruscus and closely related genera.)



Figure 2. False oleander scale (*Pseudaulacaspis cockerelli*), also known as magnolia white scale, on Florida/Israeli/Holland ruscus. Credits: Lance S. Osborne

Symptoms - False oleander scale, a.k.a. magnolia white scale, feeds on ruscus cladodes and stems. Adult females are white, waxy and pear-shaped, with the narrow end brown. Preadults are oval and yellowish to orangish. Adults often line up along or near major veins in the cladodes.

Control - Systemic materials are preferred because it is difficult to penetrate the waxy outer coating of the scale. Few materials control false oleander scale and fewer still are labeled for use on ruscus. Interestingly, oil and soap sprays have been effective if applied properly and repeatedly. Some biological control agents, e.g. fungi, that have been tested for control of this pest have not been able to force their way under the waxy armor.

The following notes provide information from other countries regarding insect interactions with plants closely related to *R. hypophyllum*. This knowledge may be useful in the future.

Note 1: In a study designed to find potential insecticides for controlling the **caterpillar** (larvae) of *Spodoptera littoralis*, it was found that *R. hypoglossum* was highly toxic to *S. littoralis*. In fact, mortality of larvae feeding on this *Ruscus* species, which is closely related to *R. hypophyllum*, was 100%. *S. littoralis* is related to the beet armyworm (*S. exigua*), a common and difficult to control pest on many crops in Florida.

Note 2: The black vine **weevil** (*Otiorrhynchus sulcatus*), which does not presently occur in Florida, is a troublesome pest of Italian "ruscus" (*Danae racemosa*) in Italy. It was found that two commonly used insecticides with ornamental labeling, acephate (Orthene) and chlorpyrifos (Dursban), provided effective control of this insect pest.

Diseases:

Bacterial -

Leaf spot/blight (*Pseudomonas andropogonis*)

Symptoms - Small, water-soaked spots start on cladodes and stems and rapidly expand into large areas up to 1/2-inch [1.2 cm] in diameter; spots are reddish brown with water-soaked, frequently chlorotic margins (Figure 3).

Control - Keep foliage as dry as possible by using cultural practices that avoid the use of overhead irrigation, irrigate when the foliage will dry most rapidly, and protect the foliage from rain. Compared to growing plants in the ground, production of this crop in containers seems to reduce, but not eliminate,

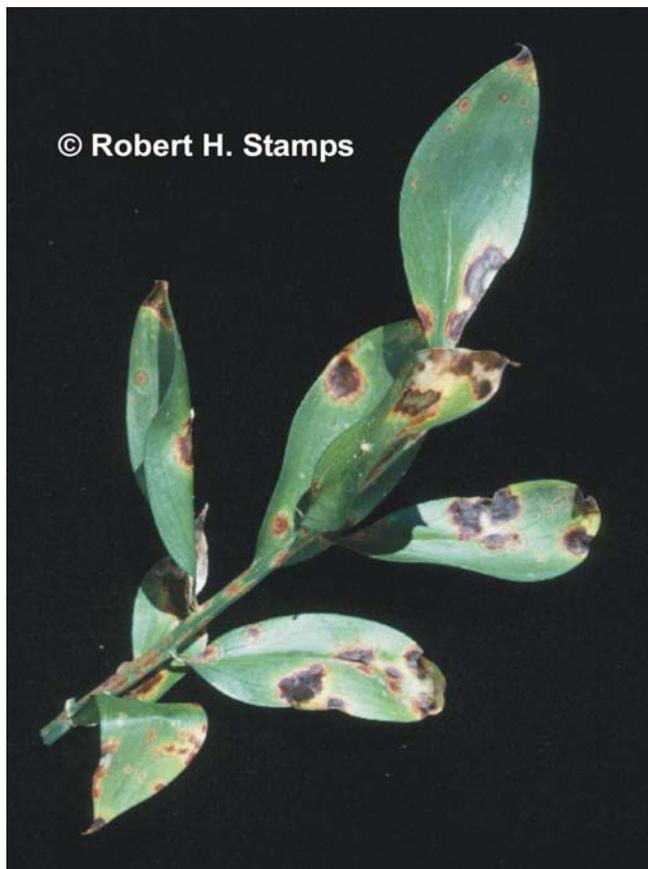


Figure 3. Bacterial leaf spot caused by *Pseudomonas andropogonis* starts as small, water-soaked spots that can rapidly expand to large reddish-brown blemishes with water-soaked, chlorotic margins. Credits: Robert H. Stamps

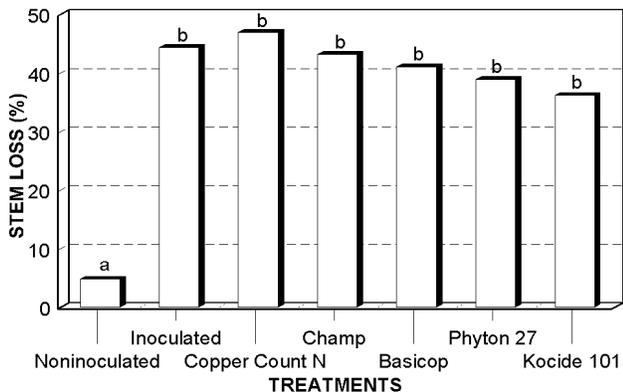


Figure 4. Copper compounds had no effect on percentage of *R. hypophyllum* stems damaged by *Pseudomonas andropogonis*. Graph bars sharing any letter are not different ($P = 0.05$).

the incidence of this disease. In addition, copper-containing compounds and antibiotic sprays may be of some help. However, in a recent test of five copper compounds, the percentage of stems made unsalable due to damage by *P. andropogonis*

was the same for copper-treated plants as for untreated control plants (Figure 4). In addition, this pathogen and the crop (*R. hypophyllum*) are not on the label of many of these products. Growers should be aware that the repeated use of copper compounds may lead to high enough levels in the soil to damage the plants.

Fungal -

Leaf spot (*Cercospora* spp.)

Symptoms - Water-soaked lesions, irregular necrotic spots.

Control - Keep foliage as dry as possible by using cultural practices that avoid the use of overhead irrigation, irrigate when the foliage will dry most rapidly, and protect the foliage from rain. Sanitation, i.e. removal of infected foliage, may help. In addition, fungicides labeled for controlling *Cercospora* may be helpful.

Harvesting and Postharvest Considerations

Harvesting and Handling: Ruscus stems are harvested with clippers and are frequently bundled ten per bunch using rubber bands. Stem lengths are generally in the range from 30 to 45 cm [10 to 18 inches]; however, longer stems can be produced if desired.

Yield: Yield estimates from Israeli extension personnel have been as high as 1,482,600 stems•ha⁻¹•yr⁻¹ [600,000 stems/acre/year]. However, data from Israel put that number at 681,818 stems•ha⁻¹•yr⁻¹[276,500 stems/acre/year]. This average, of course, would include both acreage not yet in full production and some that was old and possibly exhibiting declining production.

Storage and Shipping: Restorage and shipping of this crop is encouraged. Stems will hold for months in waxed corrugated fiberboard containers at temperatures around 4°C [40°F].

Vase life: Typically, stems of Israeli ruscus and closely related species will last in arrangements for a month or longer. Combinations of 8-hydroxyquinoline citrate (a microorganism

inhibitor) and sucrose (an energy source) used as holding solutions for *R. hypoglossum* have been shown to be of little or no benefit. In addition, the use of either one alone has been demonstrated to decrease vase life of *R. hypoglossum*.

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