

ZZ plant is an easy tough indoor use

By Matthew Blanchard and Roberto Lopez

ZZ plant, *Zamioculcas zamiifolia*, is becoming more popular as an indoor plant because of its glossy, dark-green foliage, limited disease and insect problems and performance under low light and restricted water availability. In 2002, the Florida Nursery, Growers & Landscape Association named the ZZ plant a Florida Plant of the Year.

The ZZ plant requires a relatively long growing cycle and high temperatures to produce a marketable crop. For the past several years, researchers at Michigan State University have been investigating how to efficiently produce this plant.



A ZZ plant is good for interiorscapes because of its glossy leaves, limited pest problems and performance under low light.

Characteristics

Native to East Africa, the ZZ plant is hardy in USDA Hardiness Zones 9b-11 and reaches 2-3 feet tall and 3 feet wide. The plant produces a short, yellow-brown flowering spadix at its base, but the flowers are not showy.

Beneath the soil, the ZZ plant produces round rhizomes that function to store water. The formation of these rhizomes makes it an interesting plant to propagate because they often develop during the rooting of vegetative cuttings.

The ZZ plant can be propagated vegetatively either by division or cuttings. Because division requires a grower to begin with several large stock plants, this propagation method is often impractical. With this in mind, we focused on using vegetative cuttings.

Study results from MSU

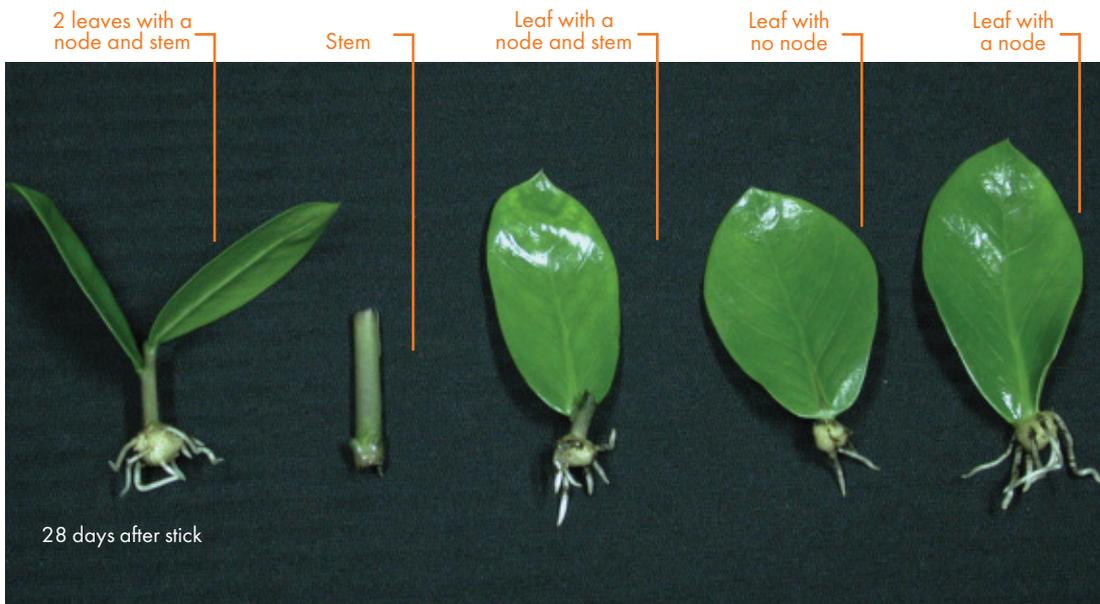
Best type of cuttings. The goal of one of our studies was to determine the best type of vegetative cuttings that would root and produce the greatest number of rhizomes during propagation. Five types of cuttings were harvested from stock plants: two leaves with a node and stem;

choice for

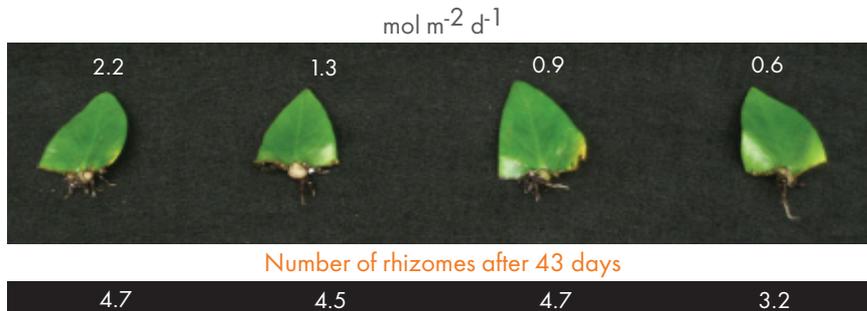
Zamioculcas zamiifolia survive most interior environments.

Effect of cutting type on rooting and finishing

CUTTING TYPE



Effects of daily light integral during propagation



ZZ plant is best propagated using apical leaf cuttings under a 16-hour photoperiod and a minimum daily light integral of 2 moles per square meter per day.



Greenhouse Carts

- **Standard cart sizes in stock**
(US & CAN, please call to check availability)
- **Custom made sizes**
(up-on request)
- **High standard quality**
(at affordable prices)
- **Superior maintenance free wheels**
- **Also available: budget carts**
(competitively priced)



In stock:
new heavy duty carts & shelves

22" x 59"

44" x 46"

Contech div. West Coast
11160 Mc Sween rd
Chilliwack BC V2P 6H5
Canada
t. +1 604-792-9947
f. +1 604-792-6558

Contech div. Ontario
R.R.2. 1214 Concession 7 Rd.
Niagara On The Lake
ON, Canada L0S 1J0
t. +1 905-684-0600
f. +1 905-684-0683

info@contechinternational.com | www.contechinternational.com

▲ Request 52 ▲

internode (stem); leaf with a node and stem; leaf without a node; and leaf with a node.

Cuttings were propagated in 72-cell plug trays filled with 50-percent commercial peat and 50-percent screened coarse perlite mix. The air and bench temperature set point of the propagation environment was 79°F with a natural photoperiod.

Four weeks after sticking, all leaf cuttings with or without stems or a node rooted and produced one large rhizome. Stem cuttings did not callus or root.

Rooted cuttings were transplanted into 4-inch pots and grown at 90°F under a 16-hour photoperiod provided by high-pressure sodium lamps. After 16 weeks, plants propagated from two-leaf cuttings with a node and stem were slightly larger than the one-leaf cuttings.

More than one cutting. Another study was conducted to determine if more than one cutting could be obtained from a single leaf. This could potentially reduce the number of stock plants needed for cutting production. Leaf cuttings were harvested and horizontally cut across the middle. The top portion of the leaf (apical cutting) and the bottom portion (basal cutting) were stuck approximately 0.5 inches into the propagation medium. Four weeks after sticking, apical leaf cuttings produced more (three to five) small rhizomes than basal leaf cuttings, which produced one large rhizome.

Impact of photoperiod. One study determined if rooting or rhizome development was influenced by photoperiod during propagation. Apical, basal and full leaf cuttings were stuck in propagation chambers under 9- and 16-hour photoperiods. Rooting and rhizome number were determined five weeks after sticking.

Both photoperiod and cutting type (apical or basal) influenced the number of rhizomes that developed. Apical leaf cuttings consistently developed more rhizomes than basal leaf cuttings, regardless of photoperiod. The greatest rhizome number (3.9) occurred when apical leaf cuttings were propagated under a 16-hour photoperiod. Full-leaf cuttings developed three rhizomes regardless of photoperiod.

Daily light integral influence. Daily light integral (DLI) is the quantity of light received each day and is expressed as the number of moles of light received per square meter per

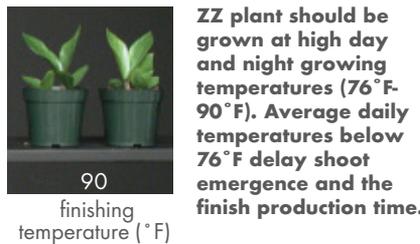
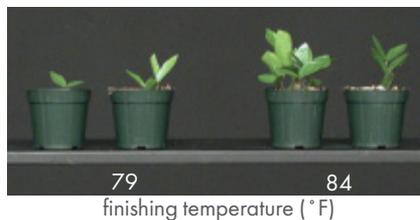
day ($\text{mol m}^{-2} \text{d}^{-1}$). To determine the effect of daily light integral on rooting, apical and basal leaf cuttings were propagated under four different woven shade curtains (0, 30, 50 and 70 percent shade). This provided four different daily light integral environments, ranging from 0.6 to $2.2 \text{ mol m}^{-2} \text{d}^{-1}$.

After six weeks, apical leaf cuttings propagated under a daily light integral of 0.9 to $2.2 \text{ mol m}^{-2} \text{d}^{-1}$ produced an average 4.6 rhizomes compared to only 3.2 rhizomes when cuttings were rooted under a daily light integral of $0.6 \text{ mol m}^{-2} \text{d}^{-1}$.

The ZZ plant is best propagated using apical leaf cuttings under a

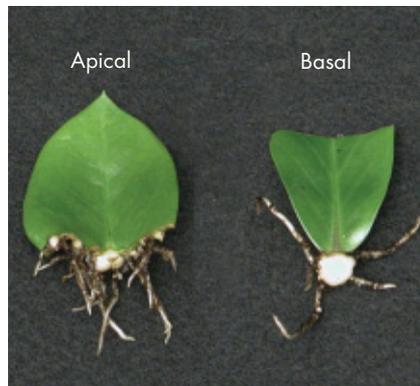
Effect of leaf cutting type and finishing temperature on production

17 weeks after transplant



ZZ plant should be grown at high day and night growing temperatures (76°F - 90°F). Average daily temperatures below 76°F delay shoot emergence and the finish production time.

CUTTING TYPE



HANGING BASKETS | NURSERY | PATIO PLANTERS

NEW!
Clover containers



THE BEAUTY OF PREMIUM MOLDED FIBER:

SUPERIOR PLANTS

Savvy growers use Western's premium fiber to grow bigger, more robust plants that bring higher prices and delighted customers. Our performance-engineered containers grow healthier plants, while saving water and reducing shrinkage.

Positively impact your bottom line. Talk to your distributor today or contact Western for a distributor near you.



800.547.3407
sales@westernpulp.com



- BRASS EYELETS & NYLON HANGER
 - Exclusive nylon hanger is extra-strong.
- HEAVY DUTY DESIGN
 - Industry-leading quality
 - Premium molded fiber
- ENGINEERED TO BREATHE
 - Fully wax-permeated
 - Microporous and breathable
- SUPERIOR INSULATION
 - Virtually eliminates channelling
 - Keeps roots warm in winter, cool in summer

Cut-away view of the 12XLRD-II Hanging Basket

▲ Request 87 ▲

\$Winning Combinations\$



Pat. No. 4573809

•**E-Z Seeder** - Quality at a low price. Accurate and fast - plugs or cells - single or cluster. Seeds raw petunia, tobacco, marigolds and most others. 120 to 300 flats per hour.

•**Germination Chamber** - Better and more uniform germination.

•**Dibble Board** - For seeding or transplanting, a must have.

SEED E-Z SEEDER, INC.

1116 Peachtree Drive
Lake Placid, FL 33852
800-448-9371

Phone or Fax: 863-699-6281
http://www.sezsdr.com
email tesch@sezsd.com

▲ Request 88 ▲

There's no mystery... about the **AquaFog CRSM™**

- ULV greenhouse chemical fumigation
- Treats 3,000 - 30,000 sq. ft.
- Simple set-up, unmanned operation
- 0-5 GPH adjustable fogging output
- Arrives fully assembled ready to operate
- Made in USA

AquaFog mystifies the competition; but don't let CRSM's affordable price tag fool you, these powerful, compact units can fumigate small to large greenhouses fast. The pivoting fogging head allows you to propel the vapor way-up high for superior coverage and circulation.

1-888-889-4407
www.jaybird-mfg.com

Jaybird

▲ Request 89 ▲

Effect of cutting type and photoperiod on rhizome development during propagation

Apical half leaf
Photoperiod: 9 hours, 16 hours
No. of rhizomes: 3, 3.9
Basal half leaf
Photoperiod: 9 hours, 16 hours
No. of rhizomes: 1.3, 1.3
Full leaf
Photoperiod: 9 hours, 16 hours
No. of rhizomes: 3, 3

16-hour photoperiod and a minimum daily light integral of 2 mol m⁻² d⁻¹. During propagation, maintain an air and bench temperature set point of 75°F-85°F and a light intensity of 1,000-1,500 foot-candles. Overhead misting and steam or fog should be used to maintain high relative humidity (90 percent).

Production guidelines

After propagation, plugs should be transplanted into 4- to 6-inch pots filled with a commercial peat-based medium. When finishing a 4-inch crop, plant one rooted cutting per pot. Larger pot sizes require additional plugs.

A new shoot emerges from the medium 40-50 days after transplant at average daily temperatures of 79°F-84°F. The number of new shoots that emerge from each leaf is related to the number of rhizomes at transplant. In our studies, leaf cuttings that developed five rhizomes during propagation initiated a similar number of new shoots two to three months after transplant. As shoots develop and new leaves unfold, the existing rhizomes enlarge and additional smaller rhizomes are formed.

One of the most important requirements for producing the ZZ plant is providing a warm day and night growing environment, in the range of 76°F-90°F. Average daily temperatures below 76°F will delay shoot emergence and the finish production time. The production time for 4-inch plants grown at 84°F is six to eight months. Larger pot sizes or cooler production temperatures lengthen the growing time. Produc-



Plant Disease Diagnostics

Accurate and Thorough

Quick Turnaround (usually in one week)

Customized Control Program

Volume Discounts

Special Needs – Call Us!



8031 Mt. Aukum Rd. • PO Box 529 • Mt. Aukum, CA 95656-0529
530-620-1624 • www.chaseresearchgardens.com

Certificate of Compliance APHIS Permit #72306

▲ Request 90 ▲

Know your soil pH in seconds!



Kelway® HB-2
Professional soil acidity & moisture tester

- Portable
- Low cost
- Big, easy-to-read dial
- Built for long-lasting use

Tells you when to lime.
Now, read soil pH in seconds with KELWAY HB-2 acidity tester. Learn on-the-job whether to add lime and how much. No batteries. No reagents. No chemicals. Just insert KELWAY soil tester into moist soil. Professionally designed for growers, the KELWAY tester gives direct acidity and moisture readings. Contact your local distributor or write for FREE informative literature today.

Kel Instruments Co., Inc., Dept. M
P.O. Box 54, Wyckoff, NJ 07481

▲ Request 91 ▲

Aquafog® TurboXE™ Fogging Units



Achieve superior propagation results or maximize your evaporative cooling potential with Aquafog. These powerful and dependable fan units can atomize large volumes of ordinary water supplies into a very fine fog for humidification or cooling requirements.

- Recently improved fog quality
- Visual flow-meter control
- Corrosive resistant for extreme environments up to 100% RH
- No high pressure pumps or water filtration required
- Connects to ordinary utilities

1-888-889-4407
www.jaybird-mfg.com

▲ Request 92 ▲





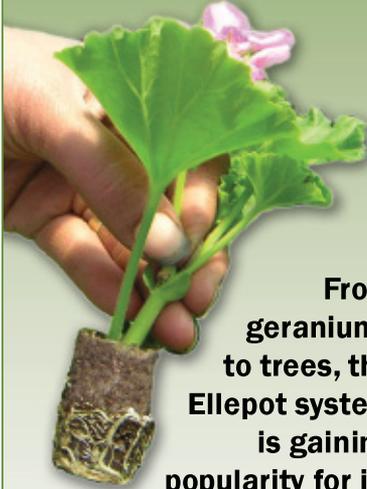

EASON
 HORTICULTURAL RESOURCES, INC.

The Best
 horticultural products from
 major US growers at the
 most competitive prices.

Call us today to
 place your order

800-214-2221
www.ehrnet.com

▲ Request 67 ▲

Ellepots
 for your next cuttings!

- Fast, healthy root development
- Reduced die off
- Faster crop turnover
- \$\$\$ in your pocket

From geraniums to trees, the Ellepot system is gaining popularity for its ease of handling and terrific results. We'll gladly provide you with samples.

Call for your nearest distributor...


Ellepots
 by A.M.A.

1-800-338-1136
www.amaplas.com
 Fax 519-322-1358
ama@amaplas.com

▲ Request 68 ▲

Production schedule*

Propagation (72-cell liner)

Duration: 4 weeks
Temperature: 75°F-85°F
Light intensity
(footcandles): 1,000-1,500

Finish in 4-inch pot

Duration: 24-32 weeks at 84°F
Temperature: 76°F-90°F
Light intensity
(footcandles): 1,000-2,500

Finish in 6-inch pot

Duration: 32-40 weeks at 84°F
Temperature: 76°F-90°F
Light intensity
(footcandles): 1,000-2,500

* Photoperiod for all is natural daylength or 16 hours.

tion length can be reduced and finished quality increased by planting more plugs per pot or using older plugs with larger rhizomes.

During the finish stage, the light level should be maintained at 1,000-2,500 footcandles using shade cloth to provide diffuse light. When growing at the upper end of the temperature range, 86°F-90°F, the light level should not exceed 2,000 footcandles to avoid scorching the leaf tips. Plants grown at a low relative humidity (less than 50 percent) and a temperature above 79°F may also show leaf tip burn symptoms.

Irrigation and fertilization

The ZZ plant grows best when the growing medium remains moist, but not completely saturated. Although the crop can tolerate a dry medium, repeated moisture stress will reduce growth and slow production time.

Fertilize with a balanced water-soluble fertilizer that supplies 125 to 150 parts per million nitrogen at every watering. A controlled-release fertilizer can also be either incorporated into or topdressed on the growing medium.

Plants have been observed to have very few disease or insect problems.

Matthew Blanchard and Roberto "RoLo" Lopez are graduate assistants, Michigan State University, Department of Horticulture, A288 Plant and Soil Sciences Building, East Lansing, MI 48824; (517) 355-5191; mgblanch@msu.edu; lopezro4@msu.edu.

GMPRO