

LIFE™ CLONING TRIAL

ROOTING OF BASIL STEM CUTTINGS IN RESPONSE TO CLONING SOLUTIONS

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PURPOSE

To compare the effect of two different cloning solutions, LIFE and Clonex, on the formation and development of roots in basil stem cuttings propagated in aeroponics.

SUMMARY

Roots systems for LIFE cuttings had on average **20% FASTER ROOTS, 23% MORE ROOTS (dry weight basis) and 32% LONGER ROOTS** than Clonex cuttings.

PROTOCOL

Stock plants of basil (*Ocimum basilicum*) 'Pluto' were grown in 4-inch containers in a peat/perlite based soilless substrate (Lambert LM-111). Stock plants were grown and the experiment was conducted in glass greenhouse at Cornell University (Ithaca, NY) maintained at 70 °F. Ambient light was supplemented with 1000 W high pressure sodium lamps suspended about 5 feet above plant canopy delivering ample light daily.

Two cloning solutions were compared in the experiment LIFE (0.5-1-0.5) and Clonex (1-0.4-1). Eight aeroponic units (Botanicare Clone Machine 48) were used for rooting. Four units were randomly selected for use with LIFE and 4 with Clonex solutions. Each unit was filled with 8 gallons of reverse osmosis purified water. Cloning solutions were added following their label rates. The pH of the solution was adjusted to 5.5-5.7.

Cuttings were inserted into neoprene collars (with 1 cutting per collar) and placed into aeroponic units with about 4 cm of each cutting below the collar. For each rooting date, 6 basil cuttings were installed in each aeroponic unit. Every 2-3 days another series of cuttings was selected for rooting for a total of four rooting dates. Each cutting was monitored every 2-3 days to take pictures of representative plants and to record visual root index. When cuttings were monitored, cloning solution was added to top off the containers to the 8 gallon fill line. At this time pH and electrical conductivity (EC) were recorded and pH was adjusted to 5.5-5.7. Every 7 days the cloning solution was completely replaced.

Within each series of cuttings, measurements were taken to determine root index, length of the longest root of each cutting, and roots were removed from the stem and placed in an oven to determine dry weight.

4 series of cuttings (2 x 4 x 6 x 4 = 192). For either cloning solution no cuttings were observed to have died during the experiment.

FINDINGS

Roots appeared on stem cuttings about 4-5 days after rooting. LIFE cuttings had visually longer roots than Clonex and were ready for transplant at day 7-8 while Clonex cuttings were ready for transplant on day 9-10.

"Basil cuttings propagated using LIFE were ready for transplant about **two days earlier than Clonex cuttings."**

-Professor Neil Mattson

The length of the longest root on each stem cutting was measured at day 9-10. Root length can be taken as an overall quality measurement of the root system. In each of the 4 rooting series there was a significant increase in root length for LIFE cuttings as compared to Clonex.



CLONEX

LIFE

"Overall, cuttings propagated with LIFE cloning solution had a **32% greater root length than Clonex"**

-Professor Neil Mattson



CLONEX



LIFE

Root dry weight was determined by separating roots from stem cuttings at day 9-10. Dry weight is a good measure of the total biomass (or overall size) of the root system. Life cuttings had a **23% greater root dry weight** than Clonex.

CONCLUSION

For all three measured parameters of root quality (index, length, and dry weight), the basil cuttings propagated aeroponically with LIFE cloning solution were superior to those propagated using Clonex cloning solution.