EVALUATION OF SOIL SOLARIZATION ON COMMERCIAL CUT FLOWER FARMS

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Large-scale field demonstration trials were conducted in Stuart and Hobe Sound, Florida on commercial cut flower farms to evaluate the performance of soil solarization as a nonchemical alternative to soil fumigation. A clear 1 mil low density polyethylene film containing 9-month UV stabilizer (Guardian Film, Grupo Olifinas) was applied as a solid-tarp (broadcast) on 0.5 acre plots. The solarization period was approximately 8 weeks. In 2008, maximum soil temperatures at 5 and 15 cm depths were 60.9 and 45.6 C, respectively. At 5 and 15 cm depths, soil temperatures were above 45 C for 111 and 5 hrs, respectively during the 8-week solarization period. In 2009, modifications to the solarization procedure were implemented to improve soil heating. Soil temperatures above 60 C were consistently achieved at 5m depths and soil temperatures above 45 C were consistently achieved at 15 cm depths. Soil heating was also improved down to a 25 cm depth.

Bioassays for weed seed densities indicated the solarization effect did not extend beyond a 5 cm depth for populations of portulaca, pigweed and clover. However, visual estimates of weed emergence indicated that competition from clover was reduced in subsequent lithianthus and ornamental sunflower crops. No phytotoxic effects on subsequent ornamental crops were observed.