

## **Effects of Elite Gardens “Resin D” Crop Fertilizer Supplement on Essential Oil Production in Scotch Spearmint.**

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*Study conducted at Grozine Research Greenhouse, Vancouver Island BC April to June 2016*

### **Summary**

Results show that including Resin D in the hydroponic nutrient solution, will have a positive impact on final total essential oils extracted and thus are of greater economic interest compared to crops not treated with this bioactive fertilizer supplement.



### **Introduction**

There are a variety of crops whose perceived economic value relates to the quality and quantity of essential oils that result in the harvest. Culinary herbs are a common example, and of more recent interest are essential oils as relate to nutraceutical or medicinal applications. In short, the higher the resin content, the greater the potential economic value of the harvest with other factors remaining equal (ie total harvest weight).

Some nutrient additives formulated for this purpose may contain harmful PGRs (plant growth regulators), and while potentially increasing essential oil contents, may not be healthy to apply or ingest for humans and animals while toxicifying soils, grow media and the environment.

Elite Gardens Resin D formulation is said to contain no harmful PGRs and uses basic fertilizer elements and proprietary blends of botanical ingredients (ie extracts or derivatives)



The present study assesses the effect of including Resin D (crop fertilizer additive) on spearmint plant growth patterns and essential oil concentration. Results indicate that adding Resin D to a complete and nutritionally balanced hydroponic nutrient solution will have a significant and positive effect on increasing essential oil production in Scotch Spearmint (a crop valued for essential oil quality and quantity in harvested material)





## Methodology

Ten cloned Scotch spearmint plants of similar age and size for each treatment (20 plants total) were planted in identical substrates and Recirculating Deep Water Culture hydroponic systems, on April 8th 2016 (one plant per 8" net pot, two plants per UC Pro module, five modules for each treatment, for 10 plants of each treatment).

The ten plants for each treatment were selected for consistent, size and health from a larger number of plants cloned from identical mother stock in an EZ Clone Low Pro aeroponic plant propagation system).

All twenty plants were grown together for two weeks in the same 5 module RDWC system filled with EvolutionRO filtered water and following the Elite Nutrients Veg program to 0.5 to 0.6 EC. The pH was maintained at 5.6 to 6.2.

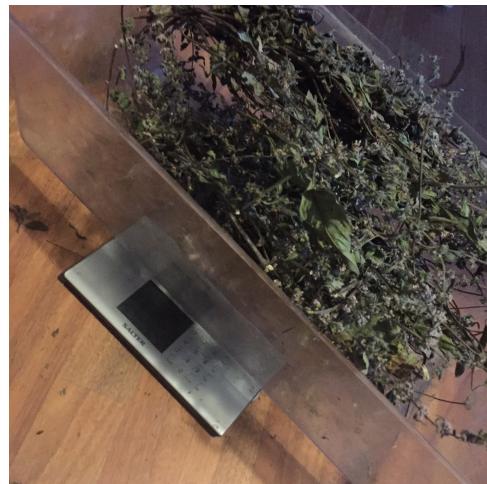
After plants were well established, the system was emptied, and ten plants were moved into the other identical 5 module RDWC system. The two systems were filled again with EvolutionRO filtered water and this time filled following the Elite Nutrients Bloom program to 0.5 to 0.6 EC, and maintained at pH 5.6-6.1. In System A Resin D was added, in system B Resin D was NOT added—the only difference in the two systems.

During the cropping period, the pH was checked and adjusted daily to 5.6 to 6.1 and fresh EvolutionRO filtered water was used to top off each of the systems as levels depleted from uptake. The EC was maintained by adding proportionate amounts of Elite Nutrients as per Bloom Feeding program, with System A receiving Resin D in the correct portion to other nutrients added.

At harvest, June 10th, 2016 the Six Plants (modules A2, A3, A4 & B2, B3, B4) from each treatment were harvested, and measured for fresh weight, air dry weight and essential oil content.

Essential oil extraction from 100 gram dry weight samples of each treatment was performed using a 5L bio flask and glass steam distillation apparatus designed specifically for extracting

water soluble botanical oils. Final oil yields per 100 grams of air dried material were measured, and the total yield essential oils for each treatment, was calculated.



## Results

RDWC System	Treatment	Fresh Weight (grams)	Air Dry Weight (grams)	Extracted Oil / 100 grams	Weighted Oil Content
A	Resin D	2123	435	1.61	7.0035
B	No Resin D	1861	414	1.07	4.4298

System A, which included Resin D as described through the Methodology section, produced a higher Fresh Weight, Dry Weight and yielded 58% more essential oil extract versus System B, which did not include Resin D with all other factors remains equal through the cropping trial, drying, extraction and analysis.

The best results occurred when Resin D was included as part of the regular feeding program in hydroponic resin producing plants (Scotch Spearmint).

