

Rock Resinator (RSN8) Testing for Efficacy in Increasing Essential Oils & Resins in Scotch Spearmint

**For Rock Nutrients
Study Conducted By Erik Biksa (AG-Dip.)**

Section I

Purpose:

To determine if Rock Nutrients crop fertilizer supplement “Resinator” (RSN8) treatments can increase the essential oil content in Scotch Spearmint versus Untreated Scotch Spearmint in a side by side controlled growing environment study when applied as per stated directions on product label.

Method:

Cultivation of Test Material for Resin & Essential Oil Extraction:

The first step in the process is growing two nearly identical crops of Scotch Spearmint (commercial asexually propagated rootstock obtained from Richeter Herbs, Ontario, Canada) in a controlled indoor growing environment that operates independently of external conditions and utilizes HID (High Intensity Discharge) grow lights to control light duration and intensity. The growing environment is controlled for temperature, humidity and co2 levels. All plants in the study, and replications of TEST (Resinator) and CONTROL (NO Resinator).

The ONLY difference in the treatments of the TEST vs CONTROL plants through the entire study grow trial is that the TEST plants will receive additions of Rock “Resinator (RSN8) as per product label, in conjunction of regular feedings (as noted in grow journal study provided) with Rock Nutrients Fusion Grow (one part liquid plant fertilizer concentrate, diluted in waterings) for the vegetative stage of growth-along with applications of Rock Nutrients “Supercharge”-as noted in grow journal study.

During the flowering or “bloom” phase of the crop, Rock Nutrients Fusion Bloom (one part liquid plant fertilizer concentrate, diluted in waterings) is applied to all plants in the study as per label directions, or as noted in grow journal study provided. The TEST plants, as indicated in the grow journal study, received identical feedings, with the exception that Rock Nutrients Resinator was added to the fertigation of the TEST plants in the study.

At final transplant, prior to initiating the Bloom phase by increasing the duration of the uninterrupted dark cycle (as noted in grow journal study), BOTH Test and Control treatment plants are further divided into group (4 plants per 10 gallon container) and single plantings (one plant per 5 gallon container).

An equal number of plants and replications was created and placed alternately in the even light and temperature grid created inside of the 4' X 12' X 7'-6” tall Homebox growing enclosure-as noted and photos demonstrate in grow journal study. NOTE: TEST plants in both Group and Single planting replications are indicated with a 12” long marker stake.

Plants will receive identical waterings, care and treatments with exception of Rock Nutrients Resinator until mature and harvested. All plants harvested in identical fashion on the same harvest date-as noted in the grow journal study accompanied with this submission, and received equal drying and curing conditions, as noted in the **HARVEST** section of this submission.

Resin & Essential Oil Extraction:

Scotch Spearmint plants harvested, dried and cured as per the *Cultivation* outline and methodology above will be subjected to identical Direct Steam Distillation Essential Oil Extraction procedures in the same Distillation Apparatus (2L Bioflask Model via “HeartMagic”-see MATERIALS).

The essential oil yields that results from identical essential oil extraction procedures with the identical direct steam distillation apparatus versus TEST and CONTROL plant material will be compared in both volumetric and mass analysis to determine if there was any increase in plant resins and essential oils from regular applications of Rock Nutrients Resinator fertilizer supplement, as per label directions and as noted in the grow journal study included with this submission.

Materials:

CULTIVATION

(NOTE-further detail is provided in images and written portion of grow journal study that accompanies this submission for review)

1-3.3' X 3.3' X 7'-6" tall “Hydro Hut, California, USA” sealed growing tent with climate control for temperature and humidity with HID grow lighting (early growth phase)

1-4' X 12' X 7'-6" tall “Homebox Modular, Berlin, Germany” sealed growing tent with climate control for temperature, humidity and Carbon Dioxide levels with HID grow lighting (Final Transplant and Production to Maturity and Harvest)

Rock Nutrients Products:

Fusion Grow
Fusion Bloom
Supercharge
Resinator

Pro-Mix (High Porosity Blend, Peat based soilless growing mix containing sphagnum moss, perlite, vermiculite, lime (pH buffering) and a low fertilizer charge)

Plastic Nursery Containers-as noted in grow journal study)

HID (High Intensity Discharge) Crop Lighting-as noted in grow journal study

InfraRed CO2 monitor and gas fired CO2 generator to maintain AVG of 600-700 ppm CO2 during LIGHT cycle

Dehumidifier, for humidity control-runs constant, levels as noted in grow journal study

Temperature (cooling, and to some extent dehumidification) via Water Cooled Air Conditioning Unit (no exchange with outside air, allows “Sealed” growing environment)

An activated carbon filter run constant inline with the air handling system to promote healthy air that is free of dust and contaminants in the grow chamber at final transplant.

Air circulation is provided constant with fans and air handling system.

RESIN & ESSENTIAL OIL EXTRACTION

1-2L HeartMagic Direct Steam Essential Oil Distillation Unit (Borosilicate Glass Construction throughout). <http://heartmagic.com/eoinstructions.html>

De-Mineralized Water

Harvested TEST and CONTROL Scotch Spearmint (parent material for extraction)

Measuring Cups

Glass Bowls

Digital Scales (as per images in **EXTRACTION** Section, GRAM accuracy for plant material, 1/100th GRAM accuracy for essential oil measurements)

Containers or Vials for capturing and storing essential oil extracted, as described in materials and methods