EVALUATION OF SIMULATED HAIL DAMAGE TO PEPPERMINT IN CENTRAL OREGON, 2001

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Abstract

This is the first year of a multi-year study to determine the effect of simulated hail damage on oil yield of peppermint. Timing and severity of damage were evaluated at 6 weeks, 4 weeks, and 2 weeks prior to the projected harvest date with untreated plots and 33 percent, 67 percent, 100 percent damage.

Introduction

Peppermint oil production has historically been an integral part of agriculture in central Oregon. In recent years there has been a decline in acreage due to reduction in price caused by an over supply of peppermint oil, and increasing amounts of verticillium wilt that persists in the soil and reduce yields. The objective of this project was to determine the impact of hail damage timing and severity on peppermint grown for oil. This information will assist the National Crop Insurance Service develop methodology for evaluating hail damage on peppermint.

Methods and Materials

This is the first year of a multiple year evaluation on the effect of simulated hail damage to peppermint grown for oil. The study was conducted in commercial fields under a center pivot in an area known as the grasslands between Madras and Prineville. Plots were 5 ft x 10 ft replicated three times in a randomized complete block design.

Variables evaluated in this study included three timings and four levels of damage. Timing of damage was 6 weeks, 4 weeks, and 2 weeks before the projected harvest date. Actual timing was 37 days, 23 days, and 9 days prior to harvest. Severity of damage included 33 percent damage, 67 percent damage, and 100 percent damage, all of which were compared to undamaged plots.

A Jari mower was used to cut 3-ft alleyways across the front and back of each row of plots on July 18 and August 15. Treatments were made July 18, August 1, and August 15 using a battery-powered hedger to remove either one-third of the growth, two-thirds of the growth, or all the growth except the bottom 4 in. A portable seed stripper (multiple headed weed eater) was used to damage the remaining foliage at the same rate as the growth reduction applied to each plot. A 40-in x 10-ft portion from the center of each plot was harvested with a plot-sized swather August 24, just prior to commercial harvest of the field.

Results and Discussion

The closer to harvest hail damage occurs, the less time there is for peppermint to recover. Plots treated 9 days before the trial was harvested (2 weeks prior to projected harvest) did not have adequate regrowth to be harvested. Yields were severely reduced in plots with 66 and 100 percent damage 23 days before actual harvest. Although other yield reductions were not

statistically significant, the trend was for a reduction in yield as the amount of hail damage was increased for both application dates. Later damage reduced yields a greater amount than early damage for plots with 66 and 100 percent damage, but was similar for 33 percent damage for both application dates. Evaluating the amount of oil recovered per biomass harvested does not appear to provide any additional insights.

The yield in untreated plots was 41 lb/acre compared to an average of 87 lb/acre on the rest of the field harvested and distilled commercially. These results, and those of other researchers whose samples were distilled at the Central Oregon Agricultural Research Center, indicate that the distillation process provided substantially less oil than expected or recovered commercially adjacent to research plots. It also makes one less confident that the distillation process was consistent between the samples.

Table 1. Simulated hail damage on peppermint grown for oil with damage inflicted 37 and 23 days prior to harvest on August 24, 2001.

Hail damage		Oil		Biomass		Oil / biomass
--%--	days to harvest	---lb/acre---		---t/a---		---lb/ton---
0	---	41.2	a[1]	15.1	a	2.7
33	37	32.5	ab	12.3	b	2.6
66	37	29.5	ab	9.8	bc	3.0
100	37	16.5	ab	8.8	c	1.9
33	23	30.4	ab	10.2	bc	3.0
66	23	10.2	b	4.7	d	2.2
100	23	2.5	b	1.6	e	1.6
						NS

[1]Mean separation with Student-Newman-Kuels (SNK) Test at $P \leq 0.05$.