

ABSTRACT

Factors affecting growth and the yield of oil
in Spanish thyme (*Lippia micromera* Schau.)

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The plants' response to levels of N (0, 20, 40 and 60kg N/ha) and P (10 and 20kg PO₄/ha) at different spacings (50, 100 or 150cm intra-row x 160cm inter-row), was monitored during the dry and wet seasons.

The development of individual shoots was observed during both seasons, and distribution of oil along a single shoot was measured in the wet season.

In a greenhouse experiment, the effect of varying levels of water stress on plant growth and oil content was observed.

Finally, the development of leaves was observed over 8 weeks.

Application of N significantly increased fresh herbage yield/plant (wet season), while there was no significant effect in the dry season. Application of 40kg N/ha significantly increased herbage yield/ha in the wet season. Phosphate application did not affect herbage yield/plant nor per hectare. At 100cm intra-row spacing herbage yield/plant was significantly increased in both seasons. However, herbage yield/ha increased significantly as spacing decreased. Herbage yield was significantly higher in the wet

than in the dry season. Neither N, P nor spacing affected oil yield per plant, but oil yield/ha increased significantly with increased plant density. Oil content (% v/w) was lower in the wet season, while oil yield/ha was higher in the wet season.

There was a decrease in fresh and dry weights with increased water stress, while oil yield (ml/plant) and content (% v/w) increased with increasing stress.

The young shoot tips yielded the most oil, while the base of the shoot yielded the lowest.

Three hair types (short, long and sessile) were observed. Their involvement in oil production was suggested. Densities of sessile and long hairs were higher on the abaxial leaf surface than on the adaxial surface with the opposite being true for short hairs.