Effect of mushroom compost manure on soil water retention and squash yield.

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Mulching with spent mushroom compost retains moisture and boosts spaghetti squash yield.

Introduction

- Approximately 30% of soils, in more than 30 countries, are suffering from micronutrient deficiencies. Compost can maintain and enhance the stability and fertility of agricultural soils.
- Spent mushroom substrate (SMS) is a composted byproduct of mushroom production, and can be applied to soils to promote humus formation. SMS provides plant micronutrients, and improves water holding capacity, soil aeration and aggregation.
- Squash (*Cucurbita pepo)* is the species with the greatest monetary value of the genus Cucurbita L. Squash (*Cucurbita pepo)* has similar water requirements to fruit trees.

Objectives

1. Study the use of mulching with SMS as an ecologically sound alternative to disposal.
2. Explore SMS's potential as a soil amendment and mulch, to encourage its use on local farms.
3. Contribute to the agricultural knowledge related to the utilization of MCM for water conservation in agroecosystems.

Methods

Randomized complete block design. Analyzed with Repeated Measures ANOVA and ANOVA, conducted using the jamovi interface to the R statistical computing environment.

- 4 blocks
- 16 plots
- 4 treatments (0, 5, 10, or 20 cm of mulch)

Results

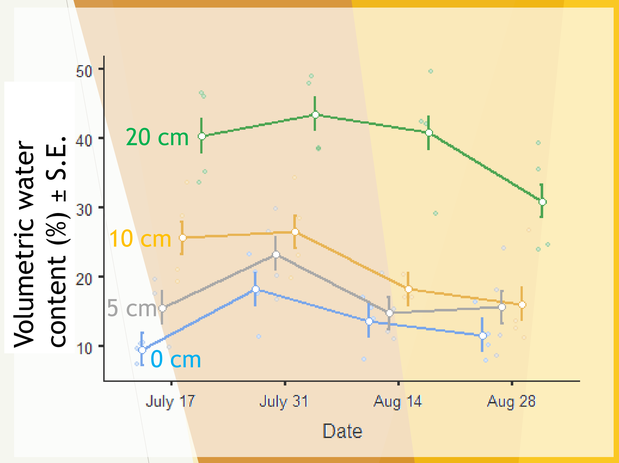

Figure 1. Relationship between volumetric water content (%) and collection dates for squash mulched with different application rates of mushroom compost manure (0, 5, 10, 20 cm). Bars show the standard error around each mean.

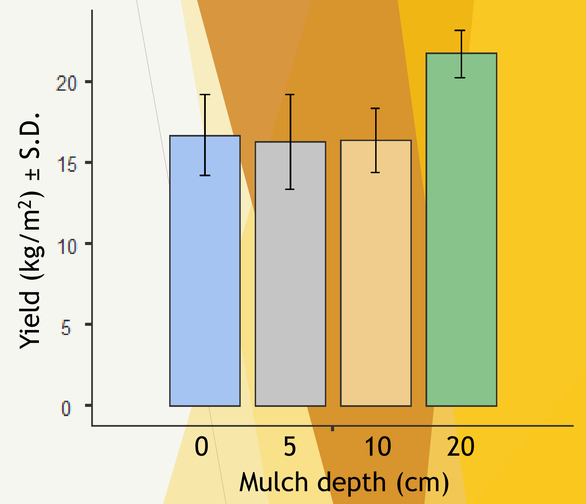

Figure 2. Yield of squash mulched with various depths of mushroom compost manure. Bars show the standard deviation around each mean.

Discussion

- The decline in volumetric water content over the monitoring period reflects a regional drying pattern due to low summer precipitation.
- SMS mulch depth was positively correlated with soil moisture retention. Mulching with SMS could potentially reduce the need for irrigation in squash.
- Although no significant yield effects were detected, the 20 cm mulch treatment tended to have numerically higher yeilds.
- Average squash yield was 178 ± 12 t/ha (79 ± 5 short tons/ac), which compares very favorably to a typical good squash yield of 56 t/ha (25 short tons/ac).

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