

# **Project proposal: Quantifying the contribution of living mulches towards plant performance of newly established apple orchards in the Western Cape.**

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## **Introduction**

The drive towards sustainability as well as reduced input cost in commercial fruit production initiated a project to investigate the feasibility of growing living mulches in apple orchards as alternative to non-living mulches. Although living plants in the tree row compete with the main crop in terms of water and nutrient requirement, there are also numerous benefits that need to be quantified to enable the final costs to holistic fruit production when introducing living mulches.

## **Materials and methods**

Different mulches were introduced in the tree row of apple orchards in Elgin, Western Cape, South Africa. Four living mulch combinations were established during April 2019 and will be compared with an organic, but non-living mulch (bark chips), irrigated with micro irrigation. The trial layout is a randomised block design.

A permanent cover crop is maintained in the work row and standard, commercial practices will be followed regarding management practices.

The following data needs to be collected on one tree per plot:

Plant performance

- Yield

- Vegetative growth – stem diameter and avg shoot length

- Physiological parameters – stem water potential (pressure bomb), chlorophyll (SPAD), stomatal conductance (porometer)

Soil parameters

- Soil temperature and moisture – continuous logging probes

- Soil density – soil penetrometer

- Water holding capacity

- Weed suppression – ID weeds and density

- Organic matter changes/microbial activity – unknown yet

Mineral analyses

Roots

Destructive root study

Economics

Quantify the input costs of the mulches

Quantify possible contributions of the mulches with reference to irrigation and nutrition