



agriculture & environmental affairs

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Agriculture
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PROVINCE OF KWAZULU-NATAL

MULCH-EFFECT ON WEED GROWTH, SOIL MOISTURE, YIELD AND YIELD COMPONENTS OF GROUNDNUTS UNDER THE CONDITIONS OF KZN PROVINCE

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Introduction

Groundnut is the most important oilseed crop in the world; it contains 48 – 50 % oil, 26-28 % protein and is a rich source of dietary fiber, minerals and vitamins. Groundnut growers at Matiwane are situated at fairly normal rainfall area of about (600-779 mm) per annum, the drought incidences normally occur in Uthukela District, especially during hot months. In areas where drought stress is common soil moisture is limited. The three mulching materials, white plastic, maize straw and grasses were tested against weed growth, soil moisture, yield and yield components. The aim was to determine soil moisture, yield and yield components and weed growth under five treatments on groundnut production.

Materials and Methods

An experiment was initiated under field conditions on 20 December 2012 at Matiwane farms, (29° 52' 38. 752 E). Treatments were arranged in randomized complete block design (RCBD) with six replicates. The mulching treatments included maize residue, grasses, plastic, No weeding and hand weeding, treatments were applied after one week of planting. Plot size was 3.0 m x 6.0 m with an intra-row spacing of 7.5 cm and inter-row spacing of 60 cm. Plant population used was 222 000 plants per ha. The cultivar used was Kwarts. The soil moisture was measured 30 days after sowing (DAS) and at harvest, taken from 5 cm to 20 cm depth by gravimetric method. Soil samples from different depths were weighed and air-dried. The occurrence, extent and weed types were investigated at 30 DAS in a 900 cm² quadrat at four random locations per

plot. The experiment was harvested at 150 days. Plants were dug out and left to air-dry. Shoots were taken for dry matter analysis and data collected were analyzed by Genstat. Fisher's protected least significant difference (LSD) test was used to separate mean difference.

Results and discussions

Soil moisture: White plastic, grasses and maize residue significantly ($P \leq 0.018$) retained high levels of soil moisture content compared to hand weeding and no weeding treatments. The soil moisture content increased with the depth increase. However, at 10 cm depth mulches had high levels of moisture content. Soil samples taken at harvest were not significant.

Weed infestation: Weed species were highly significant at 30 DAS. Hand weeding significantly reduced weed numbers compared to other treatments. However, No weeding had the highest number of weed species which reduced the yields. Grass, Maize residue and plastic suppressed a significant number of weed species.

Yield and yield components

Hand weeding had significantly high yields, followed by grasses and maize residue, plastic and no weeding with the lowest yields. The results indicate that hand weeded plots did not have weed competition which resulted to high yields. However, uncovered soil surface had the smallest soil moisture percentage. White plastic reduced the plant population giving lowest yields. Maize residue and grasses yields were significantly dependent on the amount of soil moisture content which was consistent throughout. According to BRU data, the optimum groundnut yields under dry land ranges from 1 to 2 t/ha. However, maize residue and grasses increased yields up to 3.3 t/ha.

Conclusion

Mulching materials indicate significance in retaining soil moisture in dry areas of groundnut production. The advantage of the study is that it uses the local available mulching materials. In future these areas could be investigated: soil temperature, the thickness of the mulching material and type. The study is with the aim of reviving groundnut production in the Province. In dry areas where soil moisture is limited and weed problem occur, this study could be of great help. In conclusion grass, Plastic and maize residue retain significant soil moisture in dry areas and improve yields.