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PROVINCE OF KWAZULU-NATAL

VEGETABLE SOYBEAN PRODUCTION

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Introduction

Vegetable soybeans (*Glycine max* (L.)) are the same species as grain soybeans, but they have been bred as speciality cultivars for human consumption. They are harvested at the green pod stage when the beans have filled 80 – 90% of the pod. The beans are larger, sweeter, more tender and have a nuttier taste than grain soybeans. They are regularly eaten in the East, where they are called mao dou (“hairy bean”) or edamame (“beans on branches”). Due to their tastiness and the known health benefits of soybean isoflavones, the crop is now planted in many other parts of the world. In South Africa no commercial production exists to date, but research on the crop is currently being conducted at Cedara.

Materials and methods

The research work is focused on cultivar evaluation, seeding rate, fertility requirements and fungicide and inoculant seed treatments.

- Twenty one cultivars are being evaluated for their adaptability and yield at a seeding rate of 266 666 seeds/ha in rows spaced 0.75 m apart.
- The yield production of three cultivars is being evaluated at seeding rates from 50 000 to 250 000 seeds/ha.
- The effect of different application rates of phosphorous (0, 30 and 60 kg/ha) and potassium (0, 40, 80, 120 and 160 kg/ha) on production is being evaluated on two cultivars on a K deficient soil.

- The effect of four fungicide and four inoculant seed treatments on emergence, nodulation and yield is being evaluated on four cultivars.

Results and discussion

All of the cultivars, which are non-GMO and have a range of growing-season lengths, displayed good adaptability to the conditions at Cedara. However, individual performance varied over the seasons (2010/11 to 2012/13) primarily as a result of the prevailing climatic conditions. Drier conditions later in the 2011/12 season resulted in lower yields from the long-season cultivars, whilst in the 2012/13 season a severe hail-storm resulted in lower yields from the short-season cultivars.

Previous work conducted at Cedara with seeding rates from 200 000 to 500 000 seeds/ha resulted in no significant differences in yield. In the 2012/13 season seeding rates from 50 000 to 250 000 seeds/ha also resulted in no significant differences in yield being recorded. However, the percentage export marketable pods (pods containing ≥ 2 beans) and yield were highest at a seeding rate of 150 000 seeds/ha. Bean size requirement (≥ 30 grams per 100 dry seeds) was also met at this seeding rate.

A significant increase in pod and bean yield was recorded for both cultivars from the K application rate of 0 kg/ha to 40 kg/ha. Applications above 40 kg/ha K did not increase yields significantly. No significant differences in yield were measured for the different P application rates. The results are based on one season's data.

The fungicides, Thiram and Captan, improved plant population but reduced nodulation, whilst the inoculants, Soycap and Eco-soy, increased nodule number significantly above the control treatment (no inoculant). However, no significant differences in seed yield were recorded among the different seed treatments, but significant differences were recorded among the different cultivars.

Conclusions

Although the long-season cultivars produced higher mean yields, short-season cultivars are also recommended, so that the marketing period can be extended for as long as possible. More data needs to be collected before recommendations can be made on seeding rates, fertilizer requirements and fungicide and inoculant seed treatments.