

COMPONENTS OF TUBER YIELD IN SWEET POTATO

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SUMMARY

Studies on the relationships of components of yield with yield itself using correlation and regression analysis lead to a conclusion that the maintenance of the potential for growth in girth of the roots during the latter half of the vegetative growth cycle may be an important determinant of potential yield in the sweet potato.

RESUME

Des études sur les rapports entre éléments du rendement et le rendement lui-même au moyen d'analyse de corrélation et de régression ont permis de conclure que l'entretien du potentiel de croissance de la partie périphérique des racines pendant la dernière moitié du cycle végétatif doit avoir une importance déterminante dans le potentiel de rendement de la patate douce.

RESUMEN

Estudios sobre las interrelaciones entre los componentes del rendimiento, con el rendimiento en sí mismo usando análisis de correlación y regresión, condujeron a la conclusión de que el mantenimiento del potencial para el crecimiento perimetral de las raíces, durante la segunda mitad del ciclo vegetativo de crecimiento, puede ser un factor determinante del rendimiento potencial en camote.

INTRODUCTION

At the crop level, the numbers and sizes of organs per plant are the immediate components of yield, e.g. in cereals,^{1,8} number of grains and mean grain weight, and in root crops,⁴ number and size of roots. In root crops the economic yield is often not the total yield, but that of roots which have attained a minimum size and weight at harvest⁹.

Tuber volume and tuber density may be considered as further sub-components of tuber weight, and tuber cell number and the mean size of tuber cells may, in turn, be considered as sub-components of tuber volume. To obtain a fully analysed understanding of tuber crop yield and to identify possible limitations to tuber yield development, yield components can be considered both at the crop level and at the plant and tuber levels.

In this paper, interrelationships between crop yield in six sweet potato cultivars of different foliage¹⁰ and tuber³ characteristics are examined. Effects of tuber shape on the volume component of tuber weight and of some anatomical attributes of tuber meristems which relate to cell numbers in tubers are outlined. Possible implications of tuber shape and tuber meristem characteristics on tuber crop yield are discussed.

MATERIALS AND METHODS

The six cultivars used in the study include a commercial cultivar 049 as well as A28/7, C9/9, 162, A16/15 and a low yielding cultivar 03/62. Agronomic, physiological and anatomical techniques used in the study are described elsewhere and reference is made to the sources of these techniques in the text. All tuber weights referred to are fresh weights.

RESULTS AND DISCUSSION

Components of sweet potato crop yield

The immediate components of sweet potato crop yield, mean tuber weight and tuber number were found to be in different relationships with tuber yield in the six sweet potato cultivars studied⁴. In a comparison of within-cultivar correlation and regression coefficient among tuber number, mean tuber weight and yield, there were significant positive correlations between tuber number and yield in cultivars A28/7

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