

# POTASSIUM REQUIREMENT OF TARO IN RELATIONSHIP TO GROWTH, FOLIAR ANALYSIS, YIELD, AND QUALITY AS GROWN IN SOLUTION CULTURE

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## SUMMARY

Small plantlets were grown on half-Hoagland and various potassium-deficient solutions which changed weekly.  $\text{KNO}_3$  was added daily to the solutions. Extensive data, analysed by computer is tabulated and highlights discussed. Growth measures could often be fitted to ln-ln functions. Leaf K measured at 91 days can be correlated with yield. Corms from plants grown in solution culture were usually rich in N, P, K and nitrate. The Mg content was significantly higher in Lowthan Complete—K treatments. Taste testing revealed poor panel discrimination with large differences in assessment between coded replicate samples. However, there was generally preference indicated for baked over steamed corms and for the Low-K grown corms.

## RESUME

Des plantules sont cultivées sur sol semi-“Hoag” et des solutions déficientes en potassium qui changent chaque semaine. Chaque jour on ajoute du  $\text{KNO}_3$  aux solutions. Des données détaillées, analysées à l'ordinateur sont classifiées et les éléments discutés. Souvent les mesures de croissance peuvent correspondre aux fonctions ln-ln. La feuille K mesurée à 91 jours peut correspondre au rendement. Les tiges souterraines bulbeuses des plantes cultivées en solution de culture sont habituellement riches en N, P, K, et en nitrate. La teneur en Mg est nettement plus élevée avec les traitements bas K qu'avec les traitements de K complet. Lorsqu'on teste le goût il se révèle que le panneau de discrimination est pauvre avec des écarts sensibles dans l'évaluation des échantillons de replicas codés. Toutefois les tiges bulbeuses cuites au feu ou ayant une quantité basse de K sont généralement préférées à celles qui sont cuites à la vapeur.

## RESUMEN

Se cultivaron pequiñas plántulas en solución un medio-Hoagland y en varias soluciones deficientes en potasio las cuales se cambiaron semanalmente. Se añadió  $\text{KNO}_3$  diariamente a las soluciones. Se tabularon datos extensivos, analizados por computadora y se discuten los puntos mas sobresalientes. Las medidas de crecimiento pudieron ser frecuentemente ajustadas a funciones ln-ln. Se pueden correlacionar el potasio foliar medido a los 91 días, con el rendimiento. Los cormos de las plantas que crecieron en soluciones nutritivas, fueron generalmente ricos en N, P, K y nitratos. El contenido de Mg fue significativamente mas rico en los tratamientos de bajo K que en los que el K estaba completo. Las pruebas de palatabilidad revelaron una baja capacidad de discriminación de parte del jurado con grandes diferencias de opinión sobre muestras repetidas, codificadas previamente. Hubo, sin embargo, preferencia generalizada pro cormos porneados sobre los procesados al vapor y por los cultivados con bajo potasio.

## INTRODUCTION

At alafua, W. Samoa, soil N was low, K was also deficient<sup>2</sup> and there were frequently symptoms of marginal scorch and interveinal chlorosis on taro like those described for *Xanthosoma* sp.<sup>18</sup>. Most taro is planted in lowland and foothill gardens under rainfed culture in Samoa on soil which is highly leached and on which K is usually limiting to production.

On the Dala series soils of Malaita Island (Solomon Islands) Gollifer has reported responses to K fertilizer in taro<sup>7</sup>. Foliar analysis of samples collected on a field study there confirmed K deficiency<sup>1</sup>. Samples for foliar analysis from Keravat, New Britain, P&NG indicated K deficiency and this was associated with excess Mg concentrations. Response to K and P occurred on soils of Moorea I., Society Islands<sup>12</sup>.

When high concentrations of K are in petioles and leaf blades<sup>14,15</sup> this is associated with highest total yields of sucker and main corms. The high K requirement of taro is traditionally met by the usual practice in Pacific islands of planting taro after a tree fallow which would return K to the surface by leaf fall. Such

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