

MECHANIZATION OF TARO (*COLOCASIA ESCULENTA*) CULTURE IN HAWAII¹

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SUMMARY

A modified management system to allow mechanization of taro in Hawaii has been studied. A seedling transplanter has been used successfully to plant taro setts in dry soil. To achieve this the soils were prepared by using a rotovator without puddling. After planting, the fields were flooded and managed in the traditional way. Two mechanical means of herbicide application show promise. A sweet potato/solanum potato digger can be used to harvest the crop. To allow mechanization, the entire management system must be reviewed and modified.

RESUME

Un système de mise en valeur modifié en vue de la mécanisation du tarot en Hawaï e été exposé. Une repiqueuse a été utilisée avec succès pour repiquer des boutures de tarot en sol sec. Pour entreprendre l'opération, le sol a été préparé à l'aide d'un rotovator sans mise en boue. Après le semis, les champs ont été submergés et entretenus selon le système traditionnel de culture. Les moyens mécanisés d'application d'herbicide sont encourageants. On peut utiliser une récolteuse de patate douce pour faire la récolte du tarot. Pour que la mécanisation soit possible, tout le système de mise en valeur doit être revue et modifié.

RESUMEN

Se ha estudiado un sistema modificado de manejo para hacer posible la mecanización de la malanga en Hawaii. Se ha usado exitosamente un transplantador de plantas para sembrar malanga en suelos secos; para lograrlo, se prepararon los suelos con "rotovator" sin humedecer. Después de la siembra se inundó el campo y se trabajó en la forma tradicional. Dos formas mecánicas de aplicar herbicidas se muestran prometedoras. Puede usarse una cosechadora de camote/papa para cosechar este cultivo. Se debería de revizar y modificar todo el sistema de manejo para permitir la mecanización.

INTRODUCTION

Taro (*Colocasia esculenta*) is an important crop in Hawaii^{5,6}. Most of the corms are processed into poi, the paste-like staple food of the ancient Hawaiians. The crop is produced in flooded fields which are managed much like flooded rice (Fig. 1). Traditional taro production requires long hours of standing and working in mud and water. Therefore, in spite of the good income obtainable from growing taro, few young farmers are entering the industry. If taro production is to survive, the management system must, at least in part, be modified to mechanization. This work presented results from a grant by the State Legislature to the Hawaii Agricultural Experiment Station.

MECHANIZATION PROBLEMS IN FLOODED SOILS

Most mechanization problems are related to the practice of growing taro in small flooded fields⁷. Throughout most of the crop period the soil surface is covered with 2 to 10 cm of slowly moving water. Traditional land preparation consists of ploughing or harrowing and then puddling of the soil. The cuttings or setts (consisting of about 6 to 12 mm of the tip of the corm plus the lower 20 to 30 cm of the petioles) are then planted by hand in the soft mud. Plant populations range from about 12,000/ha (90 x 90 cm spacing) under high solar radiation. Weeds are controlled mainly by flooding and by hand pulling. Crop duration varies from 12 to 16 months or so. Harvesting is done by hand, using a pipe with a sharpened tip to loosen and pry the corms from the soil and to sever roots. Mud is washed from the corms which are separated from petioles and leaves, and the corms are then bagged for shipment to the processing plant.

The main hand labour requirements for taro culture occur during planting, weed control and harvesting. Of these tasks perhaps harvesting is most onerous and difficult. In our programme it was decided to examine mechanization possibilities in planting, weed control and harvesting.

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