

NO-TILL TARO PRODUCTION IN HAWAII

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A major portion of the taro produced in Hawaii is cultivated under dryland conditions. Practically all taro farmers plow and disc their fields to provide a vegetation-free surface before the crop is planted. Unprotected fields are very susceptible to soil erosion due to heavy rains and a lack of soil-conserving practices such as terracing and contour farming. No-till taro production is being introduced in Hawaii to provide growers with a means of planting their crop to fields protected by a thick layer of mulch to reduce soil erosion and minimize the need for heavy equipment for land preparation.

One reason given for plowing is to eliminate weeds at planting, giving the crop a head start on growth. Other reasons given for plowing are increasing soil aeration, alleviating compaction, and providing a soft soil for optimum crop growth. Research on many other crops has shown that plowing is not essential for optimum growth and in many cases is the primary factor in the degradation of soil structure and loss of organic matter.

The no-till planting cycle begins as soon as the current crop is harvested and the fields are returned to a smooth clean surface. Instead of allowing weeds to grow, a vigorous ground cover is planted. The ground cover is selected for rapid growth and production of a large quantity of biomass. The ground cover is heavily seeded to exclude weedy plants and to fill the soil with roots to recover any nutrients left by the previous crop. The ground cover grows until the farmer decides to replant the field.

In no-till cropping systems, the functions of the plow are replaced with synthetic herbicides. The contact herbicide Roundup (Monsanto) is used to kill the ground cover before the taro is planted. The first Roundup application is made three to four weeks before planting. This lead time allows sprayed plants to die back and reveal any untreated plants that were either missed or sheltered by other plants. A second Roundup application is made 14 to 20 days after the first to insure good kill of all vegetation. In Hawaii, a no-tillage planter has been used to plant the taro directly into the herbicide-treated ground cover.

The no-till planter used in Hawaii is a standard "Mechanical Transplanter" (Holland Michigan) mounted

on a three-point hitch tool bar with a large fluted coulter to cut through the mulch and prepare a trench for the large planting shoe. A fertilizer hopper is mounted above the tool bar and can deliver two fertilizers of different sizes (currently pelletized chicken manure and granular 15-15-15 N-P-K blended fertilizers). Both materials are delivered directly to the trench into which the taro will be planted. Press wheels seal the planting trench and are usually weighted to insure good soil contact with the taro seed pieces. Two people sit on the planter and insert seed pieces into the rotating planting baskets. A third person walks behind the planter and fills skips and corrects any other planter errors.

After planting, Goal (Rohm and Haas Co.), a pre-emergence herbicide, is sprayed over the entire taro planting to prevent the germination and growth of a wide variety of weeds. The legally allowable amounts of Goal, applied at planting, provide about two months of weed free growth. Weed escapes are removed either manually or treated with a directed spray application of Gramazone (ICI Americas). A second Goal application is made after weed removal and hilling-up of the taro (performed 2-3 months after planting).

A video tape of the entire no-till taro production system is being prepared and will be ready for distribution by mid-1993. The programs will cover all aspects of planting, herbicide spraying, and taro response to no-till and conventional field preparation. Additionally, taro corm size and shape in response to hilling will also be demonstrated.

The Editor

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