The Effect of Ridging on Ease of Harvest, Root Distribution, and Toxic Constituents of Derris elliptica

(Abridged)

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ONE OF the most tedious and costly operations in the commercial production of Derris has been the manual digging of the roots. An experiment was started to determine the effect of ridging on the ease of harvesting, root development, and insecticidal constituents of the roots.

Three types of plots were used: (1) level ground, (2) ridges that were 8 inches high, and (3) 16 inches high. The harvest made 30 months after planting was subdivided into three phases. First a number of the plants were dug by spading out successive 6-inch soil layers to determine the effect of treatment on root distribution, size, and yield. Second, the remaining experimental plants were spaded out as rapidly as possible to determine the effect of treatment on the ease of harvest. Third, border rows were dug with plow and tractor.

Chemical and biological assays were made of experimental plants. A summary of the data shows that: (1) The root yields of Derris elliptica Changi 111 MG 6 grown on level, 8-inch ridged, and 16-inch ridged plots were essentially the same; (2) about 95% of the total weight of root was found in the top 18 inches of soil, irrespective of treatment; (3) harvesting the roots of plants grown on ridges was easier than on level ground; (4) harvesting by tractor and plow was from three to four times faster than digging manually, however, only 75% of the roots were recovered; (5) all chemical and biological toxicity values decreased as the height of the ridge increased; (6) red-color values of the root sub-samples increased with the depth of the excavated soil layer; (7) total chloroform extractives decreased as the diameter size increased for all treatments; (8) the treatments produced a characteristic distribution by diameter groups; the plants growing on the ridges had more large (10 + mm) and fewer medium (4–10 mm) and small (under 4 mm) roots than those grown on level ground.

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