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Weed Population in Cowpeas (*Vigna Unguiculata* (L) Walp) as Influenced by Water Table, Moisture Regime and Cultivar

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Experiments were conducted during the 1987-88 dry season to determine the influence of irrigation water and naturally occurring water table depths in a toposequence, on the weed ecology of two cowpea [Vigna unguiculata (L.) Walp] cultivars at Los Baños, Philippines. In the line source sprinkler irrigation experiment on a Typic Tropudalf, saturated and wet treatments had a higher weed population than the dry treatment. In the toposequential agrohydrology experiment, the shallow and medium water table depths had greater weed populations than the deep water table depth regime. In both experiments the early maturing cultivars had a higher LAI in their early phase of growth. This was associated with reduced weed competition as compared to the medium maturing cultivars, irrespective of moisture regimes.

Keywords: Early maturing, medium maturing, line source irrigation, toposequential agro-hydrology, post-rice environment

Cowpea is grown in lowland rice fields during the dry season in the tropics. During this season the crop generally suffers from excessive moisture during its vegetative growth stage because of intense rainfall (Herrera and Zandstra, 1977; Herrera and Zandstra, 1979) and/or a shallow water table which is prevalent in lowland fields (Hulugalle and Lal, 1986). However, in some post-rice situations, drought is the predominant stress due to a rainfall deficit in association with a deep water table. Timsina et al (1984) reported a wide range of weed species in cowpea fields in the post rice dry season. They concluded that cowpea cultivars that produce good vegetative cover may minimize the weed problem.

Previous studies reported the influence of moisture regimes on the weed ecology of rice (Moomaw et al, 1966; Smith, 1970; Smith and Fox, 1973; Navarez et al, 1979; Janiya and Moody, 1982; Pathak et al, 1989). Most of these studies agreed that flooding suppresses, but saturated soil encourages, the growth of dryland weeds (Garcia, 1931; Smith and Fox, 1973; Civico and Moody, 1979). Samiano and Motooka (1979) also reported a direct correlation between the frequency of irrigation and weed density.

High plant population or closer spacing is a recommended practice for minimizing weed problems in many crops (Kawano et al, 1974; Moody, 1979; Kim and Moody, 1980). Similarly, some studies have shown cultivar differences in the suppression of weeds (IRRI, 1976; Moody, 1979). But not all studies have shown such differences (Kim and Moody, 1980). The competitive ability of crop cultivars against weeds was attributed to their respective morphological characteristics.

Cowpea cultivars vary in their competitive ability against weeds. The cowpea cultivar EG #1 was found to be more competitive than cowpea cv California Black Eye (IRRI 1976). Yield reduction due to weeds in this study was directly related to the weight of weeds growing with the cultivars. Similarly, in a subsequent trial (IRRI, 1979), another cultivar, EG #2, was found to be more competitive than California Black eye. A higher leaf area index was associated with increased ability to compete with weeds.

These studies reported on the influence of applied water on the weed ecology of different crops. The influence of different water table depths on weed ecology has not been reported. The objectives of this study were: 1) to explore the influence of differences in applied irrigation water on the weed ecology of early and medium maturing cowpea cultivars, and 2) to explore the influence of naturally occurring water table depths on the weed ecology of the cultivars.

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