

Effect of Cropping Systems on Productivity of Dryland Crops in Penghu Area

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Abstract

The purpose of this experiment was to find out reasonable rotation pattern and to improve soil fertility by planting rape green manure during fall crop in moderate alkaline soil on Penghu area. The results were summarized as follow :

The experiment of cropping systems was conducted from 1994 to 1997, the experimental results showed that the treatment C, including the spring vegetable, summer sweet corn and fall rape for the first year; spring sweet potato and fall rape for the second year, was the best rotation pattern. However, at the early stage of the spring vegetable soybean may meet the salt-wind, and the summer table corn may be damaged by typhoon seriously. Thus, treatment C may be amended to an annual rotation system, including spring vegetable soybean, summer table corn and fall rape or sweet potato. In addition, for decreasing the damages from wind break, the agroforestry moded developed by the Penghu Branch Station can also be applied.

The rape can be grown as a green manure in winter on Penghu, and it affected the root yield of sweet potato in the following year. For those treatments with growing rape in winter season, the average root yield increase 25.6% over the treatment without planting rape. It indicated that the open field without windbreak should grow rape in winter in order to protect the soil and to increase the soil fertility. Among the treatments with growing rape in winter, it found that certain rotation pattern was better than the continuous cropping.

For weed survey, broad-leaf weeds became the major weeds, mainly because of the self-germinated rape plants replace the traditional weeds in spring field. For soil analysis, the soil pH and EC values were affcted mainly by seasonal environment. In winter, the soil pH and EC values were increasing, and the organic matter was decreasing due to the loss of surface soil by strong winter wind. Thus, it is suggested to grow rape in winter for protecting the soil and incerasing the O. M. and K₂O contents.

Key words: Cropping system, Winter green manure, Penghu area, Vegetable soybean, Table corn, Peanut, Sweet potato, Rape

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