

PA-010**Development of Multiple Upland Crops Cropping System of Paddy Field in the Middle Area of Korean Peninsula**Kang Bo Shim^{1*}, Bon Il Koo¹, Myoung Na Shin¹, Won Tae Jeon¹¹Crop Cultivation & Environment Research Division, NICS, Suwon 126, Korea**[Introduction]**

The first and most important advantage of cropping system is to increase output per area as multiple cropping involves cultivating two or more crops in the same field during one season. The techniques of cropping systems allow farmers to achieve better results by making practical use of resources such as soil, water, fertilizers etc. Various types of crops can be cultivated in mixed cropping practice, such as food crops, vegetables, silage crops. This helps farmers become self-sufficient in food production while also providing them the option to sell additional products for making money. This experiment was conducted to find out optimum multiple cropping system related to economic crops in the central northern area of Korea.

[Materials and Methods]

The experiment was conducted at two different regions, Suwon and Anseong in 2018~2019 using seven crops such as corn, potato, perilla, sesame, onion, garlic etc. Total four two-year three-crops multiple cropping systems such as corn-perilla-onion, potato-sesame-garlic, corn-sesame-onion and single rice cropping system as control are compared in view of cultivation stabilization, manpower reduction and income generation etc.

[Results and Discussion]

According to the results, 'potato-sesame-garlic' cropping system showed relatively higher manpower reduction ratio rather than others. Potato-sesame-garlic, corn-perilla-onion, corn-sesame-onion, rice cropping system showed 96%, 81%, 84%, 82% of manpower reduction ratio respectively. In this study, we analyzed manpower requirement time at sowing and harvest process of each crop. We also compared income generation effect among four different cropping systems. In 2018, potato-sesame-garlic cropping system showed 14,742,000won per hectare of net income which was higher than other cropping systems. Corn-perilla-onion cropping showed 7,508,000won and corn-sesame-onion cropping showed 8,225,000won. In 2019, potato-sesame-onion cropping showed relatively higher net income rather than other cropping systems. Potato-sesame-onion, corn-perilla-onion, corn-sesame-onion, rice cropping systems showed 7,922,000won, 6,627,000won, 6,995,000won, 878,000won per hectare of net income respectively. The reason net income difference between two years was crop's unit price change. Onion unit price dropped from 988won per kg in 2018 to 403won in 2019. Potato unit price also dropped from 2,170won in 2018 to 1,360won in 2019. In two years, average net income per hectare of each cropping system was as follows ; potato-sesame-onion 11,332,000won, corn-perilla-onion 7,068,000won, corn-sesame-onion 7,610,000won, rice 888,000won respectively.

[Acknowledgements]

This study was supported by a grant from the development of multiple cropping system of upland crop for enhancement of paddy field utilization in the middle area of Korean Peninsula (Project No: PJ013887012020), Rural Development Administration. Korea.

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