

Growth and Yield Characteristics of Foxtail Millet (*Setaria italica* BEAUVOIS) and Proso Millet (*Panicum miliaceum* L.) under Different Paddy-Upland Rotation Systems

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[Introduction]

This study was performed to investigate the optimal cropping systems to allow the cultivation of upland crops to the paddy land. This experiment was conducted at Anseong-si Gyeonggi province, Korea from 2013 to 2015. In order to investigate growth and yield characteristics, and select optimum varieties of foxtail millet and proso millet for paddy-upland rotation system, each four varieties of foxtail millet and proso millet were examined under four different paddy-upland rotation systems from 2013 to 2015.

[Materials and Methods]

Four different paddy-upland rotation systems of paddy (2013)-rice paddy (2014)-upland (2015), rice paddy (2013)-upland (2014)-upland (2015), upland (2013)-upland (2014)-upland (2015) and upland (2013)-rice paddy (2014)-upland (2015) system were tested. Testing varieties were 4 in foxtail millet (Samdachal, Samdamae, Kyeongkwon 1ho, and Hwanggeumcho), and 4 in proso millets (Leebaekchal, Chalgijang, Hwangsilchal, and Hwanggeumgjang).

[Results and Discussion]

Days from seeding to heading and ripening of foxtail millet were the shortest in upland (2013)-upland (2014)-upland (2015) system, but proso millet did not show statistical difference between four different rotation systems. In the average of culm length, upland-upland-upland rotation system showed the highest culm length in foxtail millet (141.5cm), proso millet (159.6cm) respectively among four paddy-upland rotation systems. In the yield per 10a among four rotation systems, upland (2013)-upland (2014)-upland (2015) system produced the highest yield (234.3kg/10a), and 85.4% (200.2 kg/10a) was obtained from rice paddy (2013)-upland (2014)-upland (2015) system, 75.2% (176.3kg/10a) from rice paddy (2013)-rice paddy (2014)-upland (2015) system, and 68.7% (161 kg/10a) was obtained from upland (2013)-rice paddy (2014)-upland (2015) system compared to upland (2013)-upland (2014)-upland (2015) system in foxtail millet. Proso millet almost the same trend such as that upland (2013)-upland (2014)-upland (2015) system produced the highest yield (176.2 kg/10a), and 91.5% (161.2 kg/10a) was obtained from rice paddy (2013)-upland (2014)-upland (2015) system, 80.8% (142.4 kg/10a) from upland (2013)-rice paddy (2014)-upland (2015) system, and 79.5%(140kg/10a) was obtained from rice paddy (2013)-rice paddy (2014)-upland (2015) compared to upland (2013)-upland (2014)-und (2015) system.

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