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Effect of Plant Density and Planting Pattern on Yield and Quality of Single Cross 704 Silage Corn (Zea mays L.) in Isfahan

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Abstract : This field experiment was conducted in Isfahan in 2011 in order to study the effect of plant density and planting pattern on growth, yield and quality of silage corn (SC 704) using a randomized complete block design with split plot layout and four replications. The main plot consisted of three planting patterns (60 and 75 cm single planting row and 75 cm double planting row referred to as 60S, 75S and 75T, respectively). The subplots consisted of four levels of plant densities (65000, 80000, 95000 and 110000 plants per hectare). Each subplot consisted of 7 rows, each with 10m length. Vegetative and reproductive characteristics of plants at silking and hard dough stages (when the plants were harvested for silage) were evaluated. Results of variance analysis showed that the effects of planting pattern and plant density were significant on leaf area per plant, leaf area index (at silking), plant height, stem diameter, dry weights of leaf, stem and ear in silking and harvest stages and on fresh and dry yield, dry matter percentage and crude protein percentage at harvest. There was no planting pattern × plant density interaction for these parameters. As row space increased from 60 cm with single planting to 75 cm with single planting, leaf area index and plant height increased, but leaf area per plant, stem diameter, dry weight of leaf, stem and ear, dry matter percentage, dry matter yield and crude protein percentage decreased. Dry matter yield reduced from 24.9 to 18.5 t/ha and crude protein percentage decreased from 6.11 to 5.60 percent. When the plant density increased from 65000 to 110000 plant per hectare, leaf area index, plant height, dry weight of leaf, stem and ear and dry matter yield increased from 19.2 to 23.3 t/ha, whereas leaf area per plant, stem diameter, dry matter percentage and crude protein percentage decreased from 6.30 to 5.25. The best results were obtained with 60 cm row distance with single planting and 110000 plants per hectare.

Keywords : silage corn, plant density, planting pattern, yield
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