

THE EFFECT OF PLANTING ARRANGEMENT AND DENSITY ON PHYSIOLOGICAL INDICES AND DRY MATTER ACCUMULATION OF CORN (SINGLE CROSS 704) IN ISFAHAN

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Introduction: Determining the best density and appropriate sowing pattern is really effective for better use of inputs like soil, water, light and nutrients and cause increases in quality and quantity of yield.

Material and method: To achieve the best plant density and planting arrangement of corn plant, a study was carried out in research farm of Islamic Azad University (Isfahan Branch) as strip plots in randomized complete block design with three replications. Vertical factor was sowing space (50, 60, and 75cm) across blocks and horizontal factor was density (6, 8, 10, and 12 plants/m²) along blocks.

Result and discussion: According to results, density affected leaf area index significantly and increased it. So that, the highest leaf area index was obtained by 12 plants per square meter. Also, reduction in inter row space increased this trait significantly. By less sowing distance plants can use more growth space and their leaves will be extended more, therefore leaf area index will be more. The highest crop growth rate was obtained by 8 plants per square meter but higher densities reduced it. Also, by less row distances, crop growth rate was increased because of uniform distribution of plants. Increasing density increased net assimilation rate because of more light absorption and photosynthesis and twelve plants per square meter had the highest NAR. Reduction in sowing distance decreased NAR but this reduction was faster in end of growth season. It seems that at this time, increase in leaves shading and non-uniform distribution of light in various levels of canopy is the reason of NAR reduction (Bullock et al, 1993). By increasing density until ten plants per square meter dry matter accumulation was increased but after that it decreased because of plant competition. Reduction in row space decreased this trait in all growth stages. Actually, less distances increased it because of better use of extant resources and less inter space competition.

Keywords: planting arrangement, plant density, physiological indices, corn



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