Wheat Grain Yield and Weed Biomass as Affected by Tillage Systems and Management. (A06-acciaresi114922-Poster)

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Abstract:

Soil tillage, herbicide, fertility and weeds are expected to interact strongly as to produce definitive effects on crop growth and yields. Information on the impact of several management techniques, e.g., herbicide rates, fertilizer application and different types of tillage is needed for developing a reliable integrated weed management program. The objective was to assess the effect of two tillage systems and different management inputs of fertilizer and herbicide rates on the yield of wheat varieties and weed biomass. Two field experiments were established at the Experimental Station of La Plata National University (Argentina) during 1999 and 2000. The experiments were arranged as split-split plots design. The whole plot factor consisted of two tillage systems (A), A1: conventional tillage (CT, ploughing-20 cm, disk-harrowing, standard sowing) and A2: zero tillage (ZT, herbicides used to control weeds and straw spread with harrows). The subplot factor consisted of three N levels (B). No N was applied in the low-N treatment areas. In the medium-N treatment areas, urea fertilizer (46 % N, w/w) was broadcast and incorporated at fourth leaf-unfolded stage at rates of 50 kg N.ha-1 in each year. In the high-N treatment area urea was broadcast and incorporated at rates of 100 kg N.ha-1 in each year. The sub-subplot factor was three levels of metsulfuron-methyl plus dicamba (C) (0/0, 3.0/50 and 6.0/100 g a.i.cm-3.ha-1, respectively). Analysis of variance was performed on the data (wheat ADM, wheat GY, wheat ears number and weed ADM) for testing multivariate differences between treatments (A, B and C). There was a higher grain yield (P<0.05) for ZT system compared with CT in one of the two years evaluated. Weed biomass from CT was lower (P<0.05) than from ZT in both varieties. No differences on wheat biomass and grain yield were observed between full and reduced rate of herbicide. N fertilizer increased significantly wheat biomass and grain yield. Only medium-N level had effect upon weed biomass with respect to unfertilized plots, while the highest fertilization rate lowered (P<0.05) weed biomass. Tillage system, herbicide reduced rates and nitrogen

fertilization were an effective way of limiting weed production in Argentinean wheat production systems

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