

SOYBEAN WEEDINESS IN CONSERVATION TILLAGE SYSTEMS

Bojana Brozović¹, Irena Jug¹, Boris Đurđević¹, Iva Rojnica², Marija Ravlić¹, Vesna Vukadinović¹, Danijel Jug¹

¹ Josip Juraj Strossmayer University of Osijek, Faculty of Agrobiotechnical Sciences Osijek, Vladimira Preloga 1, 31000 Osijek, Croatia (bojana.brozovic@fazos.hr)

² Križevci University of Applied Sciences, Ul. Milislava Demerca 1, 48260, Križevci

Abstract

The experiment with conservation tillage and fertilization was set up in Čačinci (17.86336 E, 45.61316 N, 111 m) on Stagnosol soil type in 2022 with the aim of determining the influence of conservation soil tillage and fertilization on the weed status of soybean. The experiment was set up as a split plot design in three replications where the main treatment was soil tillage, and the sub-treatment was fertilization. Soil tillage treatments were: conventional tillage - ST (plowing up to 30 cm depth); deep conservation tillage (loosening up to 30 cm depth) with a minimum of 30% of crop residues - CTD); shallow conservation tillage (loosening up to 10 cm depth) with a minimum of 50% of crop residues - CTS). Fertilization included treatment F - recommended (40:150:94 NPK and 40 kg N ha⁻¹) and HF - reduced by 50%. Weed assessment was carried out by weeds sampling in V3 (three trifoliolate) and R7 (beginning maturity). The weed density, above-ground biomass, the number of weed species and weed coverage were determined at each treatment and sub-treatment. All classified weed species on the area of 0.25 m² in four repetitions were counted and cut off on the ground level, separated by different weed types and dried at 60 °C for 48 h and weed coverage was determined visually. Tillage had a significant effect ($p < 0.05$) on weed

biomass, weed density and weed coverage at V3 soybean growth stage (critical weed free period). Average weediness was the highest on CTS conservation tillage system. Average weed biomass was almost three times higher (9.74 g m⁻²) on CTS treatment compared to ST (3.42 g m⁻²) while the weed coverage was more than 50 % higher (36.34 %). The highest weed density (50.33 m⁻²) and coverage (38.67 %) were recorded on the CTS treatment with HF. The parameters of weediness in R5 growth stage were on average the highest on CTS treatment with significant statistically difference ($p < 0.05$) compared to ST which had the least average weediness. Fertilization had a significant effect on average weed density and number of weed species with the highest values on treatment HF; (25.89 m⁻²) and (4.22 m⁻²). CTS treatment with HF had the highest weed species number (6.67 m⁻²) and weed cover (42.33%) with statistically significant differences compared to ST/HF while the highest total weed density (32 m⁻²) was recorded on CTD/HF. The shallow conservation tillage system and reduced fertilization in average led to an increase in soybean weediness.

Key words: *Glycine max* (L.) Merr., weed assessment, conservation tillage

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