
Impact of Crop Residue Mulches and Nitrogen Sources on Weeds and Productivity of Wheat

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Abstract

Returning of allelopathic crop residues as mulches to soil may be one of the best management strategy to manage weeds and sustain the productivity on long term basis. A 2-year study was conducted to investigate the influence of residue mulches of different crops known for having allelopathic potential under different nitrogen sources on weeds and productivity of wheat. The experiment consisted of four mulches (plastic, wheat straw, rice residues, sorghum residues) each applied at 4 tons/ha, and three nitrogen (N) sources (Urea, calcium ammonium nitrate, ammonium sulphate) applied at the rate of 125 kg/ha. All the mulches significantly reduced the density and dry biomass of weeds. Maximum suppression in weeds density and dry biomass was observed with plastic mulch. Highest suppression in broad leaved weed density and dry biomass was observed with wheat mulch followed by sorghum and rice mulch over control. For narrow leaved weeds, maximum reduction of density and dry biomass was observed in wheat mulch over control followed by sorghum mulch, while, minimum suppression in density and dry biomass was observed with rice mulch over control. Total weeds density and dry biomass was also affected with the allelopathic crop residue mulches. Maximum reduction in total weed density and dry biomass was observed with wheat mulch over control followed by sorghum and rice mulch. Nitrogen sources also affected grain yield significantly. Maximum yield improvement was observed when calcium ammonium nitrate was applied and that was statistically similar with ammonium sulphate application. We observed a strong negative correlation of grain yield and water soluble phenolics with the density and dry biomass of weeds. In crux, the use of allelopathic crop residue mulches in combination with the mineral nitrogen fertilizer might be a pragmatic option to control weeds and improve the wheat productivity.

Keywords: Weed dynamics, wheat, crop residues mulch, allelopathy

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