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Allelopathic effect of greengram crop residue on germination and early growth of safflower

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Crops through their residues, both root and shoot parts, do affect germination, crop establishment and growth of following Crops in a given cropping sequence. The outcome here could be positive or negative depending upon the type of crop that precedes, and the type and extent of allelochemicals present in its residues. On medium and deep black soils of northern Karnataka under rainfed conditions green gram followed by rabi crops is an extensively followed cropping sequence. Although leguminous crop like greengram is known to benefit following crop via N-fixation, information is lacking if green gram crop residues have any simulative or inhibitive effect on the germination and early vigor or establishment of *rabi* crops, especially safflower.

Therefore, a pot study filled with pure sand was carried out during kharif season of 2014 at AICRP (safflower), ARS, Annigeri, Karnataka. Treatments included four levels of crop residue: control (no residue), 550g, 1100g and 1650g of crop residue per pot replicated thrice and the residue was mixed on the top layer of sand left for decomposition for 3 weeks before 20 seeds of safflower were sown in each pot. All the pots were regularly watered to keep the moisture at field capacity. Germination pattern was recorded on daily basis and seedling height, number of leaves and biomass was measured thrice during 30 days.

Addition of greengram crop residue reduced the germination, on average, by 10% across treatments compared with control. In contrast, seedling height, number of leaves and biomass accumulation consistently across three samplings dates (15, 20 and 30 days after sowing) increased with increasing levels of crop residue addition, compared with control. This suggests that further detailed studies needs to be taken up to identify what kind of chemicals present in greengram crop residue affect germination and enhance seedling growth and biomass accumulation in safflower. However, inhibitive effect of greengram crop residue on germination could be overcome by increasing the sowing seed rate of safflower by at least 10% to compensate for the expected reduction in germination due to presence of greengram residue in the field at sowing.

Biography

Raveendra H Patil, also internationally known by the name Dr. Ravi Patil obtained his BSc (Agricultural Sciences; 1990-94), First Rank to the University (Four Gold Medals), MSc (Agronomy; 1994-96), First Rank to the University (Two Gold Medals), and PhD (Agroforestry Systems 1997-2000) from the University of Agricultural Sciences, Dharwad, India (www.uasd.edu). As an outstanding student Dr. Patil received University Merit Scholarship for B.Sc. degree program, ICAR Junior and Senior Research Fellowships for M.Sc. and PhD, respectively, and ASPEE R&D, Mumbai research fellowship for M.Sc. degree program. Soon after completing PhD, he joined UAS, Dharwad as Assistant Professor in Feb. 2000. Since then he has carried out teaching, research and extension activities at different campuses of the UAS Dharwad.

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