OPTIMIZING COVER CROP OVERSEEDING FOR IRRIGATED CONTINUOUS COTTON IN THE MISSISSIPPI DELTA

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Abstract

Cover crops provide multiple benefits including preventing soil erosion by providing soil cover, increasing water infiltration into the soil which will decrease irrigation runoff, increasing soil organic matter by providing plant residues, reducing nitrate leaching and nutrient loss in the soil profile and thus, improving the water quality. A field experiment was started in fall 2019 to evaluate the effect of overseeded cover crops on cotton lint yield, cover crop biomass production, and its CN ratio. The cover crop species included in the study were: cereal rye, crimson clover, hairy vetch, radish, wheat, hairy vetch + radish mix, cereal rye + crimson clover mix, wheat + crimson clover mix, wheat + radish + turnip mix. An untreated check without any cover crop was also included. Cover crop seeds were overseeded after harvest of the preceding crop by broadcasting seeds using a handheld spreader. Cover crop biomass was randomly collected from each treatment before chemical termination of cover crops in spring 2020. The collected biomass of cover crop was oven-dried at 60ºC and weighed for dry matter production. The dried cover crop biomass was grounded using a Thomas Scientific Wiley Mill, passed through a 1 mm sieve, and analyzed for total carbon and nitrogen. Cotton was planted after the termination of cover crops in May 2020 and will be harvested in October. All cover crops treatments had greater biomass production and N uptake than the untreated check (854 kg ha^{-1}, 13 kg N ha^{-1}). Among cover crop treatments, the highest and lowest biomass was produced by wheat + radish + turnip mix (4623 kg ha^{-1}) and crimson clover (1153 kg ha^{-1}), respectively. Cotton lint yield was highest in the untreated check, which was not significantly different from lint yield from cereal rye, cereal rye + crimson clover mix, crimson clover, hairy vetch, radish, and wheat + crimson clover mix. Hairy vetch + radish mix and wheat resulted in lower cotton lint yield than other cover crop treatments in this study.