INITIAL EFFECT OF COVER CROP SPECIES AND SEEDING RATE ON TEXAS DRYLAND COTTON PRODUCTION

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Abstract

Soil health has become an increasingly important area of emphasis in land management, particularly agricultural land management. Environmental and climatic conditions vary greatly across Texas, which may require region specific guidelines for cover crop management and subsequent modification of NRCS Conservation Practice Standard 340 (Cover Crop). The current NRCS CPS 340 states "seed a higher density cover crop stand to promote rapid canopy closure and greater weed suppression. Through a survey of diverse producers across the US, survey respondents were most likely to see the cost of cover crops as always limiting the adoption of cover crops in their area. Thus, it is imperative to determine optimum seeding rates that will produce the most optimum herbage mass to enhance N availability, weed suppression, potentially grazable forage, ground cover, and other soil health benefits. The objective of this study is to determine optimal seeding rates of broadly adapted cover crop species to produce herbage mass that enhances soil health while not negatively impacting crop productivity economic returns. This study was conducted at the Texas A&M AgriLife Chillicothe Research Station. Four cover crops species were evaluated at four seeding rates. Treatments included a control, hairy vetch, Austrian winter pea, winter lentil, and cereal rye. Seeding rates included 0.25, 0.5, 1, and 1.5x seeding rates. For example, evaluated seeding rates for rye and pea were 15, 30, 60, and 90 lbs./ac. Cover crops were planted after cotton harvest. Prior to cover crop termination, herbage mass was determined by clipping plots and drying to obtain dry matter. Cotton was harvested each year from the middle two rows of four row plots. In the initial two years, no significant differences were observed among seeding rates for rye, hairy vetch, or Austrian winter pea. No differences were observed among seeding rates for lentil in 2019, although the highest seeding rate (2x, 60 lb./ac) resulted in significantly greater herbage mass in 2020. Cotton lint yields were not affected by seeding rates for rye, hairy vetch, and lentil for each year. Lint yields were greater for the 0.25x rate of pea in 2020 and lower for the 1.5x rate of pea in 2019. Lint yields were not significantly different among treatments than the control in 2019, although all treatments resulted in numerically lower lint yields than the control in 2020. Initial results indicate that seeding rates below recommended "full" seeding rates may be used to provide optimum cover crop production, which could substantially reduce input costs of implementing cover crops.