EVALUATION OF THE EFFICACY AND PROFITABILITY OF SEED TREATMENT AND IN-FURROW NEMATICIDES IN VIRGINIA COTTON S. Ahmed H. L. Mehl Virginia Tech Tidewater AREC Suffolk, VA

Abstract

Planting in nematode-infested fields results in significant crop damage and yield loss throughout the cotton belt, including in southeastern Virginia. Aldicarb was the preferred nematicide in cotton for over 30 years, but currently, availability of this active ingredient is limited. Both in-furrow and seed treatment nematicides are currently available for cotton, but the efficacy and profitability newer products (e.g. Velum Total) needs to be evaluated. The objective of this study was to quantify impacts of seed treatment and in-furrow nematicides on nematode populations, plant growth, and cotton yields in fields varying in nematode pressure in southeastern Virginia, USA. Seed of Phytogen 499 WRF was planted in three different locations in May 2016. Seed treatments (fungicide base only or Aeris SAS) and in-furrow treatments were applied in a factorial randomized complete block design with four to six replicates. In-furrow treatments included the insecticide Admire Pro (imidacloprid) at 8.5 oz/A, the insecticide/nematicide product Velum Total (imidacloprid + fluopyram) at 10, 14, or 18 oz/A, and an untreated control (no in-furrow product). All other agronomic practices (e.g. fertilizer, weed control) were according to standard Virginia recommendations for cotton production. Nematode populations were quantified from each plot prior to planting, mid-season, and at harvest. Three different genera of nematodes known to be economically important on cotton were detected. Trichodorus spp. (stubby root nematode) was detected at first location, stubby root nematode and Meloidogyne incognita (Southern root knot nematode) were detected at second location, and Belonolaimus spp. (sting nematode) was detected at the third location. The population of stubby root nematode increased 20 and 14 times at mid-season and harvest, respectively, compared with the pre-plant population at the first location; and 1.6 and 1.8 times at mid-season and harvest, respectively, compared with pre-plant population at the second location. At the second location, M. incognita increased 5 and 8 times at mid-season and harvest, respectively, compared with pre-plant population. Sting nematode was not detected at the third location until mid-season, and the population increased by a factor of 5 at harvest. No significant differences in nematode population numbers were detected among treatments, but in-furrow treatments of Velum Total reduced severity of root damage due to nematode feeding at the third location. Stand counts did not vary among treatments, but both seed (P=0.0128) and in-furrow (P=0.0003) treatments increased early season plant vigor across all three locations with the Velum Total 18 oz plus Aeris seed treatment resulting in the highest vigor. Overall, yields were significantly different among the three locations with an average of 2390, 2260, and 1023 lb/A seed cotton harvested from the first, second, and third location, respectively (P < 0.0001). A significant yield response to seed (P = 0.0158) and in-furrow (P = 0.0161) treatments was only detected at the second location where the field was infested with Southern root knot nematode. Aeris seed treatment plus Velum Total at 14 or 18 oz/A yielded higher than the base seed treatment plus no infurrow treatment control by 608 and 735 lb/A, respectively. All other treatments did not differ from the untreated control. Results of this study indicate seed treatment and in-furrow nematicides increase early season vigor and decrease root damage from nematodes, but this does not always result in a significant yield response. This study and others conducted in southeastern Virginia suggest Aeris SAS and Velum Total are most likely to provide a yield benefit, and therefore be profitable, in fields with moderate to high Southern root-knot nematode pressure.