IDENTIFYING NEMATODE MANAGEMENT ZONES WITHIN THE FIELD: UTILITY OF ELECTRICAL CONDUCTIVITY, AERIAL IMAGING AND YIELD MONITORS

Nathan Foster
Texas Tech University
Lubbock, TX
Jason Woodward
Texas A&M AgriLife Extension and Texas Tech University
Lubbock, TX
Glen Ritchie
Texas Tech University and Texas A&M AgriLife Research
Lubbock, TX

Abstract

Meloidogyne incognita is an economically important pest of cotton throughout production regions of the U.S. Cotton Belt. In the Texas High Plains, *M. incognita* has been recovered from 42 to 77% of the fields sampled. It is known that nematode populations are sporadic within fields due to variations in soil physical properties, crop type and environmental conditions. Several methods, such as soil survey, soil electrical conductivity, aerial imaging, and yield monitoring, are currently available and can be used to aid in site-specific management of root-knot nematodes. Soil survey information is readily available and free of cost. Users can access soil survey data through a local NRCS office or online. Aerial imagery can be obtained via LANDSAT, NAIP (National Agriculture Imagery Program), UAV, as well as other sources. Soil electrical conductivity gives an indication of soil variability. Greater EC values are measured in soils with finer or heavier soil textures and lower EC values are measured in soils in coarse or light textured soils. Recently, the use of yield monitoring systems on cotton strippers has become more popular and affordable. A field study was initiated in 2014 to identify nematode management zones in a field located in Hockley County, Texas. Soil survey results revealed a total of six different soil types within the test location ranging from light sandy soils to heavier textured clay soils. Composite LANDSAT images collected from the early 2000s to 2013, where it is used to characterize crop growth throughout the field. A comparison of the two maps revealed continuity in several areas, with strong correlations between poor growth and areas of the field containing a Drake soil type. Severe nematode galling was observed on roots from plants collected in this area. Furthermore, yields were greatly reduced in these areas. In addition, reduced yields and lower NDVI values obtained from NAIP images retrieved from within the growing season, corresponded with an area (approximately 20 acres) where corn was grown the previous year. This information in conjunction with EC mapping has been used to identify different management zones, where systematic sampling will be conducted. The overall goal of this work is to identify areas within fields, which will allow producers to reduce the amount of nematicides applied for nematode control and lower production costs.