IDENTIFYING ROOT-KNOT NEMATODE AREAS IN COTTON USING SOIL ELECTRICAL CONDUCTIVITY

Charles Overstreet1, Gene Burris2, Don Cook2, E.C. McGawley1, Boyd Padgett2, and Maurice Wolcott1
LSU AgCenter, 1Department of Plant Pathology, Baton Rouge, LA and 2Northeast Research Station, Winnsboro and St. Joseph, LA

Results

Introduction

The Veris 3100® EC mapping system was found to be an especially effective tool for delineating soil texture in the Mississippi alluvial soils evaluated in this study. Clay content was highly correlated with ECa-sh (R² = 0.89). Root-knot nematode was present in the Gin Ridge site but limited to areas which generally had ECa-sh readings of <30 mS/m and clay content of 18% or less (Figure 3). A number of additional fields were included in the study to show the relationship between root-knot nematode and texture as defined by ECs (Figures 4-7). Figures 8a & b shows typical nematode damage in one of the low ECa-sh areas in a cotton field.

Methods

The initial field evaluated (Gin Ridge site) was a typical alluvial soil that had a wide range of soil textures from very fine sand to clay. A Veris 3100® soil mapping system (Figure 2) was used to measure apparent electrical conductivity (ECa) at 0-1’ (30 cm) and 0-3’ (91 cm) depth, ECa-sh and ECa-dp respectively, throughout this field. The field was divided into 1 acre (0.4 ha) grids and nematode samples collected from the dominant ECa-sh class within each grid. A number of additional fields were included in the study.

Discussion

The alluvial soils of Mississippi River can be characterized by the use of ECa into a number of classes or natural breaks. Root-knot nematode occurred in the classes which had the lowest readings (mS/m). Producers could take this information and develop treatment areas for their fields. In the fields included in this study, the areas of the field that would not require treatment with a nematicide ranged from 34-57% (Table 1). This could result in considerable saving to the producer and reduced amounts of pesticides applied to manage nematodes.

Table 1. Potential saving in a nematicide such as 1,3-dichloropropene (Telone) in the test fields in this study.

<table>
<thead>
<tr>
<th>Test field</th>
<th>Entire field ($)</th>
<th>Specific area ($)</th>
<th>Savings ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cemetery South</td>
<td>2476</td>
<td>1368</td>
<td>1108</td>
</tr>
<tr>
<td>Cemetery North</td>
<td>948</td>
<td>624</td>
<td>324</td>
</tr>
<tr>
<td>Gin Ridge</td>
<td>3148</td>
<td>2072</td>
<td>1076</td>
</tr>
<tr>
<td>Ken’s Corner</td>
<td>3292</td>
<td>1428</td>
<td>1864</td>
</tr>
<tr>
<td>Roger Carter</td>
<td>2832</td>
<td>1320</td>
<td>1512</td>
</tr>
</tbody>
</table>

Telone costs are ca. $40 per acre.

Acknowledgements

Glen Daniels, County Agent (Concordia Parish)
Robert Goodson, former County Agent (Tensas Parish)
Roger Carter and Tim White, Crop Consultants and Producer
Ben and Billy Guthrie, Panola Plantation
David Sullivan, Real Agricultural Management, L.L.C.
E.P.A. Region 6 for partial funding