**Background and Site Information**

*Operator Information*
Operator name: __________________________
Farm number: ___________________________
Tract number: __________________________
Crop rotation: __________________________

*Site Overview, History and General Management*
The 900 acre farm is located in Collier County, Florida. There are 450 acres in vegetable production. The remaining acres are a mix of roads, pastureland, and cypress stands. Two different citrus groves border the property as well as wetlands with cypress stands.

This farm primarily grows tomatoes, peppers, cucumbers, and watermelons. The growing season begins in August and runs continuously until the beginning of May. The tomato varieties are a mix of different round varieties including Florida 47. The peppers are a mix of bacterial spot resistant bell pepper varieties. The primary cucumber variety is Poinsett, and watermelons are a mix of different seedless varieties.

Many pests and diseases that affect vegetables thrive in this region. The silver-leaf whitefly is the primary pest of the tomatoes, primarily because it vectors Tomato Yellow Leaf Curl Virus. Different species of armyworms and leafminers are also important pests. The most important disease is bacterial spot, along with target spot, early blight, and late blight. The pepper weevil and different types of worms are the most important pests of peppers. Downy mildew and powdery mildew are important diseases for both cucumbers and watermelons.

The farm has been family-owned and in production since 1972. Fifteen years ago the current owner gained sole ownership from his brother. The property has largely been unchanged for 25 years.

**Resource Concerns**
This conservation plan considers whole farm systems planning to identify management strategies and mitigation practices to resource concerns relating to Integrated Pest Management (IPM) and other activities. The primary environmental concerns are leaching and transport of nutrients and pesticides.

**History of Pest Management Activity**
The grower uses a calendar spray program but wants to transition to IPM, with sprays based on scouting reports and thresholds. In addition, the grower wants to end the use of organophosphate and carbamate pesticides and make use of newer and less toxic chemistries.
Maps and Descriptions
Refer to the attached maps. Soil types, surface waters, wetlands, and wells are included.

1. Conservation Map 1
2. Conservation Map 2
3. NRCS Soil Map

Tract: Legal Description
Township: 47 S  Range: 29 E  Section: S7

Field 1  Acreage: 15  Primary Soils: See map
Field 2  Acreage: 35  Primary Soils: See map
Field 3  Acreage: 52  Primary Soils: See map
Field 4  Acreage: 50  Primary Soils: See map
Field 5  Acreage: 40  Primary Soils: See map
Field 6A  Acreage: 18  Primary Soils: See map
Field 6C  Acreage: 11  Primary Soils: See map
Field 7  Acreage: 51  Primary Soils: See map
Field 8  Acreage: 48  Primary Soils: See map
Field 9  Acreage: 28  Primary Soils: See map
Field 10A Acreage: 25  Primary Soils: See map
Field 10B Acreage: 20  Primary Soils: See map
Field 11  Acreage: 22  Primary Soils: See map
Field 12  Acreage: 35  Primary Soils: See map

Field Acreage: 450
Total Acreage: 900

Environmental Risk Assessment
Soils Description
The primary soils of this farm are Immokalee fine sand and Wabasso fine sand, making up 73% of the area. These sandy soils are deep, highly permeable, and highly susceptible to wind erosion. The K factor for all the soils of this farm is 0.10, K factor ranges from 0.02 to 0.69. (The higher the number, the more susceptible the soil is to sheet and rill erosion.) The T factor estimates the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity. The T factor for the primary soils of this farm is 5. These soils are some of the most tolerant in erosion losses in respect to productivity. The primary concern of erosion regarding these soils is nutrient and pesticide pollution from soil particles and solution into canals and carried off-site. The vast majority of these soils have no water restrictive layers within 2 meters of depth which allows for downward leaching of dissolved nutrients and pesticides into the groundwater. As shown in WIN-PST1, there are environmental risks associated with some of the pesticides that have been applied at this farm in the past.
Land Use and Description
The farm consists of 14 fields. A system of canals provides drainage, and there are eight wells to provide irrigation water for the newly installed drip irrigation system. The farm is bordered by cypress dominated forest to the west and a mixture of pastureland and wooded areas to the north and the east. Water from the canals eventually drains into the forested area to the west, which borders a lake. Citrus groves border the southern fields of the farm and are also present within the property, although operated by another individual.

Management Practices
In the past year, the following pesticides were applied: methyl bromide, methomyl (Lannate), methadimorphos (Monitor), β-cyfluthrin (Baythroid), abamectin (Agrimek), acetamiprid (Assail), glyphosate (Roundup), and paraquat (Gramoxone).

Paraquat is sprayed on the crops after harvest. During the fallow period, the fields are disked every 3 weeks for weed control. Glyphosate is sprayed on the ditch and canal banks. A microirrigation system was installed one year ago and has decreased the amount of water needed for production. A series of windbreaks consisting of sugar cane is maintained along the north-south borders of fields in the most open areas of the property.

Pesticide Resistance Concerns/Management
Pesticide resistance has been demonstrated for most of the pesticides used by this farm. A more modern spray system with newer and alternating chemistries is desired.

Monitoring Guidelines
Pest History
The pests and diseases shown below have a history of quickly manifesting into economic damaging levels. The calendar spray program resulted in application of pesticides at a frequency of three times a week in some cases.
### Insect & Diseases

<table>
<thead>
<tr>
<th>Crop</th>
<th>Insect</th>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato</td>
<td>Silverleaf Whitefly</td>
<td>Bacterial Spot</td>
</tr>
<tr>
<td></td>
<td>Southern Armyworm</td>
<td>Tomato Yellow Curl Virus</td>
</tr>
<tr>
<td></td>
<td>Tomato Fruit Worm</td>
<td>Target Spot</td>
</tr>
<tr>
<td></td>
<td>Leafminer</td>
<td>Late Blight</td>
</tr>
<tr>
<td></td>
<td>Spidermite</td>
<td></td>
</tr>
<tr>
<td>Pepper</td>
<td>Beet Armyworm</td>
<td>Anthracnose</td>
</tr>
<tr>
<td></td>
<td>Southern Armyworm</td>
<td>Bacterial Spot</td>
</tr>
<tr>
<td></td>
<td>Pepper Weevil</td>
<td></td>
</tr>
<tr>
<td>Watermelon</td>
<td>Fall Armyworm</td>
<td>Powdery Mildew</td>
</tr>
<tr>
<td></td>
<td>Southern Armyworm</td>
<td>Downy Mildew</td>
</tr>
<tr>
<td></td>
<td>Spidermite</td>
<td>Vine Decline</td>
</tr>
<tr>
<td>Cucumber</td>
<td>Pickle Worm</td>
<td>Powdery Mildew</td>
</tr>
<tr>
<td></td>
<td>Spidermite</td>
<td></td>
</tr>
</tbody>
</table>

### Pest Scouting, Monitoring, and Control Strategies

Specific strategies and protocol for monitoring and control are outlined in the “Grower’s IPM Guide for Tomato and Pepper Production.” The grower has hired a local agricultural consulting company which promotes IPM. The consulting company developed their protocol in concert with the University of Florida IPM guidelines and their own research. Scouting will be done on a biweekly basis with a written report provided. In addition, pheromone traps for the Tomato Fruit Worm and Pepper Weevil will be maintained. Their location will be moved according to crop stage and field location. Spray decisions will be based on thresholds developed by the consultant using IPM principles. Reduced-risk pesticides will be used as much as possible in place of older, broad spectrum pesticides.

The grower will use recommendations on variety selection, fertilizer rates, and other management techniques from the “Grower’s IPM Guide to Florida Tomato and Pepper Production” and the crop profiles for watermelon and cucumber provided on the web at http://ipm.ifas.ufl.edu.

### Record Keeping

Records will be kept on disease and pest levels and spray applications throughout the season. Both of these services will be provided by the IPM consulting company. In addition, the grower will maintain a record of weather and groundwater conditions. These records will detail:

A. Date of monitoring/scouting
B. Identification and level of disease
C. Identification and degree of infestation of pests
D. Identification and level of weed infestation
E. Identification of beneficials
F. All pesticide applications
G. Strategies implemented with dates
H. Weather and groundwater level
I. All records required by state and federal laws
J. Records required or needed as part of the state University IPM guidelines being used

Conservation Plan

Mitigation Practices to Reduce Environmental Risk

The following mitigation practices should be installed to reduce the risk of nutrient and pesticide pollution.

Integrated Pest Management (595): this will reduce the pollution load by nearly eliminating the use of highly toxic pesticides. It will also reduce the risk to on-site beneficial species. The attachment WIN-PST2 shows the environmental risks associated with newer chemistries of pesticides. Comparing these with the older, more conventional pesticides used on this farm until now (WIN-PST1) shows that newer chemistries pose much lower risk to the environment. In addition, spraying based on actual environmental conditions for diseases and pest action thresholds provided by scouting will reduce the amount of pesticide applications in most cases. Careful record keeping will help ensure the alternating of chemistries to reduce the risk of resistance developing in both the pests and diseases. The grower will also apply the fertilizer rates recommend in the “Grower’s IPM Guide to Florida Tomato and Pepper Production” and the crop profiles for watermelon and cucumber to minimize leaching of nutrients.

Filter strip (393): install to border the areas of the fields that drain into open shallow ditches eventually leading to the canal. This will prevent excess soil erosion and pollution. These should be installed on the east side of fields 6, 11 and 12, the west side of fields 10A and 10B, the south side of fields 9, 7, and 4, the north side of fields 5 and 8, and in the interior of field 3.

Cover Crop (340): cover crops should be planted in all fields after harvest and clean up. This will reduce erosion from water and wind, capture and recycle or redistribute nutrients in the soil profile, and suppress weeds.

Attachments:

1. Conservation Map 1
2. Conservation Map 2
3. NRCS Soil Map
4. WIN-PST1
5. WIN-PST2

Additional Resources

1. “Grower’s IPM Guide for Florida Tomato and Pepper Production.”
NRCS Soil Map

Map Unit Legend

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Immokalee fine sand</td>
<td>430.6</td>
<td>36.7%</td>
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<tr>
<td>15</td>
<td>Pomolo fine sand</td>
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<td>0.9%</td>
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<tr>
<td>16</td>
<td>Oldsmar fine sand</td>
<td>90.7</td>
<td>7.9%</td>
</tr>
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<td>17</td>
<td>Baskin fine sand</td>
<td>28.9</td>
<td>2.4%</td>
</tr>
<tr>
<td>18</td>
<td>Riviera fine sand, limestone substratum,</td>
<td>24.3</td>
<td>2.1%</td>
</tr>
<tr>
<td>21</td>
<td>Boca fine sand</td>
<td>3.4</td>
<td>0.3%</td>
</tr>
<tr>
<td>22</td>
<td>Chokee, Windea, and Gator soils, depressional</td>
<td>31.6</td>
<td>2.5%</td>
</tr>
<tr>
<td>25</td>
<td>Boca, Nokomia, limestone substratum, and</td>
<td>2.4</td>
<td>0.2%</td>
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<tr>
<td>27</td>
<td>Copeland fine sands,</td>
<td>82.5</td>
<td>7.0%</td>
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<td>29</td>
<td>Waldoosa fine sand</td>
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<td>31</td>
<td>Hiloa, Jupiter, and Margulae fine sands</td>
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<td>37</td>
<td>Tuscawilla fine sand</td>
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<tr>
<td>43</td>
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<tr>
<td>69</td>
<td>Water</td>
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<td></td>
<td>Totals for Area of Interest</td>
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