**Improvements**

**Depth Control**
- Quick clip design for quick and easy adjustment for cone depth
- Heavy duty design of feet supports
- Fiberglass protectant on bottoms of the depth control to prevent tears
- Longer and more durable design of cone
- Improve guide travel system to prevent cylinders and feet from turning
- Cones are easily interchangeable from cylinder to cylinder

**PTO Driven Compressor vs. Hydraulic Driven**
- Use of PTO instead of hydraulic motor
- Self-contained machine
- PTO pulley ratios are such that the tractor can operate at a low rpm and travel speed
- Allows for quick attach and detach

**Frame**
- Complete angle iron frame
- Compact for storage, but still sufficient for housing all components necessary for operation
- Heavy duty for withstanding field conditions and time
- Heavy enough to push cones into the ground without bouncing the machine
Improvement of the Auto-Dibbler
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Agricultural Systems Management
Senior Capstone Project
April 17, 2008

Problem Statement:
Various crops require different spacing and depth, and current machines are not easily interchanged from one crop species to another. The dibblers that are interchangeable are usually operated and moved manually by human labor. Spacing and depth accuracy is only as good as the person operating the dibbler. An automated prototype has been designed but still not commercially viable.

Objective:
- Design, build, and test a dibbling machine that is commercially viable and cost effective
- Make machine easily transferable from one tractor to another
- Keep horsepower requirements low to attract targeted customers within the horticultural industry
- Improve depth control of dibblers
- Lower cost of electrical controller
- Create "jack stands" to facilitate mounting and dismounting when storing

Purpose of an automated dibbling machine
- Provide accurate placement of holes in plastic
- Puncture holes in plastic without tearing the plastic
- Easily changed to any crop configuration within a 30" plastic bed
- Increased acres/day, in turn increase farm productivity
PLC
- Use a lower cost controller that can perform the same tasks
- Control system that the operator can control depth and spacing from the tractor seat
- New PLC and wiring allows for quick implement detachment from tractor by minimizing wire harnesses disconnection to only one

Air consumption model was used to design the air compressor and driveline system. The model was also used to determine:
- Constants for PLC timing and intervals
- Pressures at which the systems operates
- Tractor travel speeds
- Compressor Hp requirements
- Pulley ratios

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Air Consumption Model

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<th>Input</th>
<th>Values</th>
<th>Units</th>
<th>Values</th>
<th>Units</th>
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<td>125</td>
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<tr>
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<td>12</td>
<td></td>
<td>24</td>
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<td>1.5</td>
<td>in</td>
<td>1.5</td>
<td>in</td>
<td>1.5</td>
<td>in</td>
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<td>10</td>
<td>in</td>
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<td>in</td>
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<tr>
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<td>in</td>
<td>0.5</td>
<td>in</td>
<td>0.5</td>
<td>in</td>
<td>0.5</td>
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</tr>
<tr>
<td>displacement of compressor</td>
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<td>cu in/stroke</td>
<td>35</td>
<td>cu in/stroke</td>
<td>35</td>
<td>cu in/stroke</td>
<td>35</td>
<td>cu in/stroke</td>
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<tr>
<td>horizontal distance with action</td>
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<td>in</td>
<td>2</td>
<td>in</td>
<td>2</td>
<td>in</td>
<td>2</td>
<td>in</td>
</tr>
</tbody>
</table>

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Four post dismount system
- Four telescoping feet
- Removable or elevated for operation
- Easily adjusted for multiple tractor hitch heights

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