Singer Farms Case Study
on Plum Pox Potyvirus

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Objectives:

• Create precision maps of Singer Farms to find the actual acres of crop land of all crops. Using Farm Works to import boundaries and aerial photographs.

• Research mechanical harvester(s) of proposed crop replacements of high bush Blueberry, Grape and high density Sour Cherry. Research focused on one harvester for all three crops. Secondly on harvesters for each crop individually.

• Create or obtain a partial budget costing model of the proposed crop plantings that will replace the removed Prunus.

Conclusions:

Harvesters
Our search for a machine capable of handling grapes, blueberries, and sour cherries came up empty. We concluded it may be best to find a contracted grape harvester and focus on a blueberry/sour cherry harvester. A general rule with mechanical pickers is to go with a self-propelled model on a farm with 10+acres. For fresh market berries, a rotary head device is a must. Korvan, BEI, and Littau all meet the parameters of Singer Farms and are rotary head systems. Of these 3 companies Korvan was most popular (Korvan 8000) and had the closest dealership.

Maps
We defined the boundaries for accuracy. Imported the USDA images for greater clarity compared to the Terra Server images. This has already been used to gain organic certification. It has also been used to assist irrigation engineers for the irrigation that will be installed for the new crops. After reviewing the acreages that were given to us by Singer Farms we have found that there are 23 more acres than they have in their records.

Partial Budgets
The partial budgets was designed to allow the user to interface with the spreadsheets. This allowed the user to update any part of their information and see their results in real time. The current setup has data from Cornell Cooperative Extension publications, Michigan State University Cooperative Extension and Some information from Singer Farms.
Harvesters:
It is possible to use one machine to harvest grapes and berries. However, the quality and plant health problems this would cause is not economically feasible. Custom harvesters can also be built but this would cost at least $250,000. There are no harvesters stating the capability to handle our 3 proposed crops. Dr. Bordelon, of Purdue Horticulture Dept., was a main resource. Together we decided the farm should look at rotary type harvesters if Singer Farms wants fresh market berries and cherries.
The boundaries were collected using a Trine unit with WAAS Differential and a IPAQ unit with Farm Works Site Mate. Each field had to be collected separately and imported into Farm Works Site. The collecting of boundaries took roughly 45 hours. The fields were divided into each farm and added the crop and year of planted. Comparing our acres collected with GPS to Singer Farms acre spreadsheet that is based on tree spacing to calculate acres we found that there were 23.5 more acres of cropland than previously thought.

USDA Aerial photographs used on top of teraserver. Teraserver images are roughly 10 years old and less pixels per square inch.

These maps have already been used by Singer Farms to certify its organic orchards and sent to an irrigation contractor to figure out the water needs of new plantings.

The images were obtained from the USDA by requesting them online. Once we received them we then opened it with Arc Map to crop the large image so that it was manageable for Farm Works. To do this we zoomed to a specific field and exported it as a geo-referenced image. This allowed us to add the image to Farm Works and have it line up correctly. To add the image to Farm Works we clicked on a field and said to add as a background image. It then needed to know what kind of coordinate system the image used and what zone the image was in. After some research we were able to find out that the zone for this area was 17. Once this was done we were able to send it to our sponsor who had already put it to use.

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