

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. Researched 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.

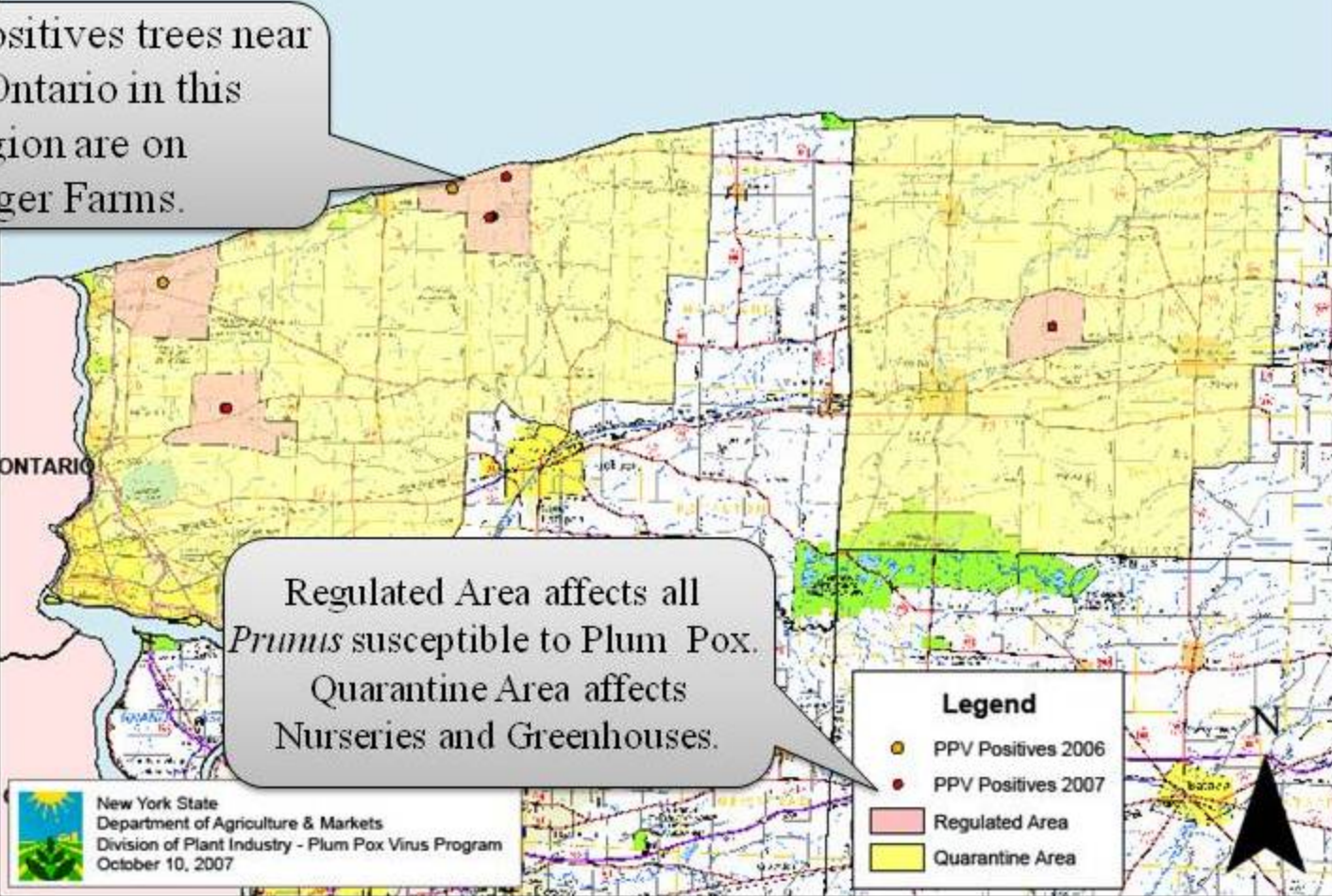
Drop down boxes allow user to input chemicals from a list of chemical. The user also inputs price of chemicals on chemical list on setup tab.

Color coded cells and text shows user where they can adjust data. Yellow cells means drop boxes. Green cells with red text mean user can adjust these numbers.

Task	units/acre	unit	\$/unit	n	total
Mowing		2 hrs	\$ 30.00	3	\$ 180.00
Brush pulling		8 hrs	\$ 10.00	1	\$ 80.00
Brush chopping		3 hrs	\$ 40.00	2	\$ 240.00
Praying		1 hrs	\$ 35.00	2	\$ 70.00
sub total					\$ 570.00
Herbicide	n	units	units used	\$/unit	total
Gramoxone Inteon	2	pt	1.5	\$ 28.00	\$ 84.00
Kocide 2000	0	gal	0	\$ 5.00	\$ -
Lorsban 50EC		lbs		\$ 5.00	\$ -
Rovral 250					
Gramoxone Inteon					
Glyphosate					
Avound					
Captain 80WP					
Assail					
Materials					\$ 84.00
total costs					\$ 654.00

Item	unit	\$/unit	Year 1		Year 2		Year 3	
			n	units used	n	units used	n	units used
Lorsban 50EC	pt	\$ 29.00	1	2.00				
Kocide 2000	lbs	\$ 4.00	2	0.25	1	0.25	1	

**Plum Pox Virus Quarantine for:
Orchard and Nursery - Greenhouse Production**



Partial Budgets includes crop planting costs, production costs, breakeven budget, gross margin, internal rate of return, monthly budget for a selected year and yearly budget for the first 10 years. The budgets for each crop data outputs are shown in cost for a single acre thus can be extrapolated to the acreage of the orchard that will be planted. First 10 years of each crop have been shown to allow the breakeven point to be shown. Most fruits take 3 years to produce their first harvestable crop and about 6 years to reach full production.

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.



Area that peaches have already been removed because of one positively tested tree.

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 has already put it to use.

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- Lawrence Theller
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