

Study of Alfalfa Green at Over the Hill Orchards

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Over the Hill Orchards

Introduction & History

Over the Hill Orchards is a Pro-Cert certified organic fruit orchard located 10 KM south east of Lumsden Saskatchewan. Fruits such as Prairie Cherries™, apples, raspberries, grapes, strawberries, pears, plums, apricots and peaches are grown in ~15 acres of land. The soil type is clay loam over clay, but varies throughout the orchard due to it's proximity to the Qu'appelle valley and pockets of heavy clay exist. Overall, the soil has a high PH level of ~7.9, but sodium levels are very low.

Soil tests were performed prior to planting in 2000 and nitrogen/phosphorus levels were shown to be adequate to begin an orchard. Bark mulch was used around each plant to reduce moisture loss and reduce competition from weeds and up until 3 years ago, the alleyways between rows were cultivated. Currently, a hay mixture of alfalfa, brome, and crested wheat grass has been planted in the alleyways to alleviate grasshopper pressure.

Poor growth began to be observed in most trees starting in 2006, but was attributed to drought conditions that occurred that year. However, in 2007 and 2008 poor growth continued even with the addition of some irrigation, so soil tests were performed at the end of 2008 and indicated very low levels of nitrogen and phosphorus.

Fertilizing through the existing irrigation system was looked at due to the ease of application, but the high costs of the fertilizer makes it economically unfeasible. While a local source manure is available and is an acceptable form of fertilizing to meet organic standards, there are many drawbacks to it's use as explained in the Alfalfa Green marketing material.

Goal of The Study

Over the Hill Orchards needs a fertilization system that is cost effective, certified organic, and easy to apply. The company has 10 grower partners located around the province which may be facing similar problems as their orchards become more mature and existing reservoirs of nutrients are used up. Prior use of the Alfalfa Green product in the orchard has shown very positive results with strawberries, but limited effectiveness with a trial with cherries. It is believed that a higher concentration of Alfalfa Green would improve growth in more established plantings, but requires more testing. If successful, Over the Hill Orchards would promote the Alfalfa Green product as a recommended product for use in an organic fruit orchard.

Study Organization

Application of Alfalfa Green was performed on ~4 acres of sour cherries which consisted of 6 cultivars totaling approximately 2100 plants. Application rates, were organized as following:

Control: No application of any fertilizer
Treatment #1: Equivalent of 1 mt/acre
Treatment #2: Equivalent of 2 mt/acre
Treatment #3: Equivalent of 3 mt/acre
Treatment #4: Equivalent of 4 mt/acre

Due to the variability of soil type throughout the orchard, the variability of cherry cultivars and ages of trees, different treatments were done within each row. There were on average 35 plants in a row, with 60 rows in total. The following application of fertilizer was performed within each row, North to South:

Control: 3 plants
Treatment #1: 8 plants
Treatment #2: 8 plants
Treatment #3: 8 plants
Treatment #4: 8 plants

Study Details

- Application of Alfalfa Green began in late April and concluded in early June.
- Each plant's fertilizer was measured and spread around the base.
- Within 24hrs of a plant being fertilized, it was watered thoroughly.
- Due to lower than normal precipitation during the growing season, irrigation was required approximately every 2nd week until mid-August.
- Due to late frosts in June, many of the younger plants' fruit were damaged so no fruit evaluations occurred.
- Measurements of shoot growth took place in July and can be found in Table 1.

Study Results

There was no definitive increase in growth shown for any of the treatments compared to the Control. Younger trees in general grew more compared to the older trees, but this has been a normal occurrence in previous years. This can be possibly explained by the relative lower amount of nutrients they require, which the existing nutrients in the soil provides.

Upon inspection of the trees in August, it appeared visually that the Alfalfa Green product did not break down completely as many of the pellets, although in an expanded state due to the intake of moisture, had kept their shape. This occurred on all treatments so it is not a case of too much product in an area. A lab analysis performed on various samples of Alfalfa Green showed much of the nutrients were still within the product and had not leached into the soil, which could explain why there was no improvement in growth. Comparatively, samples taken of Alfalfa Green around strawberry plants that performed well, were shown to have little nutrients left. The major difference between the plantings of cherries and strawberries were that the strawberries were grown in containers of soil-less media, and they needed to be watered every 2 to 3 days.

It is very likely that a fall application of Alfalfa Green would improve the breakdown of the nutrients in the product and allow entry into the soil. This will be monitored in the spring/summer of 2010 and the results will be reported.

Any wide scale use of the Alfalfa Green product needs to have an efficient applicator as applying manually by hand is very time consuming. Fertilizer spreaders on the market have varied success in spreading Alfalfa Green in a consistent fashion.

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Table 1.

ALFALFA GREEN GROWTH MEASUREMENTS																					
Date		July 22, 2009																			
*Measurements are in inches																					
Cultivar	Age	Control				Treatment 1				Treatment 2				Treatment 3				Treatment 4			
		Smp 1	Smp 2	Smp 3	AVG	Smp 1	Smp 2	Smp 3	AVG	Smp 1	Smp 2	Smp 3	AVG	Smp 1	Smp 2	Smp 3	AVG	Smp 1	Smp 2	Smp 3	AVG
CJ	2	2.0	2.1	2.2	2.10	1.9	2.2	2.0	2.03	1.8	2.2	2.2	2.07	1.9	2.3	1.8	2.00	1.9	1.7	2.0	1.87
	3	1.8	2.0	1.7	1.83	1.8	1.8	1.7	1.77	1.9	1.0	1.7	1.53	1.6	1.7	1.9	1.73	1.9	1.6	1.5	1.67
Crimson	2	1.5	1.5	1.4	1.47	1.5	1.4	1.3	1.40	1.6	1.3	1.3	1.40	1.4	1.5	1.7	1.53	1.8	1.6	1.4	1.60
	3	1.3	1.4	1.4	1.37	1.5	1.3	1.1	1.30	1.5	1.4	2.0	1.63	1.6	1.4	1.4	1.47	1.6	1.3	1.4	1.43
	4	1.1	1.3	1.4	1.27	1.1	0.9	1.1	1.03	1.2	1.3	1.0	1.17	1.3	1.4	1.1	1.27	1.0	1.4	1.0	1.13
Valentine	2	2.3	2.6	2.9	2.60	2.7	2.6	2.5	2.60	2.7	2.8	2.7	2.73	2.1	2.3	2.7	2.37	2.5	2.5	2.6	2.53
	3	2.1	2.7	2.8	2.53	2.4	2.7	2.2	2.43	2.8	2.4	2.6	2.60	2.3	2.6	2.9	2.60	2.8	2.5	2.4	2.57
	4	3.0	3.1	2.6	2.90	2.0	2.1	2.6	2.23	2.6	3.0	2.5	2.70	2.7	2.2	2.6	2.50	3.0	2.4	2.3	2.57
Cupid	2	1.5	1.8	1.7	1.67	1.7	1.4	1.5	1.53	1.6	1.6	1.6	1.60	1.7	1.4	1.9	1.67	1.6	1.5	1.5	1.53
	3	1.5	1.6	1.6	1.57	1.6	1.5	1.4	1.50	1.7	1.3	1.2	1.40	1.3	1.4	1.5	1.40	1.6	1.4	1.4	1.47
	4	1.4	1.5	1.0	1.30	1.2	1.4	1.3	1.30	1.4	1.5	1.1	1.33	1.0	1.1	1.3	1.13	1.4	1.2	1.5	1.37
Romeo	2	1.8	1.6	1.9	1.77	1.7	1.9	2.0	1.87	2.1	1.7	1.7	1.83	1.9	1.8	1.9	1.87	2.0	1.7	1.9	1.87
	3	2.0	1.5	1.4	1.63	1.9	1.5	1.4	1.60	1.4	1.3	1.7	1.47	1.9	1.7	1.2	1.60	1.4	1.3	1.4	1.37
	4	1.6	1.8	1.7	1.70	1.6	1.4	1.2	1.40	1.6	1.7	1.3	1.53	1.4	1.6	1.4	1.47	1.3	1.3	1.2	1.27