Evaluating Soil Temperature in Sweet Potato *Ipomoea batatas* Kyla Splichal, Tyler Tjelde and James Staricka

Introduction

Contrary to popular belief, the sweet potato is not even closely related to the white or Irish potato that belong to the Nightshade or *Solanaceae* family. In fact, sweet potatoes do not belong to the Nightshade family at all, but rather to the morning glory or *Convolvulaceae* family. It is a perennial vine that produces a tuberous, sweet-tasting, starchy root. It is native to tropical regions of the Americas. WREC has been testing sweet potatoes since 2010.

Objectives

This project evaluated ground coverings and their effects on soil temperatures. Sweet potatoes are a root crop that thrive in warmer climates. The hypothesis was that warmer soil temperatures early in the season would allow for an earlier planting date, longer growing season and thus, increased yields.



Methods

Black woven landscape fabric and black plastic were chosen as the treatments with bare soil as a check (Image 1). The treatments were laid out with soil sensors with two leads buried 4" below the soil surface on May 1st (Image 2). Two varieties of sweet potato, *Georgia Jet* and *Beauregard*, were chosen based off of previous years' performance. The trial was set up in a randomized complete block design with four replications and three treatments. The soil sensors were installed in two of the replications.

Results

The sweet potatoes were planted June 2nd. Slips were transplanted every twelve inches. Soil temperature data was collected from May 1st through September 14th with temperature recordings every 15 minutes. Temperature variation between the treatments was observed starting May 30th with the greatest variation occurring July 17th. Figure 1 is used to show differences in soil temperatures between the three treatments. The average of each treatment (4 sensors) is shown in the graph. Soil temperatures were lowest in bare soil, with plastic having the highest soil temperature. Yields for 2015 were lower than normal because of plant establishment early in the



Image 1



growing season. Table 1 shows the differences in yields between the three treatments. *Georgia Jet* is a dark red skinned, orange fleshed variety that produces very large roots. It is an 85 day early maturing variety making it adaptable for northern growing regions. *Beauregard* is also a high yielding 95 day variety developed by Louisiana State University. It has reddish-purple skin and bright orange flesh.

Irrigated Sweet Potato Trial					WREC-Nesson Valley 2015			
				USDA Grades				
				%				
Cultivar	Treatment	cwt/A	US #1	Petite	US #2	Commercial	Culls	
Georgia Jet	Fabric	51	16.0	20.0	10.0	20.0	34.0	
	Plastic	30	11.1	5.6	22.2	11.1	38.9	
	Bare	32	22.9	4.2	8.3	10.4	54.2	
Beauregard	Fabric	113	26.8	14.1	4.0	5.4	49.7	
	Plastic	83	13.7	22.1	6.9	3.1	54.2	
	Bare	30	20.5	18.2	0.0	13.6	47.7	
Planted: June 2nd 2015					Harvested: September 29th 2015			

Previous Crop: Wheat

Plot size: 63 ft³

Soil: Lihen Fine sandy loam; pH 7.5, O.M. 2.0%, 38 lbs N, 32 ppm P and 225 ppm K

Fertilizer: 364 lbs 46-0-0 broadcast April 10th. 152 lbs 11-52-0 applied in row at planting.

Rainfall: 8.09" from June 2nd to September 29th

Irrigation: 9.2" from June 4th to September 29th

Table 1

Conclusion

This project will be conducted again in 2016. Soil temperatures were increased with use of a soil cover and in this part of the country is helpful to extend the growing season for production which is already narrow for sweet potatoes. Evaluating soil temperatures using fabric, plastic and bare treatments in sweet potato production does show potential for increasing yields.