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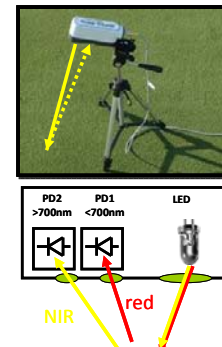
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Introduction

The peanut (*Arachis hypogaea* L.) is a very important crop for USA. It is a subterranean crop, and this fact makes it visually impossible to estimate the best digging time for crop harvesting. Various techniques are used today including visual observation of the pods, sampling and modern technology, as means to predict the best maturity time. This study aims to present a technological tool useful to farmers which can aid them in selecting the most appropriate time to harvest their crops.

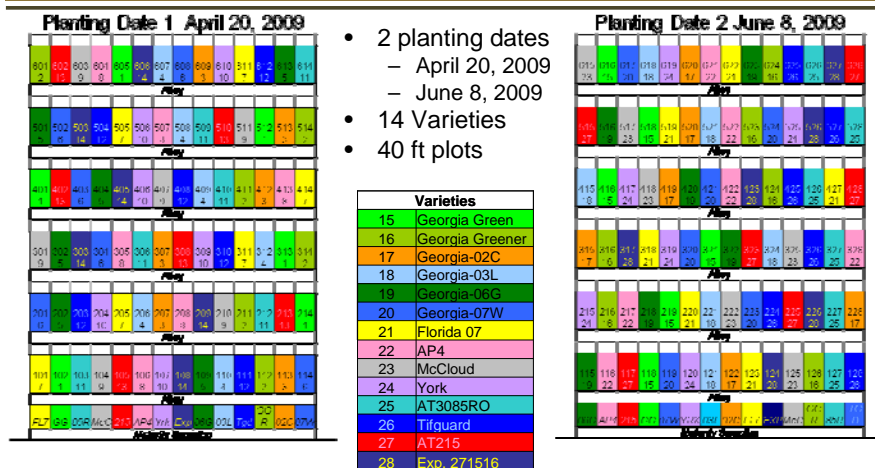
The specific objective of this study is to use the CROP CIRCLE™ sensor to estimate the best maturity time for harvesting peanuts, based on Normalized Difference Vegetation Index (NDVI) measurements, as well as potential yield for peanuts.

The Crop Circle sensor and the Peanut Profile Board used.



Materials and Methods

Experimental Design



A field experiment was conducted at Tifton, GA, USA by the University of Georgia, to evaluate 10 peanut varieties, under two planting dates. The sensor was used to record the NDVI and was regressed with visual peanut samples, using the Peanut Profile Board, taken at the same time as the sensor readings.

Results

The results of simple linear regression analysis provided good insight and the strong relationships developed (R^2 ranged from 0.45 to 0.97 and was dependent to variety and planting date) present valuable methods for farmers to use in order to save time and other costs associated with harvesting.

The equations developed can predict quite accurately the maturity stage of peanuts, or to estimate the time peanuts will be ready to harvest.

Discussion and recommendations

This study provides food for thought for many similar future projects and applications in other crop species, and the following recommendations for future project improvement can be stated .

1. The first recommendation is addressed to farmers, who cultivate peanuts, to use the provided equations, or justify them according to their peanut cultivars or to other similar studies. Farmers can benefit and it would be also wise to examine the degree to which those equations are reliable, by independently testing them in their own fields and conditions.
2. The second recommendation concerns other people conducting similar experiments. Future experiments can be improved by examining more details about the weather conditions and the environment, as well as other properties such as soil texture and moisture, fertilizer application, etc. By examining more factors in a project, there are more possibilities for these projects to be correct and highly accurate. Multiple regression equations can then be developed and evaluate more variables, to predict yield and/or maturity.
3. The third recommendation is a more general one, and suggests that since maturity and yield of peanuts can be predicted by NDVI, other crop properties (such as Nitrogen status) can be predicted as well. In addition, scientists and experiment conductors can examine if NDVI is equally well related to other crops growth and nutrient status, such as tomatoes, oranges, and other fruits and vegetables.

References

<http://hollandscientific.com/> (last access in April 2012)

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