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NATIONAL PEANUT BOARD/SOUTHEAST PEANUT  
RESEARCH INITIATIVE  
FINAL REPORT FOR WORK Terminating December 31, 2003  
DONE UNDER RESEARCH AGREEMENT  
25-21-RF332-399  
INSTITUTION: University of Georgia

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PROJECT TITLE: Improved and Inexpensive Methods for Aflatoxin  
Determination

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RES. AGR. NO.: 25-21-RF332-399 PROJECT LEADER: Dr. David Wilson

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EXPIRATION DATE: December 31, 2003  
SPRI CONTACT: Emory Murphy NPB CONTACT: Stephen  
O'Brien

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**FINAL REPORT:**  
Objectives

- 1- To develop a simple, fast and inexpensive method to screen aflatoxins in peanut and corn.

Achievements

The ongoing research on the simple method is a laboratory study using peanut and corn samples previously collected in South Georgia. Promising preliminary results have been obtained with corn and peanut survey samples. The procedures used for the research includes extraction, cleanup and quantification as follows:

The sample was ground and thoroughly mixed in order to reduce the error factors due to variability within the sample. Aflatoxins were extracted with a polar solvent (methanol-water 80:20 v/v or acetonitrile-water 80:20 v/v).

The cleanup step included the use of basic alumina, with stainless steel frits or polyethylene frits in the cleanup column. The best results so far were obtained with the acetonitrile extraction followed by a basic alumina and sodium sulfate cleanup column step.

The quantification, the last step, included fluorescence enhancement with beta cyclodextrin or bromine (aflatoxin B1 requires enhancement), and determination of the total amount of aflatoxins using a fluorometer.

The results from this work were then compared to the results obtained from HPLC and VICAM (aflatest plus fluorometer). From these preliminary results, it can be inferred that the reliability of the method tends to be best for samples with total aflatoxins above 100 ppb. Hence, the cleanup procedure still has to be improved before final results are considered.

This research is ongoing and was funded for an additional year.