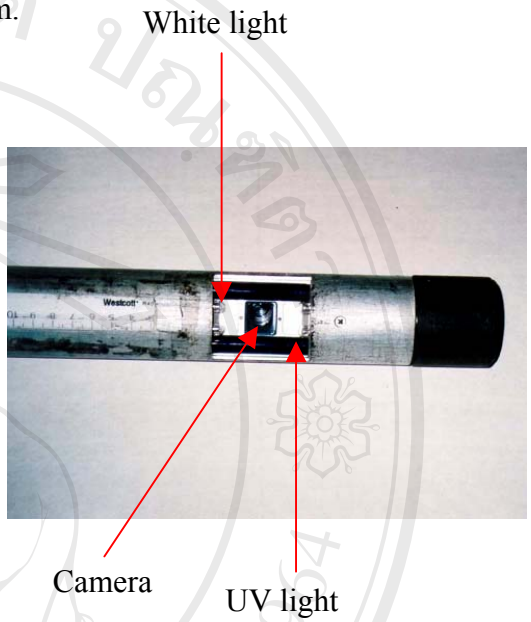
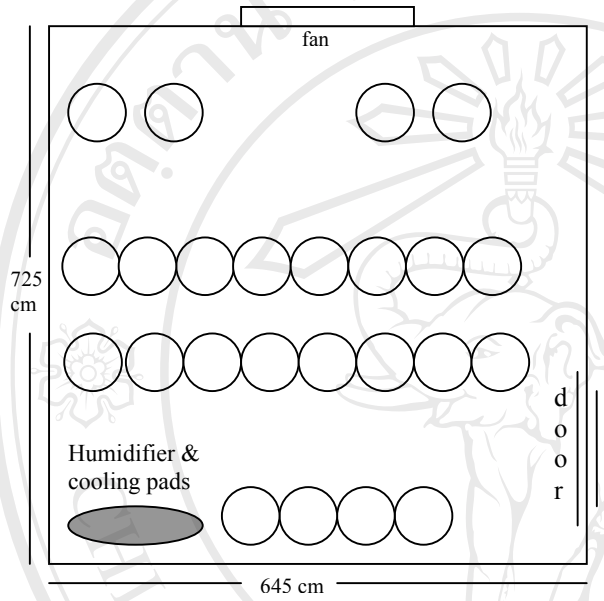
APPENDIX

Appendix A A minirhizotron camera system.



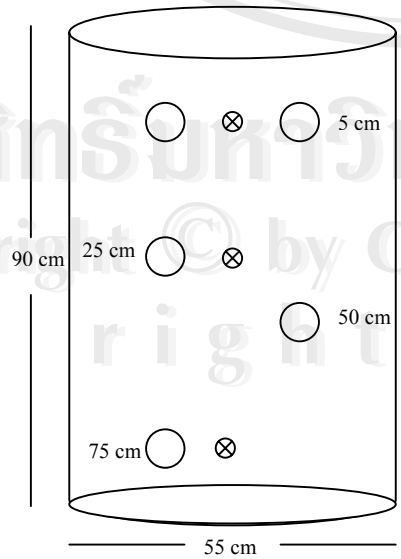
Appendix B Experiment set-up of drums and minirhizotron setup at the Georgia Envirotron Greenhouse, University of Georgia, Griffin, Georgia.

a) Layout of drums at the Envirotron Greenhouse



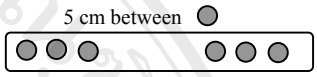
b) Position of minirhizotron tubes (and soil moisture blocks) at each drum

Minirhizotron tubes will be positioned horizontally along the diameter of the drum with center of tube at the given depth shown next to the position of each tube.



○ Minirhizotron tube ⊗ Soil moisture block and thermocouple

C) Minirhizotron tube sampling points.

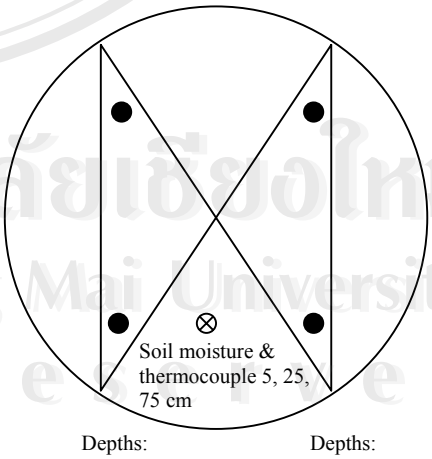


Sampling points in each minirhizotron tube will be 5 cm apart.

Inside diameter of tube = 50.8 mm
Outside diameter of tube = 57.2 mm

d) Topview of the drum.

Location of seedlings are represented by dot (•); and location of minirhizotron tubes are shown by straight lines along the diameter of drum.



Depths:
5 cm
25 cm
75 cm

Depths:
5 cm
50 cm

Appendix C Installation and operation of QuaCos (Quantification of Color System).

Installation

The QuaCos directory includes files named **Quacos.cab**, **setup.exe**, and **setup.lst**. To install, either use either Windows Explorer double click on **setup.exe** or click **Start** then **Run**. Select **Browse** to find path to **setup.exe** and then click **ok**. We recommend installing QuaCos under the program director, which is set as the default.

Operation

1. Open QuaCos, for example, by selecting **Start**, the **Programs**, and finally **QuaCos**. Please select **Disclaimer**, and then read and accept the terms of using QuaCos.
2. Select **Ok**, which will lead to the display of a window with four tabbed cards at the bottom.
3. Under the **Input Option** tab select the path where the images to be analyzed are stored.
4. Click the **Output Option** tab to select the color values to be stored and the path for storing data.

To analyze an entire image:

5. Select the **Full Image Analysis** tab.
6. Select the size of pixel groups to be averaged. Note that the smaller the size of pixel groups, the longer the analysis requires. It necessary, you may also rotate the data to match the orientation of the image.
7. To analyze a single image select the **Single** button. To analyze all images in a folder using the same setting select **the Batch** button.

To analyze a portion of an image:

8. Select the **Partial Analysis** tab.
9. Select area to be analyzed from options provided, that is, either 10×10, 25×25, 50×50, 75×75, 100×100, or 500×500 pixels. The area selected must be smaller than the image.
10. Position the selector over that portion of the image to be analyzed.
11. Select the **Analyze** button to analyze a single area. Repeat the process to analyze other areas of the image. Alternatively, select **Batch** to analyze the same area of all images in the folder.

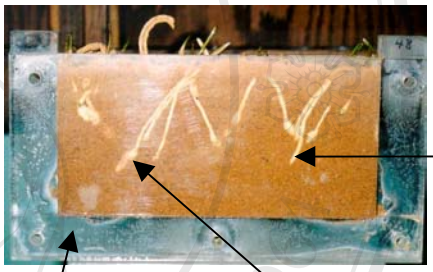
Displaying Data

Data are stored in comma delimited ASCII format. They are named as image name_color.map. To open these files with Excel (© Microsoft), first open Excel. Select **File**, **Open** and browse to locate data. Select **Delimited** then **Next**, **Comma** then **Next**, and **Finish**. To display the data, we find it convenient to create a graph using **Surface** chart type with the **Contour-color** option

Appendix D Hydroponic system under greenhouse at Lampang Agricultural Research and Training, Lampang, Thailand.

Appendix E Four peanut genotypes grown under growth chamber condition at Georgia Envirotron, University of Georgia.

Cracked corn inoculum applied on the soil

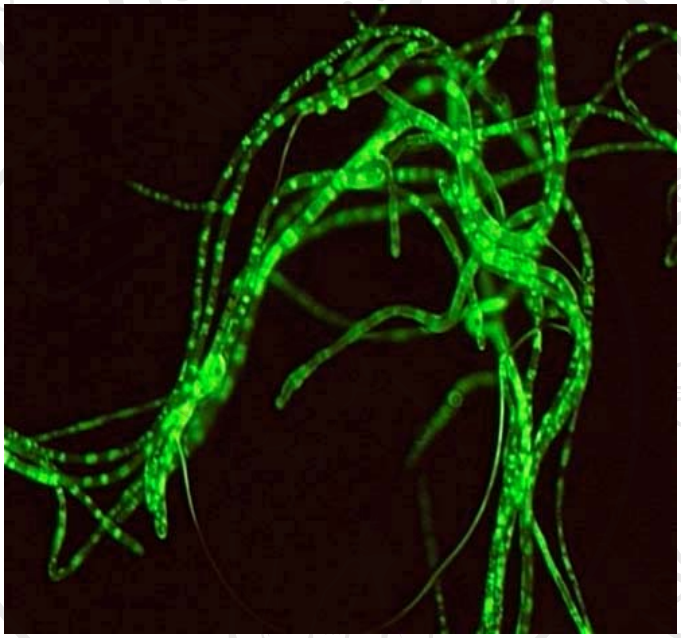


peg

pod

Soil mini-cuvette

Appendix F *Aspergillus flavus* contains a green fluorescent protein (GFP) developed by J. Carey, USDA-ARS, New Orleans and G. Payne, NCSU, Raleigh, North Carolina.



Appendix G Ovaries and pegs observed with a UV (ultra-violet) illuminating microscope and plated on M3S1B medium.

The embryo of ovary

The embryo of peg

Appendix H Wilting symptom of peanut plants in water deficit treatment.

CURRICULUM VITAE

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Birth: 19 August 1977, Lamphun, Thailand

Academic record:

Qualification	Area of concentration	Year	Institution
Ph. D. candidate	Crop production†	1999-present‡	Chiang Mai University
B. S. Second class honor	Agronomy	1999	Chiang Mai University
High school		1995	Teerakarn Banhong school, Lamphun

† Thesis title "Effect of Root and Pod Exudates on Drought and Aflatoxin Resistance of Peanut Genotypes"

‡ Examination expected February 2005.

Other training:

2001 Attended Lab work at Crop and Soil Sciences Department at University of Georgia, Griffin Campus, USA. (June 2001- May 2002).

2004 Attended lab work at Agricultural & Biological Engineering, University of Florida, USA. (October- December 2004).

Scholarships:

Royal Golden Jubilee Ph. D. Scholarship (RGJ) of The Thailand Research Fund, Thailand (1999-present)

Supporting fund from Dr. Keith T. Ingram at the University of Georgia, Griffin Campus, USA. (November 2001- May 2002)

Teaching Assistant of the Agronomy Department, Faculty of Agriculture, Chiang Mai University (2004).

Publications and papers:

Janjira Puntase, Keith Ingram, Chuckree Senthong and Corley Holbrook. 2001. Plant Traits that Confer *Aspergillus* and Drought Resistance in Peanut Varieties. 14th Annual Aflatoxin Elimination Workshop, 25-26 October 2001, Embassy suite-paradise valley, Phoenix, Arizona, USA.

Janjira Puntase, Chuckree Senthong, Keith Ingram, Arthur Weissinger and David Wilson. 2003. Maximizing *Aspergillus flavus* Infection of Peanut. A paper presented at the RGJ Congress IV, 25-27 April 2003, Jomthien Palm Beach Resort, Phattaya, Chonburi.

Janjira Puntase. 2003. Plant Traits that Confer Aspergillus and Drought Resistance in Peanut Varieties. A paper presented at the meeting of TRF Meso Groups in Crop Science, 9-11 May 2003, Agronomy Department, Faculty of Agriculture, Chiang Mai University.

Janjira Puntase, Keith Ingram and Chuckree Senthong. 2004. Aspergillus flavus Population on Root and Pod Zone of Peanut Genotypes. A paper presented at the 2004 Technical Meeting of the Senior Research Scholar's Project in

Filed Crop and the RGJ Seminar Series XXVIII: Field Crops, 6-7 May 2004. The Imperial Phukaew Hill Resort, Khaokho, Petchaboon, Thailand.

Janjira Puntase, Chuckree Senthong, Sawit Meechoui and Keith Ingram. 2004. Effect of Root Exudates on Drought and Aflatoxin Resistance of Peanut Genotypes. Copyright©2004. New directions for a diverse planet: Proceeding of the 4th International Crop Sciences Congress, 26 September – 1 October 2004, Brisbane, Australia.

J. Puntase, K. Ingram, C. Senthong and C. C. Holbrook. 2002. Plant Triats that Confer *Aspergillus* and Drought Resistance in Peanut Varieties. *Mycopathologia* 155: 94.