

December 14, 1993

**RESEARCH REPORT: PINELANDIA BIOPHYSICAL LAB.**

**LABORATORY Code: KS-02-14**

PLANT MATERIAL: Plants and seeds, *Glycine max*

**FORMATION:**

No.1- 35 ft. circle in field at Ankeny, Iowa (near Ottumwa); area practically devoid of plants - surrounded by normal green crop (see Fig.1). Formed prior to 9-22-93.

No.2 - 21 ft. circle in field at Drakesfield, Iowa (near Ottumwa); circular area of defoliated plants, surrounded by normal crop (see Fig.1). Formed prior to 10-7-93.

SAMPLES SUBMITTED BY: Professor Jack Kasher, University of Nebraska

COMMENTS ON SAMPLES: Both fields planted middle of June; No.1 field had soybeans in 1992, and No. 2 field corn.

**LABORATORY EXAMINATION:**

**1.) CELL EXAMINATION IN STEMS:**

Within the conductive or xylem complex of plants the cell wall pits in the tracheid fibers are in a filter arrangement. It should be pointed out at the onset that this pit arrangement is quite different than the smaller, random pit fields in the parenchyma tissue, as discussed in detail within previous reports.

Samp. No.1- in the control plants, the tracheid pits were ovoid in shape, whereas in the tracheids from the formation plants the pits were laterally elongated or lenticular in shape. Typical examples of these tracheid cells are shown in Fig.2, attached.

Samp. No.2 - in this sample set there was less apparent difference between the cell wall pits in the tracheid fibers; however, there was an indication of the lateral extension in the cells from circle plants.

Formation- Soybeans, Iowa

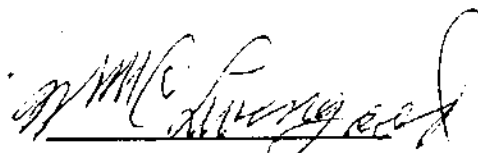
**II.) SEED GERMINATION AND SEEDLING DEVELOPMENT FACTOR DI**

In the Samp. No.1 sets no seeds were found in the circle formation plant material. Only six, very immature appearing seed pods were present and their reduced size indicated that development was terminated soon after anthesis. This situation is consistent with observations concerning seed development in other species where the formation occurred early in the crop season.

Seeds were present in the Samp. No.2 crop formation set and were found to be only 50.7% the weight of the control seeds. Paper roll germination testing disclosed a significant depression in the growth development factor within the crop formation seeds. Although the formation occurred at a later date than in the Samp. No.1 field it was still at a point in the early development stages where embryo growth was retarded.

**CONCLUSIONS:**

Although this is the first time this species has been examined in this laboratory, the results indicate that the effect of the crop formation energies on the plants was very similar to those observed in other species. When the formation occurs early in the development stages of embryogenesis the growth and seed formation is severely retarded.



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Pinelandia Biophysical Lab.

Fig.2 Changes in cell wall pits within tracheid fibers in xylem complex from crop formation in soybean field (KS-02-14) Sample group No.1 (450X)

Ovoid shaped pits in tracheid from controls.



Lenticular shaped pits from formation plants

