Study of Simulated Crop Formations, 1994

Laboratory Code: KS-02-48

Plant material: Wheat plants with seed heads, *Triticum aestivum*.

Formations: Approximately 6 ft. diameter circles of downed wheat, prepared with an iron roller device (see attached sketch), at the following stages of development.

Samp.#1-formed 5-27-94, plants returned to upright position by harvest.
Samp.#2-formed 6-4-94, plants partially upright at harvest.
Samp.#3-formed 6-10-94, plants down at harvest.
Samp.#4-formed 6-18-94, plants down at harvest.
Samp.#5-Upright Controls taken 7-13-94, at the time of harvest.

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Additional Information: Our friends and associates at Pro-Seed, prepared these sample groups for the purpose of providing a set of crop formations under controlled and reliable, known conditions. We were not aware of their existence until the harvest date, at which time photographs were taken for record purposes. This is our first opportunity to examine simulated crop formations produced in a timed sequence, throughout the growth cycle, and within the same field and variety.

Duane Bell designed a cylindrical, approximately 3 ft. long iron roller weighing around 45 lbs. (see attached sketch) which rotated around its axis. One end was attached to a stake (this became the epicenter of the formation) and the other end was pulled along the ground by means of an attached rope. Each formation received three consecutive rotations, then was left alone for the rest of the growing season. The formations were about 20 ft. apart (controls were taken about 100 ft. from the circle set).

Laboratory Results:

The results of stem node analyses are listed in the following table. The node expansions are based on the ratio comparison method; however, since the plants were freshly harvested the magnitudes of the observed differences are comparable with the recently utilized and more efficiently applied, node length parameter.

Stem Node Analyses

Sample Group	Node Expansion------- ave.	sd	N	Change	Node Bending ave.	s.d.
Samp.#1 (5-27-94)	1.136	0.070	8	+2.2%	4.25	2.66 (degrees)
Samp.#2 (6-4-94)	1.188	0.052	8	+6.8%*	13.62	6.61*
Samp.#3 (6-10-94)	1.208	0.072	8	+8.6%*	17.50	6.68*
Samp.#4 (6-18-94)	1.170	0.056	8	+5.2%*	5.87	6.77
Samp.#5 Control	1.112	0.037	8	------	3.12	1.36

*- P<0.05

Two split nodes and two cavities were found in the test samples (both present at a level of 6%). The detailed, microscopic characteristics of these alterations from the simulated circles (none were found in the control group) were, however, quite different than those found in energy induced crop formations. They were indicative of an applied bending stress, rather than expulsion cavities with pressure release from within. The overall frequency of 6% is also minimal compared with levels of 40% to 80% observed in many of the external energy produced formations.

Seed weight comparisons disclosed no apparent differences between the sample groups. The usual paper roll germination was conducted after taking the seeds out of dormancy. The seedling growth at the 8-day development stage is summarized below.

Seedling Growth Analyses:

Group	Seedling ht.-cm ave.	sd	N	Growth Change	Sig.
Samp.#1 (5-27-94)	13.25	2.13	20	+3.8%	N.S.
Samp.#2 (6-4-94)	12.55	3.27	17	-1.6%	N.S.
Samp.#3 (6-10-94)	11.84	3.70	19	-7.2%	N.S.
Samp.#4 (6-18-94)	11.48	4.46	20	-10.0%	N.S.
Samp.#5 Control	12.76	3.21	20	------	---

Comments:

From several aspects this was an extremely important series of samples, the most significant being, they provide a base line for quantitatively understanding the level of alterations one might expect from normally downed plants (both mechanically and naturally produced)

when compared with the alterations in non man made formations. The data clearly demonstrate that there are reliable, quantitative differences between the mechanically produced and the alterations occurring in crop formations originating from external energetics.

To substantiate the above comments we only need to go back and examine node expansion and growth data from very recent reports. First, with regard to the node expansion and bending data, we note in the above simulated circles that compared with the Samp.#5 controls, there are statistically significant increases in the node expansion with a maximum in the range of 8%, whereas in the crop formations we consistently find node expansion levels 30-60% higher than the control nodes (see, for example Reports No. 24, 25 & 26). We have also recently found that in some formations the node expansion levels are in agreement with an electromagnetic energy absorption model (Report No. 24).

Node bending values in the range of 40-70 angular degrees are frequently observed in the crop formation samples, again considerably higher levels than shown in the simulated circles. The above data also indicate that this limited susceptibility to mechanical node bending is most apparent during the mid-development stages.

The seed development and resulting plant growth is not affected to any significant degree by the mechanical downing process. It is important to point out here that the above table of growth data also shows that this lack of influence from mechanical damage is maintained throughout the development stages of the crop. In the crop formations we find highly significant growth suppression (and in some cases increases) in samples taken at various development stages. The growth and anatomical information obtained from this simulation study will be very useful in future studies of the crop formations.

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Fig.1

(KS-02-48)

Rough sketch of iron roller used to simulate crop circle formations in wheat (1994)