Crop Formation: Allen Co., Ohio 1996

Laboratory Code: KS-03-123
Location: Allen Co., Ohio
Material: Timothy grass (*Phleum pratense*) **Formed:** 7-24-96
Sampled: On three different dates; by Roger Sugdon, Aug. 3; Jeff Wilson and Jayson Braden, Aug. 1, and John Timmerman and Sharon Stayonovich, Aug. 13, 1996.

Formation Characteristics: See enclosed diagrams.

Relevant Findings:

1) - all three formation related sample groups disclosed significantly lengthened stem nodes.

2) - two sample sets (designated as "wind damage") from a randomly downed region in the field, disclosed node expansion levels as high as +167% relative to the mean of the controls..

3) - comparison of node expansions in the sample sets taken over the 12 day period of sampling revealed that the plants were at a stage of maturity where gravitropism was not a factor in contributing to the significant node expansions.

4) - it is important to note that in many formations the **so-called "wind damage" regions <u>are associated</u> with the geometric crop formation.** We have consistently pointed this out in past studies. "Popular wisdom" regularly refers to non-geometrically downed crops as wind damage, yet we find here, as in many other cases studied in this laboratory, that these regions can have a <u>higher degree</u> of energy related alterations (such as node expansion etc.) than is found in the nearby geometric areas.

Results and Discussion:

<u>Node Length Analyses</u>

In Fig.1 are frequency distribution analyses of the node length data taken from the Wilson-Braden sampling. The added bracket at the right of the histogram was arbitrarily chosen to designate the "anomalous region" of high node expansion. In the chart showing the formation sample data (bottom) the bars indicate a much larger concentration of plants with the anomalous node expansion than in the control chart (above). This same type of analysis was conducted on the Timmerman-Stayonovich samples. The controls are shown in Fig.2A (table of statistical data at bottom) and the formation sample analysis in Fig.2B - where again we find a large number of samples collected in the anomalous, high node expansion region.

The degree of node expansion within individual sample sets is shown in Fig.3 and Fig.4; in the Sugden sampling there were only three samples taken within the formation. Since the individual samplings were conducted over a twelve day period it became important to examine the possibility that these significant node changes might be explained by gravitropic[1] effects. If this were the case we should observe systematic changes in the downed crop samples, during this period of sampling. In Table 1 we show the mean node length levels from the controls and formation sample sets listed according to the elapsed time after the formation occurred.

Table 1.

Mean node lengths in control and formation sample sets taken on the three sampling dates.

Days- Post	Controls			Formation			
Formation	ave.	s.d.	N	ave.	s.d.	N	Node Length Change
8	1.39	0.63	45	2.04	1.00	142	+47%
10	1.70	0.52	55	2.18	0.62	50	+28%
20	1.57	0.54	91	2.21	0.45	150	+41%

Since these data show no consistent variation in the node lengths over the 12 day period it may be concluded that the plants were mature and were not effected by gravitropism.

REFERENCE

1) *Gravitropic Responses in Simulated Crop Formations*, 1997., BLT Report No. 86, 10-14-97

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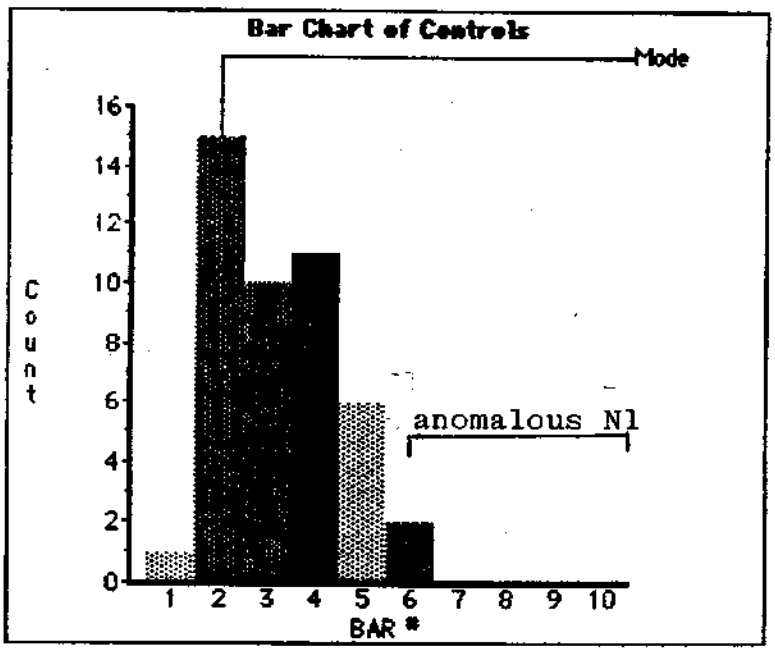
Fig.1 Frequency distribution analysis of Wilson-Braden sampling of crop formation KS-03-123-A (addendum).



Bar# = 0.5 mm Node length interval

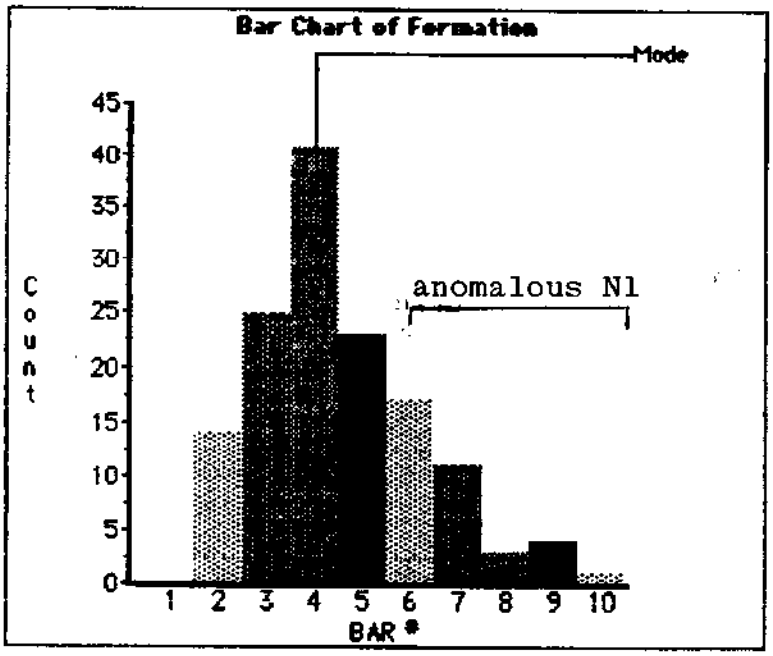
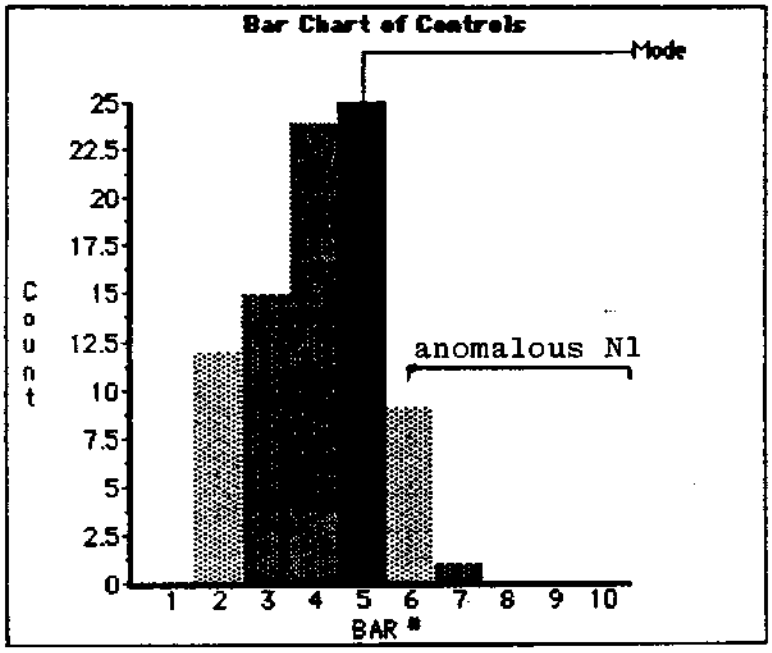


Fig.2A Frequency distribution analysis of Timmerman-Stayonovich sampling of crop formation KS-03-123-A2(addendum).

Control Analysis



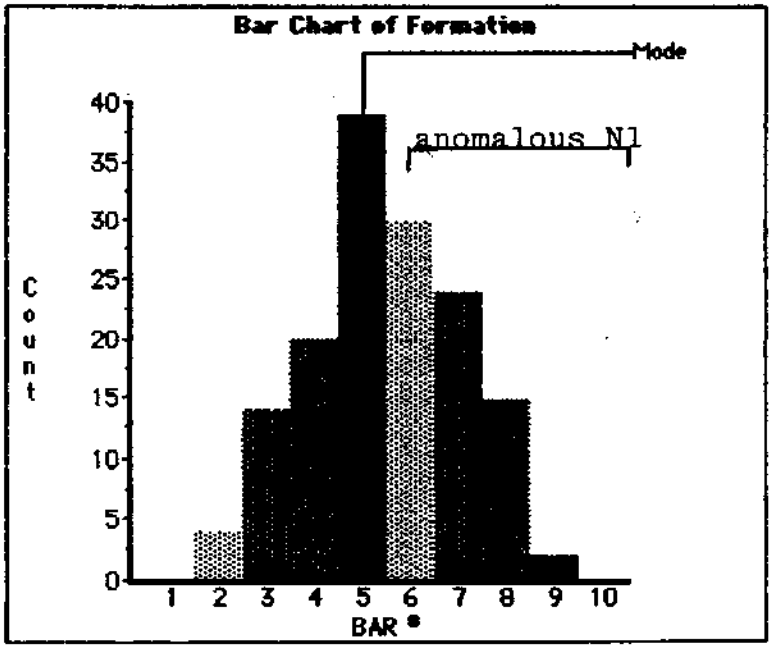
Bar# = 0.5 mm Node length interval

Controls

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1.713	.592	.064	.351	34.579	86
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	*** Missing:**
.5	3	2.5	147.3	282.11	0
Mode:	**Kurtosis:**	**Skewness:**			
1.5	-.965	-.101			

Fig.2B Addendum group KS-03-123-A2 (see Fig.2A for controls)

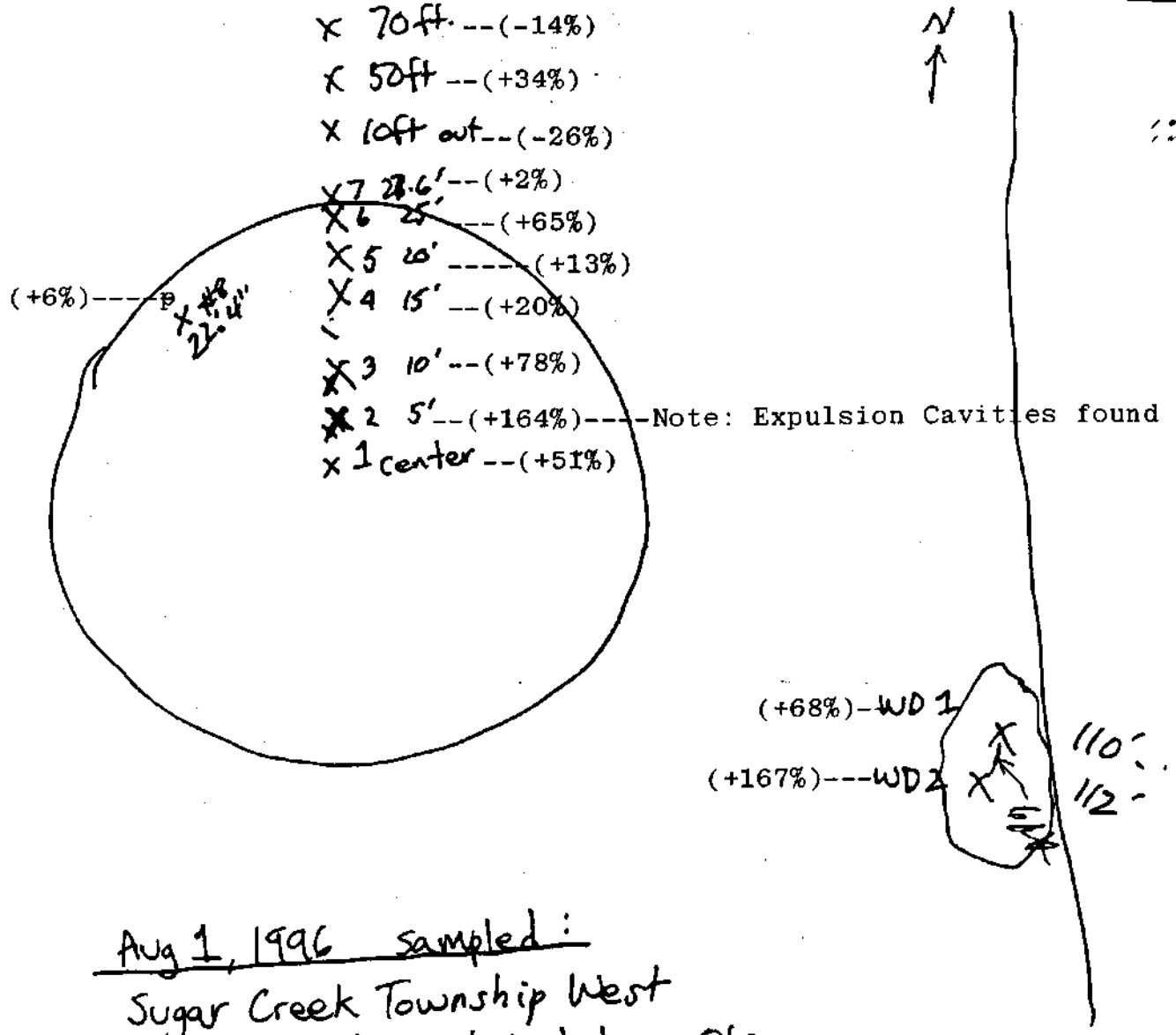
Formation Analysis



Bar# = 0.5 Node length interval

Formation

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
2.391	.78	.064	.608	32.605	148
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	*** Missing:**
.7	4.2	3.5	353.9	935.61	0
Mode:	**Kurtosis:**	**Skewness:**			
2	-.635	.045			



Aug 1, 1996 sampled:
Sugar Creek Township West
between Elida and Delphos, Ohio
corner of Billimack and Kemp
4/10ths of mile due east of circle is
a creek (Honey Run Creek)

KS-03-123-A

Fig.3 Node expansion levels in the Wilson-Braden sampling. Values are relative to mean of controls.

...ON TOWNSHIP, ...LEN COUNTY, OHIO
One mile west of Elic...on St. Rt. 309 to Kemp Road, North to field SE of Billymack Road intersection, in 3 ft. grass field measuring 225 ft. E-W and 215 N-S. Not visible from the road. Wheel and foot paths lead to and from the formation as of Aug.13 1996. Examined by John P. Timmerman and assisted by Sharon Stayonovich 4 to 7 p.m.

6 cd.
8-16-96

KS-03-123-A2
(Addendum)

NOTES

Distances are all from the Epicenter of the formation. The drawing and locations are not to scale. North is magnetic.

SAMPLES

S-1	19'	SE
S-2	10'	SE
S-3	1'	NW
S-4	9'	NW
S-5	18	NW
S-6	27'	NW
S-7	12'	ENE
S-8	11'	WSW

CONTROLS

C-1	1	SE
C-2	28	NW
C-3	52'	NW
C-4	102'	NW

EPICENTER TO PERIMETER

N...28'	NE...25'
E...22'	SE...20'
S...18'	SW...21'
W...24'	NW...27'

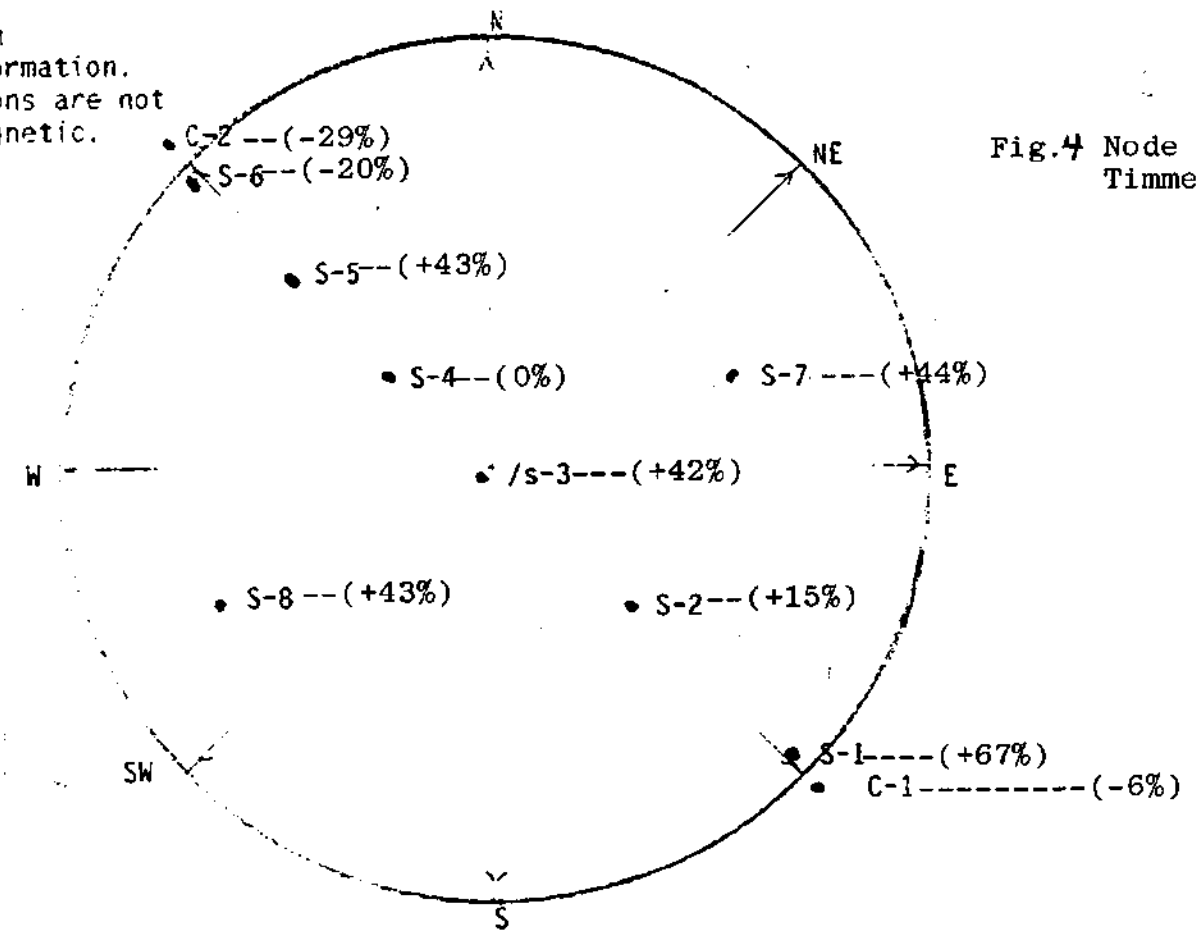


Fig.4 Node length changes in the Timmerman-Stayonovich samp.

This formation is not a true circle, due to irregularities around the perimeter. Some of this may be due to visitor damage since discovery from aircraft August 1st. North-of-field neighbor LaVonne Hartman's miniature collie dog awoke them with unusually energetic barking after midnight July 27th for unexplained reasons. No other neighbors have been questioned to-date. The ground is quite had due to no recent rain. These samples and controls were removed with an ax. A 12-pound magnet dragged in a spiral around the epicenter collected no visible debris. Scorching of vegitation as reported by others was not observed on this date. Within the formation, evidence