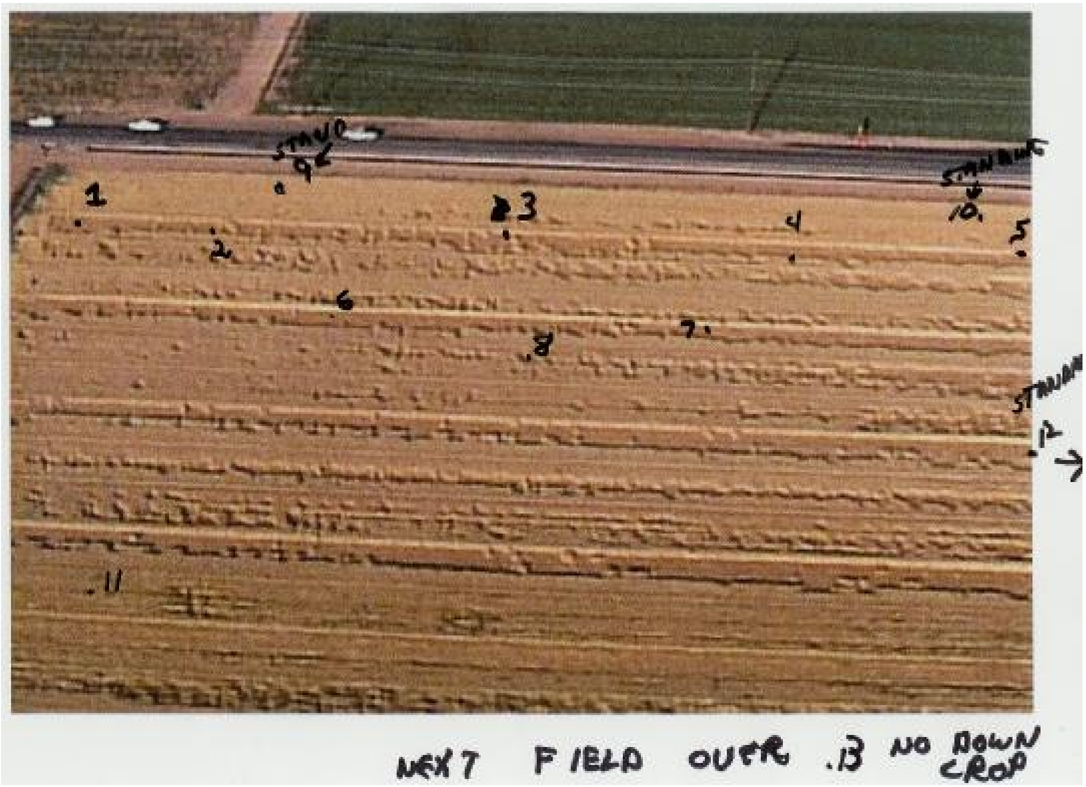
ICCRA Results of the Plant Analysis of the Tolleson, Arizona "Randomly-Downed" Formation

On June 3, 2005, I received from Rod "Bearcloud" Berry a full set of plant samples taken from the Tolleson, Arizona "Randomly-Downed" Formation [RDF] event site. His set of samples was as well-collected and prepared as I've ever come across. Here is Bearcloud's diagram of the sample site of where he collected each sample:



Photograph © 2005 by KTVK, Channel 3 News, notes by Rod "Bearcloud" Berry

Each sample stalk was labeled as to its origin, each sample set was bagged separately, and the control plants (from standing sections of crop) were kept completely separate from the flattened plants by cardboard within the shipping container.

Growth Node Measurements [L-NEAT]

Upon opening the shipping box, Delsey Knoechelman and I set about measuring each node, on each stalk, in each sample set. In clear-cut cases where there aren't additional considerations, it is not necessary to make measurements of all the nodes of each stalk - just a single node across all the sample sets has proved sufficient. In most of W.C. Levengood's node elongation analysis [L-NEAT, Levengood Node Elongation Analysis Test], he has used measurements of the apical node. In this case, we decided that we would make the additional measurements of each node to further solidify the analysis. We used an electronic digital caliper as the measuring tool (gratefully donated to us by ICCRA member Steve Moreno, Director of PSI-Applications):

With this tool we can accurately measure the growth node on each stalk to two decimal places. This level of accuracy is not necessary for performing an L-NEAT (a ruler is sufficient), but we find it gives us an accurate number, and can take out potential ambiguity in doing the measurements. In measuring each node, we started our numbering one node up from the

base of the plant, and continue to measure each node to the node before the seed head. Others have named these nodes (apical, basal, etc...) we have just numbered them from base to tip for simplicity in this case.

Here is a table of the node measurement results:

Tolleson, Arizona RDF Barley Growth Node Measurements – Collected May 30, 2005; Measured June 3, 2005

	Plant #	Node 1	Node 2	Node 3	Node 4	Additional Notes - * Note: all measurements in mm
Control	9a	2.13	2.29	2.29	2.67	
Control	9b	1.50	1.51	2.37	2.46	
Control	9c	2.19	2.34	2.43	3.11	
Control	9d	1.92	1.81	1.75	2.84	
Control	9e	2.55	2.18	2.17	2.81	
Control	10b	2.14	2.43	2.41	2.98	
Control	10b2	1.83	2.05	2.31	2.31	
Control	10c1	2.16	1.71	2.19	2.28	
Control	10c2	1.70	1.87	2.79	2.78	
Control	10d	2.04	2.36	2.35	2.84	
Control	11a1	1.88	1.97	2.29	2.41	
Control	11a2	1.72	1.35	1.82	2.05	
Control	11b	1.93	1.29	1.70	2.22	
Control	11c	1.96	1.99	2.28	2.40	
Control	11d	1.17	2.24	2.85	3.84	Broken stalk in handling?
Control	11e	2.38	2.38	2.38	2.83	
Control	11f	1.92	2.57	2.87	3.70	
Control	11g	1.37	1.72	2.49	2.79	
Control	12a1	2.80	1.88	2.66	2.77	
Control	12a2	2.54	2.26	2.45	2.78	
Control	12b	1.45	1.26	1.43	3.49	Broken stalk at 4th Node in handling?
Control	12c	2.05	2.96	2.97	3.45	Stalk broken in handling?
Control	12d	2.10	2.47	2.97	3.10	
Control	13a	1.95	2.74	3.73	3.29	
Control	13b	1.78	1.76	2.60	3.44	
Control	13c	1.65	2.09	2.90	3.00	
Control	13d	1.44	1.69	1.92	2.23	
Control	13e	1.80	1.37	1.37	2.15	
Control	13f	0.76	1.47	2.25	2.14	
Control	STDEV	0.43	0.45	0.50	0.49	
Control	AVG	1.89	2.00	2.38	2.80	
Formation	1a	4.59	4.60	4.63	5.39	Node 4 Recovery, Node 5 - 6.87
Formation	1b	5.44	5.44	5.09	5.60	Node 4 Recovery
Formation	1c	3.11	3.86	3.48	4.50	Node 4 Recovery - Node 3 Diamond Split
Formation	1d	3.28	4.84	4.43	6.04	Node 4 Recovery - Node 2 & Node 3 EC
Formation	1e	3.14	3.15	3.58	4.92	Node 4 Recovery - Node 3 EC
Formation	1f	3.22	3.49	3.43	4.84	Node 4 Recovery - Node 1 EC
Formation	2a	2.91	3.38	3.60	4.43	5th Node blown 3.39
Formation	2b1	2.74	2.74	3.32	4.99	
Formation	2b2	2.74	2.74	3.09	2.94	
Formation	2c	2.45	3.23	3.23	4.28	Broken at 3rd Node
Formation	2d1	2.94	2.43	3.52	6.64	Node 4 Recovery and mechanical cracks
Formation	2d2	2.31	2.16	2.54	3.42	Node 4 Recovery and mechanical cracks
Formation	2e1	2.67	3.04	3.64	3.66	Node 4 Recovery
Formation	2e2	2.57	2.04	2.74	5.48	Node 4 Recovery
Formation	3a1	3.38	3.26	4.26	4.18	Node 4 Recovery
Formation	3a2	3.34	3.13	2.89	4.18	Node 4 Recovery
Formation	3b	4.07	3.55	3.94	5.43	Node 4 Recovery
Formation	3c	3.14	3.29	5.84	5.85	Node 4 Recovery
Formation	3d	3.19	2.88	3.51	5.89	Node 4 Recovery - Node 3 EC
Formation	3e1	3.09	3.45	3.85	5.48	Node 4 Recovery
Formation	3e2	1.90	2.98	3.64	4.71	Node 4 Recovery
Formation	3e3	3.07	2.32	2.85	5.71	Node 4 Recovery
Formation	4a	4.37	4.10	3.22	5.91	Node 4 Recovery

	Plant #	Node 1	Node 2	Node 3	Node 4	
Formation	4b	3.28	3.75	4.83	5.12	Node 4 Recovery - Node 3 EC
Formation	4c	2.58	3.19	3.61	6.66	Node 4 Recovery
Formation	4d	2.97	3.06	3.60	5.61	Node 4 Recovery
Formation	4e	3.48	3.44	4.01	6.98	
Formation	5a	3.31	2.69	4.05	6.12	Node 4 Recovery
Formation	5b	4.10	3.18	3.43	5.42	Node 4 Recovery
Formation	5c	3.51	2.56	2.89	5.61	Node 4 Recovery
Formation	5d1	3.28	3.28	3.28	5.78	Node 4 Recovery
Formation	5d2	3.18	2.75	3.48	5.78	
Formation	6a	3.59	3.65	4.12	5.17	Node 4 Recovery - Node 2 & 3 EC - Node 4 Mech. Crack
Formation	6b	3.22	3.66	3.86	5.52	Node 4 Recovery - Node 2 EC
Formation	6c1	7.37	3.76	4.00	6.97	Node 4 Recovery - Node 3 EC
Formation	6c2	3.33	3.06	3.01	4.98	Node 4 Recovery
Formation	6d	4.99	4.42	3.97	6.26	Node 4 Recovery
Formation	6e	3.34	4.16	4.17	5.83	Node 4 Recovery - Node 3 EC
Formation	7a	3.30	2.88	2.27	4.75	Node 4 Recovery w/ Mech. Crack
Formation	7b	3.30	3.32	2.74	3.22	Node 4 Recovery
Formation	7c	3.23	2.82	2.75	3.23	Node 4 Recovery & broken
Formation	7d	3.40	3.46	3.46	2.48	Node 4 Recovery & EC
Formation	7e	3.39	2.98	3.50	3.92	Node 4 Recovery
Formation	8a	1.53	1.81	2.12	3.35	Node 4 Recovery
Formation	8b	3.47	3.47	3.02	5.61	Node 4 Recovery
Formation	8c	2.99	4.06	3.49	5.66	Node 4 Recovery
Formation	8d	3.12	3.07	3.08	3.93	Node 4 Recovery
Formation	STDEV	0.91	0.70	0.71	1.08	
Formation	AVG	3.34	3.29	3.55	5.07	

Largest Formation Nodes
Largest Control Nodes

A few observations need to be noted here. First, the formation plants had been flattened long enough that phototropism/geotropism had already occurred, and this was evident in that almost every formation plant was bent 60-90 degrees away from the horizontal at Node 4 as seen in the picture below:

This being the case, we cannot use the Node 4 measurements in our comparison as we already know the physical process – the plants' recovery back towards the sun - has produced the curvature and elongation of the growth node there. We did however include the node measurements of Node 4 here for additional comparison. It should also be noted that Control Set #12 was taken in the field directly adjacent to the field with the flattening. This field contained the same barley crop variety,

but was completely undamaged. The only separation between the two fields was a small pathway. This allowed for an unaffected control sample.

Secondly, the shaded boxes in the table above show the largest measurement obtained for that Node category. It is plain to see that the largest node measurements of the standing, control plants are substantially less than the largest node measurements of the flattened plants. While this is important to note, this does not give us level of proof that the formation nodes are elongated – we will get to that farther below. But generally we can see that the very largest node measured out of more than 100 nodes in the standing plants was 3.73mm, while even in the non-recovery nodes of the flattened plants we routinely see measurements of +4mm-+7mm.

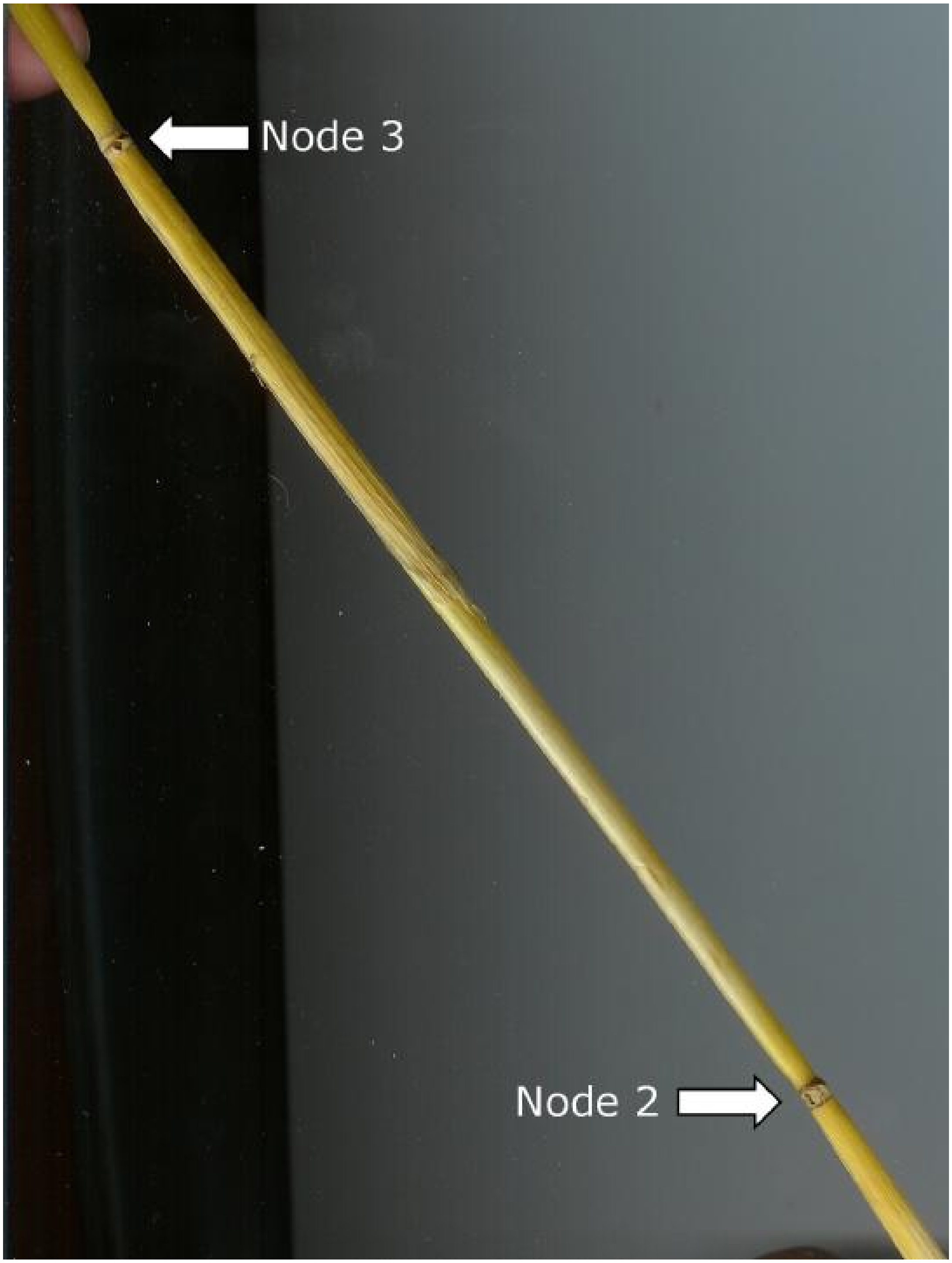
Third, the "EC" note above refers to "expulsion cavity". Every sample set analyzed from the flattened plants had at least one stalk with an expulsion cavity, or as it is more commonly known, a "blown node". No expulsion cavities were found in any of the "controls" (standing plants). Here are a few examples:

Formation Stalk 1a Node 3 **Formation Stalk 6c Node 3** **Formation Stalk 6a Node 3**

There were also examples of several diamond-shaped holes which occurred extending from the node:

Formation Stalk 1c Node 3
We feel this 'vertical split' type of damage is subtly different from a typical expulsion-produced cavity and needs further investigation.

We have noticed also in the table above that nearly all the expulsion cavities occurred in the plant's Node 3. One exception, seen in the photo below, of Formation Stalk 6a, you can see that both Nodes 2 and 3 have expulsion cavities. Node 3's expulsion cavity has occurred about a quarter-turn around the plant from the location of Node 2's expulsion cavity:



Formation Stalk 6a Nodes 2 & 3

Student's T-test Statistical Comparison

To finalize the node elongation measurement [L-NEAT] results, we took the raw measurements of each growth node, and performed a statistical analysis commonly known as a Student's *t*-test. This statistical comparison, simply, compares the actual difference between two population sets to the variation in the data (expressed as the standard deviation of the difference between both population sets). If the *calculated t* value *exceeds* the tabulated value then the populations are *significantly different.* [Thanks to Jim Deacon at the Biology Teaching Organisation of Edinburgh University for providing a clear definition on his website http://helios.bto.ed.ac.uk/bto/statistics/tress4a.html of how the Student's *t*-test is applied to the Biology field, which we've applied here.]

This figure tells us the probability of our two population sets being different. For example, if our calculated *t* value exceeds the tabulated value for p = 0.05, then there is a 95% chance that the two populations are significantly different (or 99% for p = 0.01, 99.9% for p = 0.001). A difference between the two populations at the 95% level is "significant", a difference at 99% level is "highly significant" and a difference at 99.9% level is "very highly significant". A significant result at the 95% probability level tells us that our data are good enough to support a conclusion with 95% confidence (but there is a 1 in 20 chance of being wrong). In biology, it is accepted that this level of significance is reasonable to support a conclusion.

We took our node measurements to the website Vassar Stats (http://faculty.vassar.edu/lowry/vshome.html) which has a free, online statistical calculator designed to run many statistical computations and is hosted and operated by Richard Lowry and Vassar College in New York. We compared the measurements of Node 1 of the standing, control plants to the measurements of Node 1 of the flattened, formation plants. We then did the same for Node 2 and so on. This kept the node comparisons as "apples to apples" rather than trying to compare, say a measurement of Node 1 on one plant to a measurement of Node 3 on another. Here are the results node by node (Column Xa are formation plants, Column Xb are control plants in every comparison; we included the Node 4 measurements for completeness) :

Arizona Node Test - First Nodes

VassarStats Printable Report
t-Test for Independent Samples
Sat Jun 4 16:42:25 EDT 2005

Values entered:

count	X_a	X_b
1	2.91	1.95
2	2.74	1.78
3	2.45	1.65
4	2.74	1.44
5	2.94	1.80
6	2.31	0.76
7	2.67	2.80
8	2.57	1.45
9	4.59	2.05
10	5.44	2.54
11	3.11	2.10
12	3.22	1.88
13	3.14	1.93
14	3.28	1.96
15	3.38	1.17
16	3.34	2.38
17	4.07	1.92
18	3.14	1.37
19	3.19	1.72
20	3.09	2.06
21	1.90	2.14
22	3.07	2.16
23	4.37	2.04
24	3.28	1.70
25	2.58	1.83
26	2.97	2.13
27	3.48	1.50
28	3.31	2.19
29	4.10	1.92
30	3.51	2.55
31	3.28	
32	3.18	
33	3.59	
34	3.22	
35	7.37	
36	3.33	
37	4.99	
38	3.34	
39	3.30	
40	3.30	
41	3.23	
42	3.40	
43	3.39	
44	1.53	
45	3.47	

46	2.99	

Summary Values

Values	X_a	X_b
n	46	30
sum	153.8	56.86999999999999
mean	3.3435	1.8957
sumsq	551.988	112.9083
SS	37.761	5.1017
variance	0.8391	0.1759
st. dev.	0.916	0.4194

Variances and standard deviations are calculated with denominator = n-1.

$Mean_A - Mean_B$	t	df
1.4478	+8.1063	74

P		
	one-tailed	<.0001
	two-tailed	<.0001

Arizona Node Test - 2nd Nodes

VassarStats Printable Report
t-Test for Independent Samples

Sat Jun 4 16:46:36 EDT 2005

Values entered:

count	X_a	X_b
1	3.38	2.74
2	2.74	1.76
3	3.23	2.09
4	2.74	1.69
5	2.43	1.37
6	2.16	1.47
7	3.04	1.88
8	2.04	1.26
9	4.60	2.96
10	5.44	2.26
11	3.86	2.47
12	3.49	1.97
13	3.15	1.29
14	4.84	1.99
15	3.26	2.24
16	3.13	2.38
17	3.55	2.57
18	3.29	1.72
19	2.88	1.35
20	3.45	1.98
21	2.98	2.43
22	2.32	1.71
23	4.10	2.36
24	3.75	1.87
25	3.19	2.05
26	3.06	2.29
27	3.44	1.51
28	2.69	2.34

29	3.18	1.81
30	2.56	2.18
31	3.28	
32	2.75	
33	3.65	
34	3.66	
35	3.76	
36	3.06	
37	4.42	
38	4.16	
39	2.88	
40	3.32	
41	2.82	
42	3.46	
43	2.98	
44	1.81	
45	3.47	
46	4.06	

Summary Values

Values	X_a	X_b
n	46	30
sum	151.51	59.989999999999974
mean	3.2937	1.9997
sumsq	521.7903	125.5789
SS	22.7625	5.6189
variance	0.5058	0.1938
st. dev.	0.7112	0.4402

Variances and standard deviations are calculated with denominator = n-1.

$Mean_A - Mean_B$	t	df
1.294	+8.9038	74

P		
P	one-tailed	<.0001
	two-tailed	<.0001

Arizona Node Test - 3rd Nodes

VassarStats Printable Report
t-Test for Independent Samples
Sat Jun 4 16:48:22 EDT 2005

Values entered:

count	X_a	X_b
1	3.60	3.73
2	3.32	2.60
3	3.23	2.90
4	3.09	1.92
5	3.52	1.37
6	2.54	2.25
7	3.64	2.66
8	2.74	1.43
9	4.63	2.97
10	5.09	2.45
11	3.48	2.97
12	3.43	2.29

13	3.58	1.70
14	4.43	2.28
15	4.26	2.85
16	2.89	2.38
17	3.94	2.87
18	5.84	2.49
19	3.51	1.82
20	3.85	1.97
21	3.64	2.41
22	2.85	2.19
23	3.22	2.35
24	4.83	2.79
25	3.61	2.31
26	3.60	2.29
27	4.01	2.37
28	4.05	2.43
29	3.43	1.75
30	2.89	2.17
31	3.28	
32	3.48	
33	4.12	
34	3.86	
35	4.00	
36	3.01	
37	3.97	
38	4.17	
39	2.27	
40	2.74	
41	2.75	
42	3.46	
43	3.50	
44	2.12	
45	3.02	
46	3.49	

Summary Values

Values	X_a	X_b
n	46	30
sum	163.98000000000002	70.96000000000001
mean	3.5648	2.3653
sumsq	607.349	175.0074
SS	22.7959	7.1633
variance	0.5066	0.247
st. dev.	0.7117	0.497

Variances and standard deviations are calculated with denominator = n-1.

$Mean_A$ - $Mean_B$	t	df
1.1994	+8.0328	74

P		
P	one-tailed	<.0001
	two-tailed	<.0001

Arizona Node Test - 4th Nodes

VassarStats Printable Report
t-Test for Independent Samples
Sat Jun 4 16:50:27 EDT 2005

Values entered:

count	X_a	X_b
1	4.43	3.29
2	4.99	3.44
3	4.28	3.00
4	2.94	2.23
5	6.64	2.15
6	3.42	2.14
7	3.66	2.77
8	5.48	3.49
9	5.39	3.45
10	5.60	2.78
11	4.50	3.10
12	4.84	2.41
13	4.92	2.22
14	6.04	2.40
15	4.18	3.84
16	4.18	2.83
17	5.43	3.70
18	5.85	2.79
19	5.89	2.05
20	5.48	1.97
21	4.71	2.98
22	5.71	2.28
23	5.91	2.84
24	5.12	2.78
25	6.66	2.31
26	5.61	2.67
27	6.98	2.46
28	6.12	3.11
29	5.42	2.84
30	5.61	2.81
31	5.78	
32	5.78	
33	5.17	
34	5.52	
35	6.97	
36	4.98	
37	6.26	
38	5.83	
39	4.75	
40	3.22	
41	3.23	
42	2.48	
43	3.92	
44	3.35	
45	5.61	
46	5.66	

Summary Values

Values	X_a	X_b
n	46	30
sum	234.49999999999997	83.13
mean	5.0978	2.771
sumsq	1247.8158	237.7583
SS	52.3756	7.4051
variance	1.1639	0.2553
st. dev.	1.0788	0.5053

Variances and standard deviations are calculated with denominator = n-1.

$Mean_A$ - $Mean_B$	t	df
2.3268	+11.0314	74

P	one-tailed	<.0001
	two-tailed	<.0001

Results of the Student's T-Test

In each test, the results were the same: the 'one-tailed' and 'two-tailed' results for P were all <.0001 – which, if you remember from our example above, means a result of "very highly significant". It didn't matter which set of nodes (1-3) we compared in this case – all were statistically elongated compared to the controls at greater than 99.9% accuracy, and we only included the results from Node 4 (the nodes in recovery) as an additional comparison.

In simple terms, we have statistically shown that the nodes measured from the flattened plants collected from the randomly-downed formation in Tolleson, Arizona were elongated as compared to the nodes measured from the control plants taken from the standing barley in the same field. We also pointed out examples of 'expulsion cavities' that were found only in the flattened plants – none from any of the standing controls. These characteristics (elongated nodes, expulsion cavities) are consistent with findings and node measurements done of plants in simple, single crop circles, complex geometric formations, and other 'randomly-downed' formations as noted by W.C. Levengood, Dr. Eltjo Hasselhoff, and others who have used the L-NEAT method of measuring node elongation.

As we were in the process of finishing this paper, W.C. Levengood informed us that he had also received a set of samples of the Tolleson, Arizona event collected independently by Kathy Doore and Stephanie Phelps (you can read their detailed description of the formation and their collection process here: http://www.labyrinthina.com/phoenixcropformation.htm). Levengood's node elongation measurements have also proved to be positive for node elongation, and he too has found expulsion cavities in his samples. We look forward to seeing the final results.

Impact, Conclusions, Discussion

W.C. Levengood as far back as the 1995 Blue Ball, Maryland 'randomly-downed' event (Research Report #51 http://www.cropcirclenews.com/modules/mysections/singlefile.php?lid=124) showed that these 'randomly-downed' patches of flattened crops are not always directly attributable to weather-related damage (e.g. wind, rain, etc…) or even animal lodging, but that the finding of elongated nodes and expulsion cavities in these 'randomly-downed' events must be attributable to the same physical process that is responsible for creating crop circles. Now, in the Tolleson, Arizona event, we already have on record that Trent Johnson, foreman of Brooks Farms who leases and farms this field, confirmed that the barley in this field was not flattened until after a sustained windstorm with severe winds gusting up to 40 m.p.h. occurred in the area in late April and after the field had been flooded for irrigation (see Linda Howe's interview with Trent Johnson at http://www.earthfiles.com/news/news.cfm?ID=916&category=Environment). He also indicates that the flattening was confined to the area only between the tramlines as a result of the previous season's planting of cotton, some of which is still growing in-between the tramlines strengthening that section of crop – protecting it from the damage received elsewhere in the field. Mr. Johnson also believes that their farming practice of repeatedly flooding the field also contributed to weakening of the plants before the strong winds arrived. He says this type of flattening has happened to their fields in the same fashion for many years.

How do we square these seemingly incongruent claims? If the Tolleson event is just the result of wind damage, how can we explain the results of the L-NEAT and the finding of expulsion cavities? We have the data showing conclusively that the flattened plants are statistically elongated with a 'very highly significant', more than 99.9% probability. The [L-NEAT] method of measuring node elongation is the only peer-reviewed, scientifically published test (*PHYSIOLOGIA PLANTARIUM* 92: *356-363.1994 © Physiologia Plantarum 1994* http://www.bltresearch.com/anatomical.html) to determine authentic characteristics of a crop circle. Can it be that simple physical/mechanical 'wind damage' can be responsible for elongated nodes and expulsion cavities – or can they both be right?

Mr. Johnson states that he believes there was an influence of a previous crop in the field, cotton, which could have contributed to the barley's ability to withstand damage from the wind. In places where 'volunteer' cotton plants arise, this affects the thickness of the barley and reduces its ability to resist the wind. The thinner the crop, the more likely it will be to go down. Rod 'Bearcloud' Berry visually confirmed that the field which had the flattening was substantially different from the adjacent field which also had the same crop growing in it (but was completely unaffected by any flattening):

> **When I went to the end of the field to collect a sample there was another field that sit right up against it. No fence of edge separating them. It was the same kind of field. But there was a huge difference. At first I thought it was an entirely different crop. When I looked closer they were the same. However I realized that the next field was extremely full. In the field with the anomaly I could see the stems of the crop a long distance out into to the field.. In the second field with no wind damage the stems disappeared because of the thickness of the heads only inch inside the field. The rest of the field almost appeared like a cloud or marshmallow surface. A very gently indefinable roll to the crop. No edges anywhere to be seen. Nothing visible but the long fibers that come out the heads. I**

realized that the anomaly field was very under nourished and of a very poor or even ill quality. The fruit it produced was very thin and weak appearing as the stem were. This was across the entire field. Would not have realized it if I had not have had this other field to compare it to. The second field stems must have been three times as thick and the weight of the fruit or barley head must have been about three times as massive as well. The thin stems of the anomaly field where not strong enough to with-stand the wind. The roots where about a third as strong and thick as well.

Perhaps the key to understanding this event does lie with the particular farming practice used by Mr. Johnson. In the Winter Solstice 1998 Edition of *Mid-Atlantic Geomancy*, authors Glenn Broughton and Steve Page revealed the results of a study in which they showed a very high percentage of crop circle formations reported in England from 1993-1998 occurred over chalk and greensand (71%-79%) and that the figure rose to 87%-93% when they included all formations correlated to aquifer locations (http://www.geomancy.org/ezines/ezine_12/glenn.html). They suggested that the water in those chalk and greensand aquifers were responsible for generating a unique electric field current and, as a result of this, contributed to where crop circles were being located. They weren't being found anywhere or everywhere, but overwhelmingly in locations that had this specific condition. The unique electric current is being generated, in part, by the action of moving water through the chalk and greensand – as it does so, it strips ions away from the surrounding soil and generates an electric charge. It has been our experience here in the USA, that this characteristic also occurs regularly with the majority of reported USA crop circles being located over the tops of limestone aquifers, or being located very closely to some body of water (creek, pond, drainage ditch, underground water source, etc…). This was also the case at the Tolleson site which was located next to an irrigation ditch which you can see in this photo:

Photograph © 2005 by Kathy Doore

How does this relate to Mr. Johnson's farming practice? Well, there is no chalk or greensand aquifer underneath the Tolleson site, the ground is mostly a sandy (silicon) loam into which the water quickly soaks or evaporates (Arizona being a climatological desert). By Mr. Johnson repeatedly flooding his field every 10 days or so for the duration of his growing season, perhaps it is possible that he is artificially recreating the same conditions that occur naturally in southern England? The water sinks in, stripping ions away, leaving salts behind, over and over, building up a negative charge in a fashion similar to the natural action observed in the southern English aquifers during the summertime.

Again, let us look at Mr. Johnson's farming practice. To help control the flooding process in the field, rows of mounded soil berms 2 feet high and 3-4 feet wide have been established in the field to help direct the water down evenly spaced rows. The crops in the field are planted throughout – both on the soil berms, as well as the lower 'floodplain' or channel. This sets up an interesting scenario. The negative charge is being artificially created only in the 'floodplain' areas of the field, and not on the rows of berms. Let us look at the result:


Photograph © 2005 by Scott Davis


Photograph © 2005 by KTVK, Channel 3 News

The Tolleson crops were flattened only in the 'floodplain' areas, in the same North-South orientation as the berms -- and none of the crop located on the rows of berms (where the tramlines are located) was affected.

Perhaps the strong winds in this case served to just generate a strong static electrical charge in the plants, with the plants acting as a capacitor in storing the electricity, and creating a unique charge imbalance in the field between the plants and the artificially negatively-charged soil. Since we don't yet understand the exact nature of the energy which interacts with plants to create crop circles, it might be possible in this case that the wind and flood-induced electrical charge imbalance has generated or attracted enough electrical plasma energy to cause the elongated nodes and expulsion cavities in this field in much the same way that geometric-type crop circles get their unique plant damage elsewhere. Since only this charge imbalance would exist in the 'floodplain' areas, induced artificially, only the plants in these areas would be affected – which is exactly what we see. Mr. Johnson would be right in saying that wind was responsible, but perhaps not in the way that is generally understood (e.g. the rushing air physically/mechanically pushing over the stalks). Mr. Johnson did remark in his interview that: "…we go through this every year. It's just a timing thing. We have to fight the weather and wind every year because we *don't want* the crop to go down. Sometimes we have to hold off on the irrigation for an extra two to three days in order to make the plants not go down because you don't want to be running water when there is 30 to 40 mph wind. That will lay the *whole field* down if that's the case."

Ordinary 'wind damage' isn't responsible for creating expulsion cavities and elongated nodes. And in the Tolleson event that is exactly what we have found, which leaves us with several possibilities as to how this type of damage was created. The first is the possibility that, under certain conditions, authentic energy effects might be generated by natural wind phenomena. The

second is that energy from an unseen source might generate an atmospheric phenomenon perceived as wind as a by-product of its formative action. The third, (pair), is the possibility that an unseen source operates under the concealment of natural phenomena such as wind, or that it may actually direct a natural phenomenon to produce "unnatural" results.

The Mayville/Kekoskee, Wisconsin Formation of July 4th, 2003 has proved to be a pivotal case in which a complex, geometric formation that subsequently passed all scientific tests had been witnessed forming in daylight by Art Rantala during the presence of a violent weather front.

Photograph © 2005 by Roger Sugden

The node-collar measurements from this formation proved to be positive for elongation, scores of horizontally-ruptured blown nodes were widely distributed, and other tests such as the volume of magnetic material in the formation samples versus controls were also statistically significant. However, just as important was the appearance in the same field of scattered, 'randomly-downed' patches which also proved to demonstrate the same positive energy signatures. This allowed us to initialize a line of proposed testing that was independently reinforced in Dr. Eljo Haselhoff's book ***The Deepening Complexity of Crop Circles: Scientific Research and Urban Legends(2002)***. In his book, Haselhoff hypothesizes that the inclusion of authentic node [collar] phenomena in geometric formations might be explained in some cases by the embellishment of authentic, simple formations by hoaxed additions.

In an additional case we have still-in-preparation from New Park, Pennsylvania in June of 2004, ICCRA member Dr. Charles Lietzau similarly encountered the situation in which a commercially-planned, man-made formation was laid down over pre-existing, widely scattered, 'randomly-downed' formations:

Photograph © 2005 by Dr. Charles Lietzau

A series of 13 circles and rings were created for a new 'crop circle theme park' opening in south-central Pennsylvania near New Park. Just days before the creation of the planned hoax, a weather front was associated with creating a series of 'randomly-downed' patches in the wheat. ICCRA member Dr. Chuck Lietzau was on hand to collect samples of the hoax for analysis, and found expulsion cavities and elongated nodes in the RDF patches in the field both inside and outside the hoax areas.

The New Park, Pennsylvania case of 2004 has forced us to confront this reality: the possibility of the possible presence of authentic characteristics in man-made formations, either prior to, or perhaps from an event subsequent to their creation. It appears that this could very well happen by intention or even without the awareness of those producing the mechanical formations. We believe the incidence for this type of scenario is historically low, and will continue to be low in the future. As ICCRA member Gene Thomas remarked:

> **I believe that such a situation would present quite a challenge to any hoaxer. Anybody want to try to untangle the barley in the downed crop so they can re-lay it in a hoaxed pattern? Perhaps we can discuss what might now be a key factor in a hoaxer's selection of a field in which to work: the existence of a natural formation that could be entirely included in the hoaxed pattern. The hoaxer's options are to: embellish an existing pattern (perhaps with 'keys' or 'pathways' or extending a circle's diameter or adding a 'new' circle or shape or something along those lines) or to rework a downed area into a new pattern. It seems we just need a set of diagnostic keys that would alert us to either of the two preceding possibilities (and any others you might think of). I think that sufficient sampling can help us get past the 'embellishment' hoaxer's work and observing the degree of mechanical damage to the plants and soil might help us get past the 'rearranger's' work.**

In these cases, a procedure very similar to Dr. Hasselhoff's main surveying techniques should prove to be able to make the distinction. The overall distribution pattern of the RDF's in the control areas can be extrapolated into the geometrically patterned area. It is anticipated, that in those few cases where this 'hoaxing/rearraging' scenario appears to be of concern, a very thorough graphing and analysis of the distribution of patches of energy-positive plants within the formation as compared to the area and distribution with patches in the control area should be capable of discerning the role of energy versus mechanical effects in the production of the formation. If these procedures are adopted, it should serve to deter any future attempts of hoaxers attempting to have their work 'validated' by the finding of expulsion cavities or elongated nodes in their creations. In the case of the Mayville/Kekoskee formation, literally hundreds of horizontal expulsion cavities were uniformly distributed throughout the formation indicating that the energy effects matched the design of the formation itself. Since this formation was also witnessed as it formed, this provided the "Rosetta Stone" necessary to verify the specific role of the distribution of energy effects with regards to the overall design of the formation.

The Tolleson, Arizona RDF has provided us with the opportunity to gain further insight into the authentic phenomenon. This is a welcome step in the refinement of the quality of the scientific data. It is anticipated that it will not conflict with the several generalizations which have served us so well to reach this point. Rather, it will allow us to more precisely integrate the role of each, leading to a new level of understanding of this complex phenomenon. One thing is for certain, we must continue to study such randomly-downed formation [RDF] events as time and resources allow, because they seem to hold many clues and can teach us much about the physical process of how the geometric-type crop circles – and their unique damage – occurs.

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Independent Crop Circle Researchers Association (International) [ICCRA]

The Independent Crop Circle Researchers Association (International) [ICCRA] began as a small cooperative group of individuals in the Midwestern United States who have long pursued serious research into the crop circle phenomenon with the principle of open collaboration. This 'team' of researchers has steadily grown in number, and has now included contributions from members of the crop circle research community from around the world. Although all the researchers in this association are considered independent (and thereby retaining individual ownership of their work), the investigative community has recognized that the study of the various complexities and aspects of the crop circle phenomenon are beyond the abilities and resources of any one researcher or local group to study in sufficient depth. Hence, the need for a cooperative association and network dedicated to the widest and freest possible collection and dissemination of crop circle research.

The ICCRA recognizes the need in the research community to collect and make available as much objectively verifiable knowledge and details about crop circles as possible, and so will continue to study and document crop formations using a scientific framework.

The ICCRA is committed to working cooperatively with local farmers, respecting their property and conditions for granting permission and access to their fields, and can provide experienced consultation as to the ways they can cope with the existence of having a crop circle in their field. We are also committed to working cooperatively with law enforcement agencies to assist them in assessing and investigating reported crop circles, exposing the vandalism of crop circle hoaxers, and assisting with advice on the management of visitors to the crop circle sites.

The ICCRA began as a 'core' group of individuals cooperating as a rapid response team reacting to reports of local crop circles in order to study and document them. The ICCRA has recognized the need to expand the response network to include as many interested researchers as possible. To facilitate this network, the ICCRA has begun a researcher directory so that when a crop circle is reported, the closest local investigators will be notified. This will provide the best opportunity to investigate and document the site, and also gives the wider, international community a contact-resource for information and interaction in real time.

The ICCRA's highest priority is the sharing of information and research with the wider research community. Reporting and sharing of news and field reports of formations is being carried out through www.cropcirclenews.com. To help standardize report information, researcher access to a worldwide crop circle database with professional-level GIS mapping capability is also being developed at this website which will not only document and share the information collected in a systematic manner, but will also provide new research opportunities. This research center will also serve as a depository of information collected on historical sites, scientific reports, photos, previous field reports, the researcher directory, and links to further crop circle resources. Many independent researchers have amassed valuable files over the years regarding this phenomenon. We encourage all such researchers to use this opportunity to enrich the wider community with your archived knowledge, while at the same time retaining ownership and credit for your years of effort. Through the partnership of CropCircleNews, of which a moderate ownership stake has been made available to the ICCRA, limited funds may possibly be made available for primary data collection and documentation of crop circle sites (fieldwork), and subsequent lab work.

All interested researchers, and both new and previously established organizations and networks are invited to join this cooperative and collaborative effort to locate, study, document, and share information about crop circle formations, regardless of each individual's personal hypothesis regarding the source cause of the authentic crop circle phenomenon, or their affiliations with any organizations.

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