Aug 28, 1998
Vanderhoof Canada

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LAB. REPORT #108

VANDERHOOF, CANADA - AUGUST, 1998

Top: aerial view of 3 circle formations in oat-field; arrow indicates the end of single Vanderhoof Airport runway. Bottom: I set of formation circles (both photos: Chad Deetken).

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October, 1999
Pinelandia Biophysical Lab

Crop Formation: Vanderhoof, Canada 1998

Laboratory Code: KS-04-138
Event Location: Vanderhoof, British Columbia, Canada
Date Occurred: August 27, 1998
Date Discovered: August 28, 1998
Date Sampled: September 2-3, 1998
Materials Sampled: Oat plants (*Avena sativa*) and soils
Sampled By: Chad Deetken, Vancouver, B.C.
Formation Characteristics: Three sets of circles (11 circles total, with diameters ranging between 19-100 ft.) in field adjacent to runway # 250 of Vanderhoof airport.

Relevant Findings:

(1) **Increased free-radical concentrations in crop formation seedling tissues** - through the application of a published, electrochemical testing procedure[1] we found that the output of tissue-damaging free radicals (released during the respiration cycles of the circle seedlings) was significantly increased relative to the output found in control seedlings;

(2) **Free-radical output increased as the tested circle diameters decreased** (see Fig. 2) - we often find that, in any given crop formation complex, the smaller circles receive greater amounts of the damaging microwave portion of the vortex energy system than do the larger circles in the same event;

(3) **Increased amounts of magnetic material in the soils** – the maximum amount of such material which might be expected to be found in normal soils is 0.4 mg/g-soil. In soil samples here, taken at precise radial locations within the tested circles, the amounts found ranged between 1.0 and 4.0 mg/g-soil, which is statistically significant;

(4) **Amounts of magnetic material found in the soils inside the tested circles were lower than amounts found in soils in a 15m radius outside each tested circle** (see Fig. I) – this finding is in agreement with the laws of physics which deal with forces on particles within a rotating plasma vortex system;

(5) **Microscopic examination of the magnetic particles found in the soils revealed spherically-shaped black beads ranging in size from 1-5 micrometers in diameter** – these particles were uniformly mixed on the surface of what appeared to be a sandy-loam type of soil and their surface structure was typical of magnetite (Fe_3O_4) deposits found in other crop formations.[2]

(6) **Mean plant stem node lengths were extremely uniform in the 3 sampled circles and revealed only about a 5% increase relative to the control plants** - the node lengths were

measured in over 1200 formation and control plants and, although the node length increase found here is relatively minimal (as compared to node length increases often observed in plants from formations which have occurred in younger crop), because of the large number of samples taken (Figs. 3,4,5) the 5% mean node length increase is statistically significant.

Results and Discussion

From the three groups of circles (shown in photographs on cover) the fieldworker chose one from each group for detailed sampling. As requested, he selected circles of different sizes, the largest being 30.5m (Circle "A"), the next largest 15.5m (Circle "C"), and the smallest 4.5m (Circle "D"). Plant and soil samples were meticulously collected at given intervals along several radii inside each of these three circles and numerous control samples were also taken at various distances outside each circle. A total of 112 sample and control plant sets were examined, each with approximately 11 plants per set, or over 1200 plants total.

Node Length Measurements:

An analysis of the node lengths of each plant stem from each of the three sampled circles disclosed a surprising uniformity, relative to what is usually found in crop formation plants examined in this laboratory. These data are summarized in Table 1, along with the data from the control plants.

Table 1
Summarized Node Length Data from Three Sampled Circles and Controls

Circle #	Node Length ave.	Node Length s.d.	Number of Sample Sets	% Node Length Change Relative to Controls
D	1.64	0.12	9	+6.5 %
A	1.62	0.16	24	+5.2
C	1.62	0.15	20	+5.2
Controls	1.54	0.13	60	—

Here we find that the node lengths are essentially identical in each of the sampled circles, all three exhibiting a 5-6 percent increase over the controls; and, because of the large number of samples and controls examined, the increases are statistically significant. This crop formation occurred late in the growing season when the crop was relatively mature; therefore the moisture content inside the plant stems would have been minimal and the outer fibers of the plant stem nodes would not have had the elasticity of younger plants (which often reveal much greater node length changes in response to the microwave component of the plasma eneregy system thought to be responsible for these node alterations).

Magnetic Particles in the Soil:

Soil samples (152 total) were taken at the plant sampling locations, the purpose being to determine the amount and, if present, the microscopic characteristics of any magnetic material found. The usual H-drag tests revealed significantly high levels of magnetic material in and around the immediate vicinity of the circles, in

Spheru Magnetit

excess of the upper limits (0.4 mg/g soil) of such material which might be expected in normal (control) soils. Here we found numerous samples with levels in the range of 2-4 mg/g-soil, or up to a 10 times increase. A microscopic examination revealed the presence of spherical particles (due, again, to the heating effect from the microwaves emitted by the plasma system) of magnetic material, with surface structure very similar to pure magnetite (Fe_3O_4). The levels within and immediately outside the sampled circles are summarized in Table 2.

Table 2
Comparison of Magnetic Material Found in Soil Inside Circles
Compared with Amount Collected in a 15m Radius Surrounding Each Circle

	MATERIAL INSIDE CIRCLES (mg/g-soil)			15m RADIUS OUTSIDE (mg/g-soil)		
Circle #	ave.	s.d.	Number of Sample Sets	ave.	s.d.	Number of Sample Sets
C	0.58	0.12	19	1.19	0.36	22
A	1.60	0.53	24	1.70	0.48	18
D	2.04	0.67	9	2.48	0.88	15

When we compare the level of magnetic material in samples taken within the three circles to the levels found within a 15m radius surrounding each circle, we find that (as shown in Table 2 and graphically in Fig. I) the levels are higher in the immediate vicinity of the circles than they are inside them. These results are not unusual. In many crop formations we find that the distribution of magnetic particles agrees quite closely with a model formulated from the physics of centrifugal forces operating within a rapidly rotating plasma vortex system. *

This model is based on the assumption that the crop formation-iron particle interactions are taking place as hypothesized in our 1995 paper.[2] From this we can explore the physics of the forces acting on the magnetic particles within the rotating plasma system: for a particle moving in a circular path of radius r and at a velocity v, its acceleration a is given by,

$$a = v^2/r \qquad (1)$$

the outward-directed or centrifugal force F on a particle of mass m is computed as,

$$F = mv^2/r \qquad (2)$$

the relationship between the linear velocity v and the angular velocity ω (in revolutions per second) is described by,

$$v = 2\pi r\omega \qquad (3)$$

and by substituting in equation (2) we obtain,

$$F = (4\pi^2\omega^2 m)r \qquad (4)$$

Since the size distribution of the magnetic particles falls within a fairly narrow range (5-10 micrometers) we may take m as representing an average particle mass. Within a given vortex or circle system ω is constant; therefore equation (4) predicts a direct relationship between the centrifugal force exerted on a magnetic particle and its distance from the center of the vortex system.

At the outer boundary edge of each circle the force is at a maximum; however, just beyond this point the angular velocity drops to zero (no rotational action outside the circle area), as does the force F on the particles. Since there is no barrier or "wall" at the edge of the circle the particles' momentum would carry them beyond the confines of the downed-crop areas. This would produce a "fall-out" in the area immediately outside each circle, thus producing the higher concentrations of magnetic particles found in these areas. The fact that the *relative concentrations* inside the circles are in approximate agreement with the levels outside each circle (Fig. 1) would tend to support this model.

Redox Characteristics of Seedlings:

Redox tests[1] were conducted on seeds from sample plants taken near the central region of each circle and on the "far controls" (700-1875 ft. away from circle formations). In numerous crop formation studies we have found that those areas of the crop formation receiving the highest levels of the vortex energies also disclose the highest levels of redox activity (redox ratios) during seedling development. *The higher the ratio, the greater the damage to mitochondria in the seed embryo.* In this case we find that the redox ratios (mean values from a 12-sequence test series) in the circles all lie above the control values: as seen in Fig. 2, the highest value is in the smallest circle (circle "D")—indicating that the level of vortex energy (microwave component) was at the maximum here, relative to the other circles. As was shown in Fig. 1, circle "D" was also found to have the highest level of magnetic material, thus confirming that this circle received the maximum energy level of the three circles tested.

The presence of increased concentrations of magnetic materials in the soil, in conjunction with the increases in the respiration-related, free-radical concentrations in the seedling tissues, strongly indicate that high-energy plasma vortices were involved in the creation and organization of these crop formations.

[1]Levengood, W.C. (1988) *Redox-responsive electrodes applied during plant morphogenesis.* Bioelectrochemistry & Energetics **19**:461-476.

[2]Levengood, W.C. & Burke, J.A. (1995) *Semi-Molten Meteoric Iron Associated with a Crop Formation.* Journal of Scientific Exploration **9**:191-199.

[3]Levengood, W.C. & Talbott, Nancy P. (1999) *Dispersion of Energies in Worldwide Crop Formations.* Physiologia Plantarum **105**:615-624.

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Fig. 1: Distribution of magnetic material in soils inside, and in a 15m radius outside, tested circles at Vanderhoof, Canada 1998 (KS-04-138). Increased concentrations noted immediately outside circles indicates the presence of centrifugal forces operating within a rapidly rotating plasma vortex system.

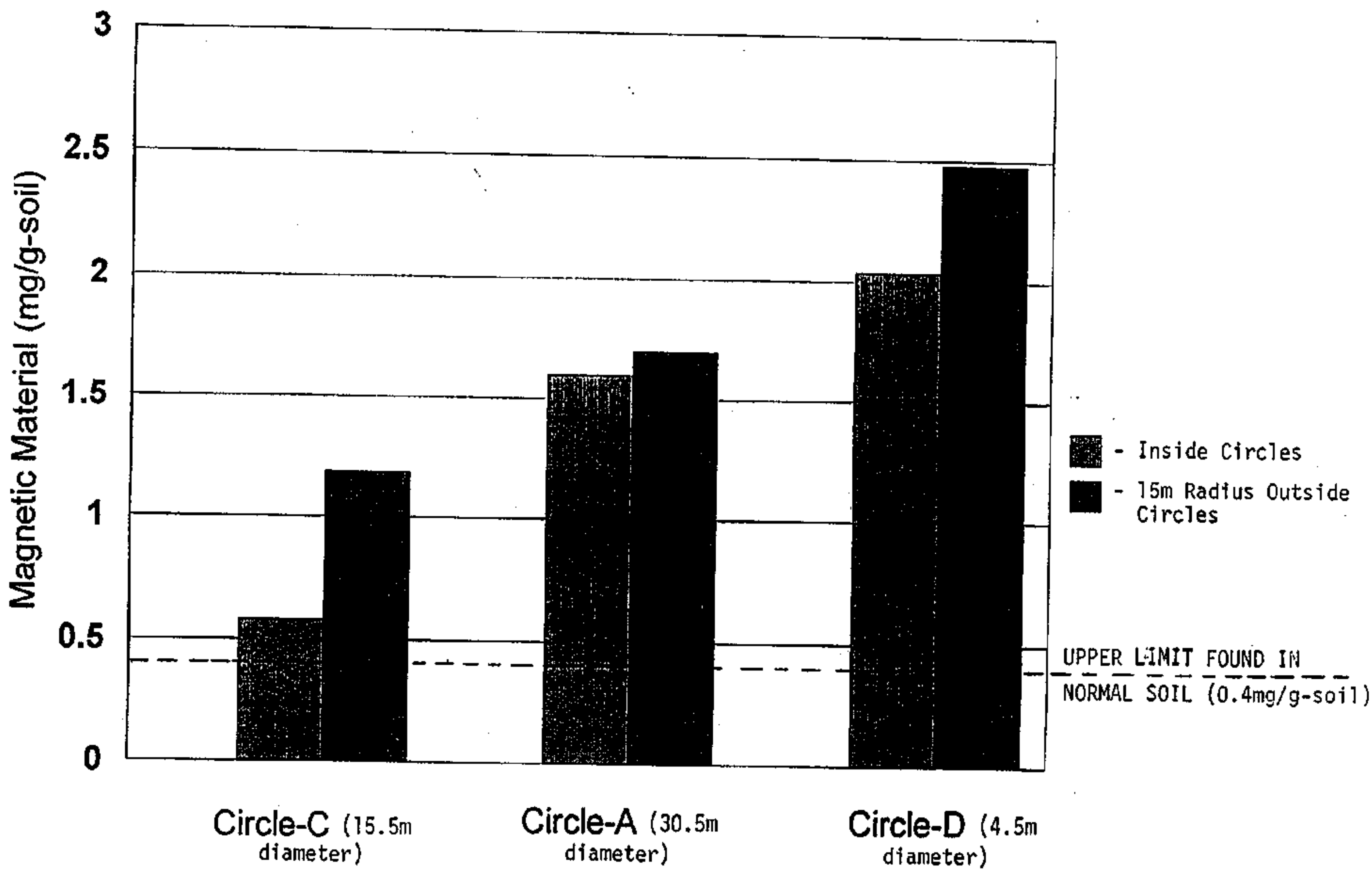

Fig. 2: Relationship between circle diameter and redox ratio in seeds from crop formation at Vanderhoof, Canada, 1998 (KS-04-138). Data reveal that free-radical output (which results from the exposure of the plants to the damaging microwave portion of the plasma system) increases as the size of the circle decreases. [Rr levels from control plants are indicated by dashed line.]

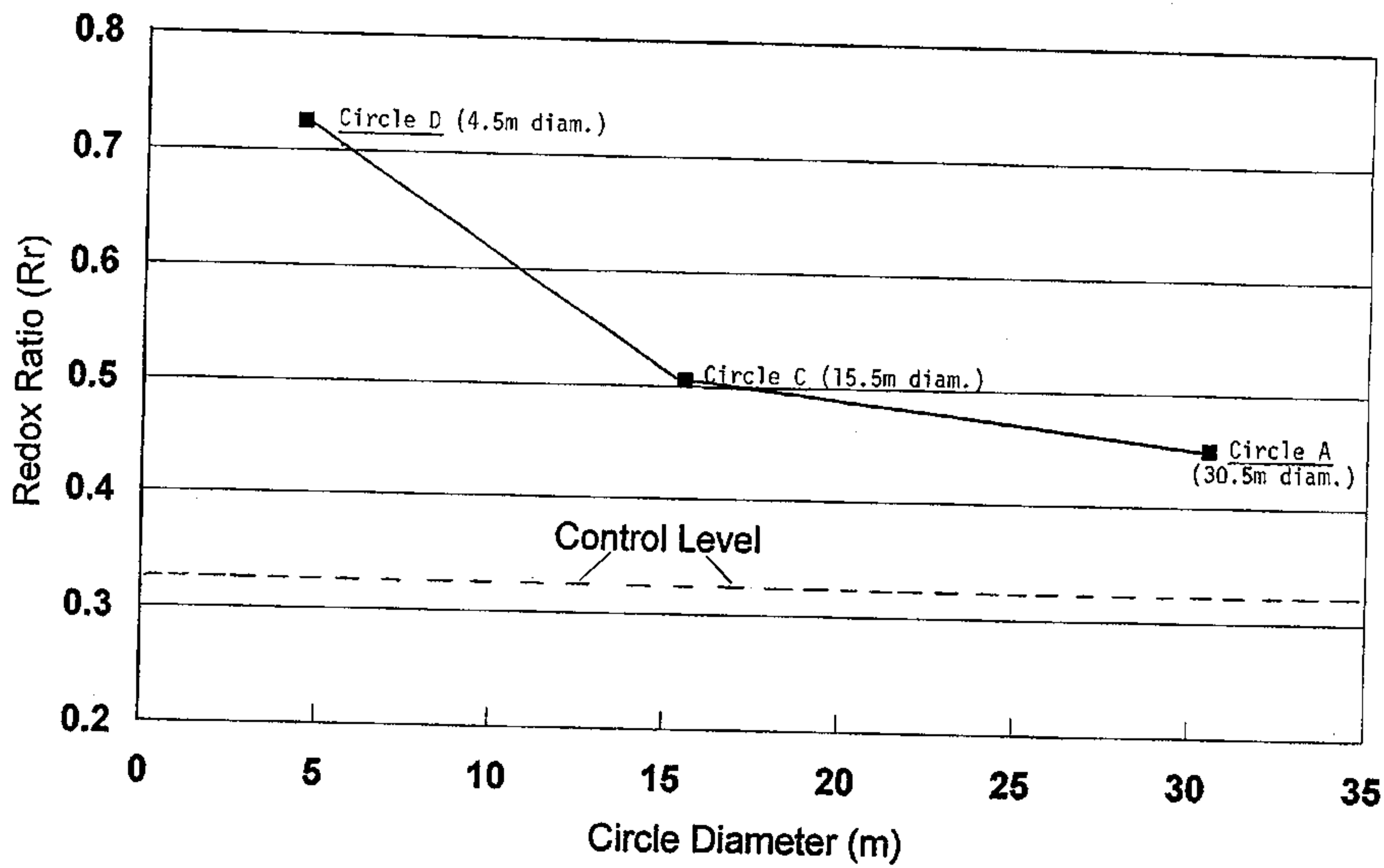

Fig. 3: Field sampling diagram #1, showing location of plant and soil samples taken inside chosen circles (Vanderhoof, Canada, 1998; KS-04-138).

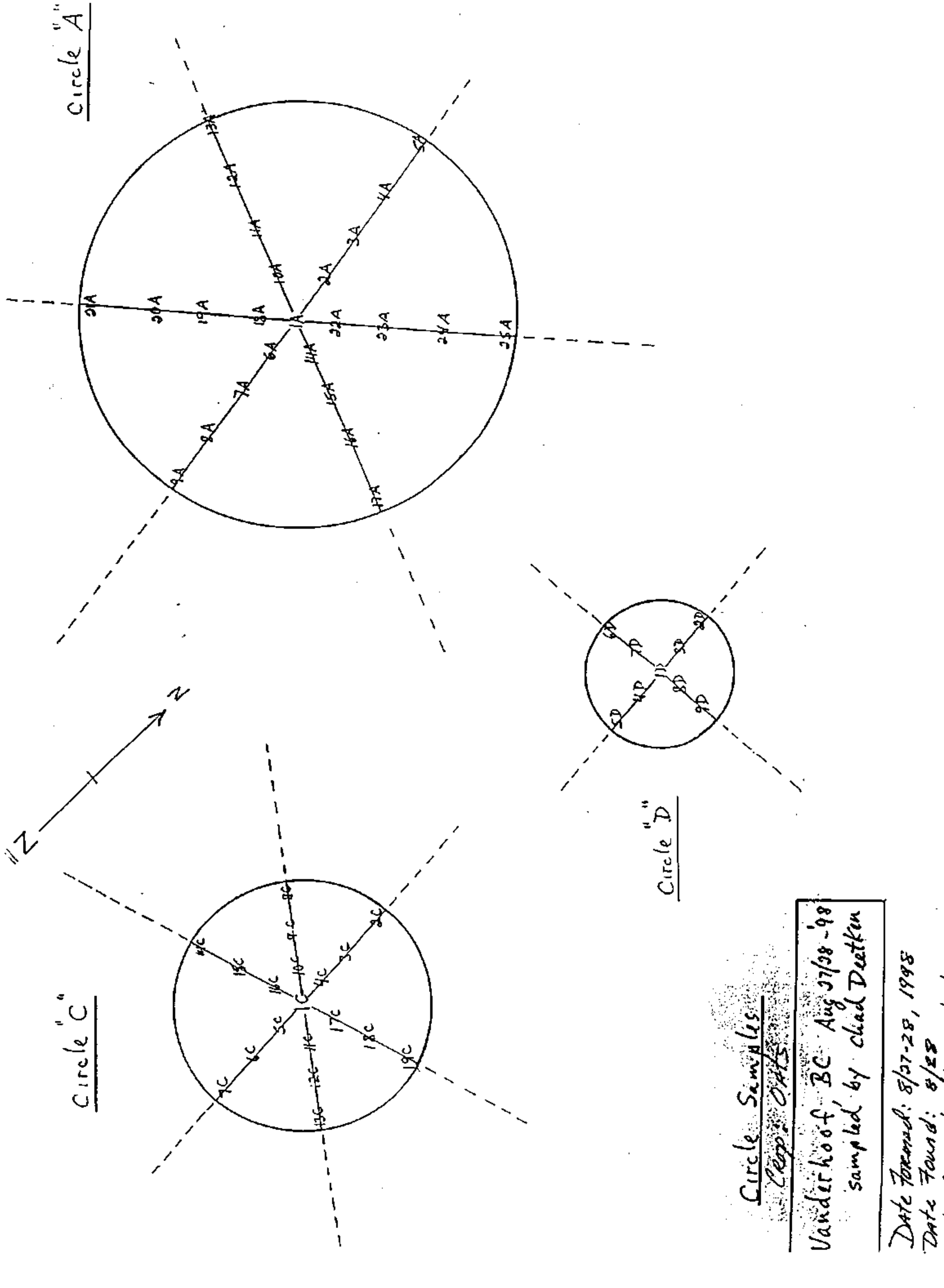

Fig. 4: Field sampling diagram #2, showing location of controls taken outside circles (not including far-distant controls).

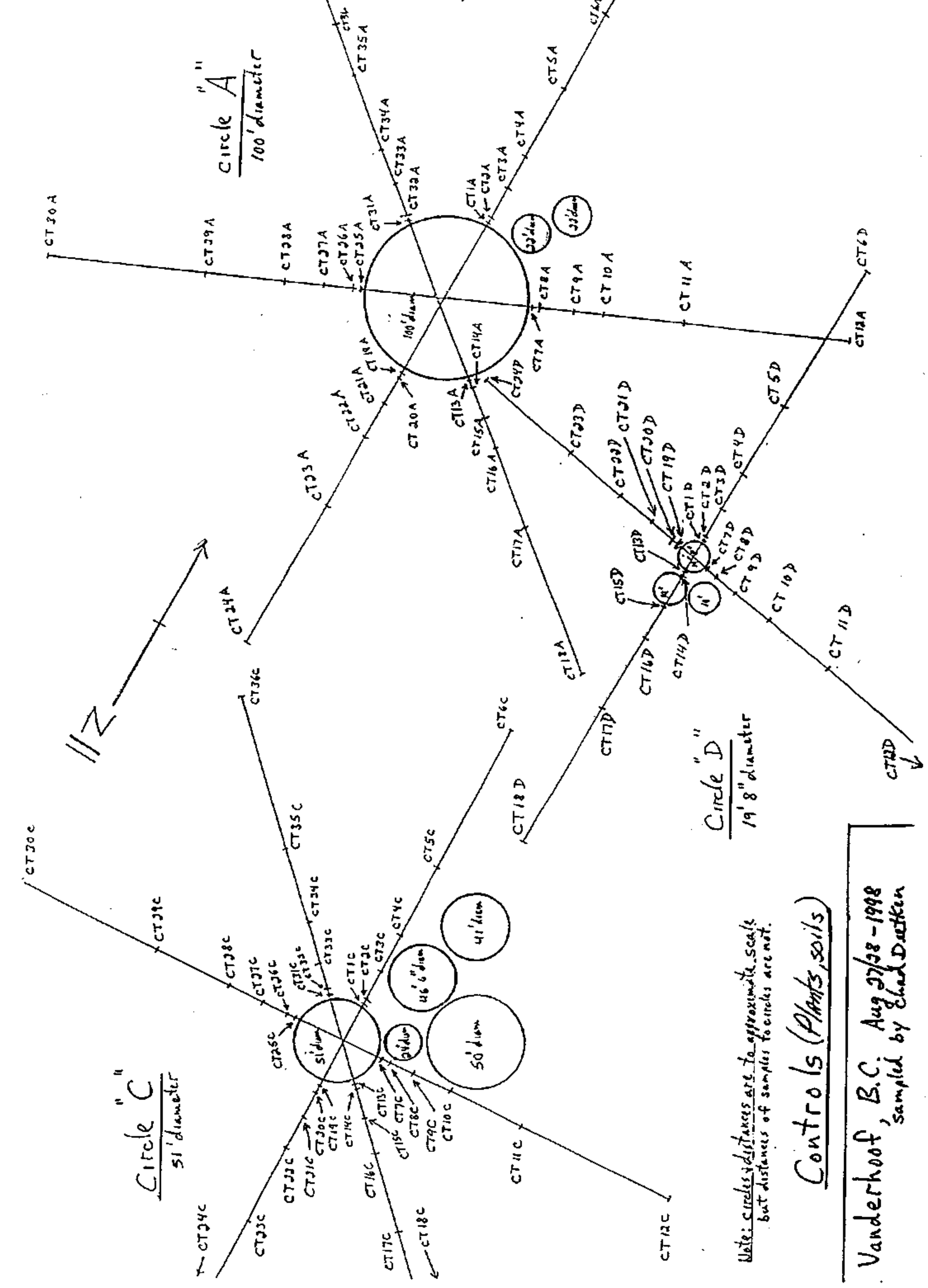

Fig. 5: Field sampling diagram #3, showing location of far-distant plant and soil controls.