



*NORTH AMERICAN  
CROP CIRCLES  
and  
RELATED  
PHYSICAL TRACES  
REPORTED IN 1991*

A Study Conducted by the North American Institute  
for Crop Circle Research

Winnipeg, Manitoba  
Canada

February, 1992

This study was conducted by the North American Institute for Crop Circle Research in conjunction with Ufology Research of Manitoba. Research associates with NAICCR and UFOROM include:  
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North American Crop Circles  
and Related Physical Traces  
Reported in 1991

As in 1990, NAICCR (North American Institute for Crop Circle Research) requested and collected information on UGMs (unusual ground markings) reported in 1991. The 1990 NAICCR report was widely circulated and reprinted in a number of books and publications around the world. The favourable response of the ufology and cerealogical community to NAICCR's efforts encouraged the continuing gathering of data for comparison and analysis.

The principle which guides the collection and dissemination of crop circle data by NAICCR is the open exchange of information for all those involved in the field. It has been suggested that the sharing of information and the co-operation between researchers is a vital aspect of both ufology and cerealogy.

In practice, although requests for information are frequently made, relatively few researchers and investigators respond by sending NAICCR the required data. Typically, local investigators send information to regional directors of their organizations, if they send their information to anyone at all. The quality and style of investigations tend to vary considerably, and therefore make comparative studies very difficult. The need for standardization of investigative techniques is clearly an issue in UGM studies.

As a result, information about many UGMs comes by way of second-hand sources, newsletters, magazines, computer bulletin boards and media reports. Some reports of UGMs are nothing more than rumours, despite attempts to substantiate claims and alleged witnesses' accounts. For these reasons, the usefulness of the data is limited. However, it is the position of NAICCR that the collection and publication of this data are important in the development of the field. At the very least, researchers who perhaps read only a few publications can be apprised of the broader aspect of the phenomena, and the variety of the cases.

While it is admirable that many researchers have taken it upon themselves to study specific cases or aspects of UGMs, those who claim expertise or are portrayed as being very knowledgeable of the subject are sometimes poorly versed in the phenomenon. Indeed, some lack the necessary background to speak with authority on UGMs or related phenomena. This has resulted in some "experts" making unscientific or otherwise unsupported claims during media interviews, contributing to misconceptions about the facts of the phenomenon.

The situation is complicated further by the delineation of "camps" within the UGM field, whether they be vortex theorists, UFO adherents, skeptical refuseniks or ultraterrestrialists. These are additional reasons why an objective presentation of all the raw data from all sources is considered essential in order to gain a more complete understanding of the phenomena. It is the hope of NAICCR that the presentation of North American UGM data in this Report will encourage more co-operation and discussion among researchers at all levels, whether the reader is an armchair theorist, a field investigator or a debunker.

#### Results of the 1991 Study

As of 1 January, 1992, there had been 87 UGMs (unusual ground markings) reported or otherwise communicated to UFOROM (Ufology Research of Manitoba) or NAICCR during the 1991 calendar year. These represented only 37 different sites or locations, since some cases had multiple associated UGMs. The set of UGMs includes those features commonly called "crop circles" as well as the apparently UFO-related "saucer nests", "burn marks" and "landing traces".

The UGMs were classified in the following categories:

1. FC - Flattened Circle
2. FR - Flattened Ring
3. BC - Burned Circle
4. BR - Burned Ring
5. BF - Burned and Flattened
6. CR - Concentric Ring
7. VM - Vegetation Missing
8. VD - Vegetation Dead
9. YG - Yellowing of Grass
10. SG - Stunted Growth
11. EG - Enhanced Growth
12. DP - Depression
13. HO - Hole
14. OT - Other

During 1991, only seven categories were represented: FC, FR, SG, VM, VD, YG, SG and OT. It should be noted that the classification system is not mutually exclusive, and some sites may contain more than one category of UGM.

A problem in the statistical tabulation of UGM data is the lack of standardization in the counting of the UGMs. At some sites, only a single UGM is observed, while at others, there may be dozens. Some researchers have chosen to count each UGM separately, but many count features according to sites. A "quadruplet" may therefore be counted as "4" or "1", depending on the system used. A more complex feature such as an "agriglyph" poses additional problems: is a count of its component circles, triangles, etc., of real analytical value? It was decided to present the data with both counting schemes when possible, and researchers can adopt their own systems for interpretation. There were a few cases in 1991 which seemed to beg for an exception, such as a site with "40 or 50" circles. Such abnormally skewed

counts were not fully reflected in the categorical statistics, but were included in the total UGM count only (see data list).

It is interesting to note that there were nearly the same number of UGMs recorded in 1991 as in 1990. It is too early to speculate on this result, but if this number remains steady in the coming years, it could lend support for the theory that UGMs are a continuing, constant phenomenon like their cousins, UFOs.

Of the 87 total UGMs found in North America, 39 (45%) were in Canada and 48 (55%) were in the United States. When the number of sites is examined, the distribution is essentially the same: 16 (43%) in Canada and 21 (57%) in the United States. The distribution of UGMs differs from 1990, but the site distribution is very similar: 47% in Canada in 1990.

Distribution of UGMs in States and Provinces			
State/Province	USA/CDN	UGMs	Sites
Alberta	Canada	34	11
Arizona	USA	1	1
BC	Canada	1	1
California	USA	1	1
Florida	USA	6	1
Georgia	USA	4	1
Illinois	USA	32	4
Indiana	USA	1	1
Iowa	USA	2	2
Kansas	USA	1	1
Manitoba	Canada	1	1
Nebraska	USA	1	1
New York	USA	1	1
North Carolina	USA	7	2
North Dakota	USA	1	1
Nova Scotia	Canada	1	1
Oklahoma	USA	54	3
Saskatchewan	Canada	2	2
Tennessee	USA	1	1

There was an uneven distribution of UGMs throughout North America in 1991. A significant number of cases were reported in Alberta, which had no UGMs at all in the previous year. No significant clustering effects were noted.

There was a statistical difference in the direction of swirl reported for crop circles. 25 swirls were counterclockwise (76%), and 8 were clockwise (24%). Most swirled UGMs were in Canada. All reported swirls were in flattened circles.

Direction of Swirl (When Specified)		
	USA	Canada
Clockwise	1	7
Counterclockwise	2	23

Number of UGMs by Crop and Country		
Crop	USA	Canada
Barley		3
Corn	3	
Grass	19	10
Mustard		1
Rye	3	
Soybeans	7	
Wheat	1	23

Most grass circles were in the United States, whereas wheat circles were almost exclusively in Canada. There was no evident trend with regard to other crops, though it can be noted that UGMs have been discovered in a variety of crops other than wheat and corn.

Number of UGMs by Crop (When Specified)	
Barley	3
Corn	3
Grass	29
Mustard	1
Rye	3
Soybeans	7
Wheat	24
Not Specified	17

Number of UGMs by Type (When Specified)	
Burned Circle	1
Flattened Circle	58
Flattened Ring	1
Hole	6
Stunted Growth	3
Vegetation Dead	4
Vegetation Missing	1
Yellowed Grass	1
Other	3
Not Specified	9

The following is a tabulation of crop type by UGM type:

	Barley	Corn	Grass	Mustard	Rye	Soy	Wheat
FC	3	2	22	1		6	23
FR		1					
SG			2				1
VD					3	1	
VM			1				
YG			1				
OT		2					

(Unspecified crop or UGM type cases were excluded from the above table.)

The average diameter of UGMs, when reported, was 7.19 metres in the primary axis and 6.94 metres in the secondary axis (in the case of elliptical UGMs). The two axes values give an average of 7.06 metres. This is slightly smaller than the 1990 average of 10.7 metres.

This listing of UGM data does not include any indication of the investigations and conclusions reached by researchers regarding the cause or reason for the existence of the features. The limited information available for these analyses precluded any extensive discussion of the individual cases. Some information about the cases will be found in the annotated case list later in this report. Sources of information about the cases are provided, but researchers intending to use this data in their own studies are cautioned that NAICCR cannot vouch for the accuracy of reports.

The first "agrighlyph" or "pictogram" found in North America was recorded in 1991, near the town of Coalhurst, Alberta. This feature received considerable media coverage, and was certainly the most spectacular site discovered since the current wave of crop circles. The Coalhurst site does not bear much resemblance to the more familiar British agrighlyphs, which were generally linear formations. The Coalhurst agrighlyph covered a wide area, consisting of several circles arranged roughly in a ring and joined by both straight and curved corridors. Corridors extended on one side of the feature to join a long, distended "F" figure formed in the crop. There were other sites located about this same time which consisted of circles joined with corridors as well.

The question of physical or physiological effects reported at UGM sites should also be addressed here. It has been claimed that electronic interference is sometimes experienced within or in the proximity of British crop circles. Convincing support for this claim is much debated, but such effects have been noted in many cases, usually as an indication that UFOs have been involved. Sometimes, vortex theorists imply that these effects may be related to plasma activity in the surrounding area.

In 1991, several North American UGM sites were claimed to have associated effects. Some sites were said to exhibit a positive effect when dowsed, while other sites produced eerie "energy", detected by sensitives. A number of unusual physical effects were reported, such as malfunctioning microwave ovens and radar detectors which went off near crop circle sites. Unfortunately, these effects did not seem to be consistent, and they were not experienced by all witnesses or investigators at the same site.

A few sites were alleged to have significant radioactivity above normal background levels. However, careful spectroscopic analyses of soil and grain samples from the sites yielded inconsistent or negative results. As this report was being prepared, analyses of some samples were still not available.

#### The Bower/Chorley Hoaxes

Towards the end of the summer in 1991, two self-described "artists" approached the British media with their story that they had been hoaxing crop circles in England for over ten years. Within a very short time, the story was carried around the world, and the two men, Bower and Chorley, were hailed as the pranksters of the decade. It was suggested that "all" the reported crop circles during the past number of years were explained as the work of these two clever individuals. As proof of their claim, the men were filmed creating a formation with planks and rope. Then, crop circle "experts" were brought unawares to the site where they pronounced the formation "authentic".

In the opinion of many people, especially the media, this hoax admission effectively solved the mystery of crop circles. The claims seemed to lend support to the contention of debunkers of the phenomenon that all the formations were the work of hoaxers.

The Bower/Chorley hoax admission is but one of many that have been claimed and investigated during the past ten years. According to some researchers, as much as 75% of all crop circles discovered may be hoaxes. This is very possible, since a number of hoaxers have been caught by investigators, even before the Bower/Chorley story was made public.

A further obstacle to the unquestioning acceptance that hoaxes can account for all reported crop circles is the possibility that some UGMs can be caused by wind or "vortex" effects. There is some evidence that simple, circular areas of flattened crops can be produced by rotating winds under ideal conditions, according to some meteorologists (other meteorologists, however, are not supportive of the idea). If this is true, then some UGMs may be caused by natural phenomena. The implications of this are significant.

If some crop circles are caused by wind effects (or indeed the infamous "plasma vortex" described by some researchers), then the hoax explanation is not universal. If so, then the "mystery" of the creation of crop circles is still worthy of discussion. Despite the arguments of those wishing to dismiss the phenomenon, it would appear that the hoax admissions have done little to change the status of the problem. Thus, there are still several possible explanations for individual crop circles (or UGMs):

1. Hoaxes
2. Meteorological Phenomena
3. UFOs
4. Soil/Crop Pathological Phenomena
5. Manmade Effects

Manmade effects include suggested deliberate government/military tests of "secret weapons". The possibility that UFOs (or, specifically, the actions of speculated extraterrestrials) are somehow responsible for UGMs will always exist. The existence of life elsewhere in the universe is generally accepted by researchers, and the actions and capabilities of such creatures are essentially unknowable. However, there is no incontrovertible evidence that such beings are visiting Earth. It is likely that a complete description of the causes of crop circles will comprise more than one of the above categories.

Finally, a note should be made about the difficulty in investigating UGM cases in North America. British researchers have occasionally commented upon the lack of coherent efforts and information sharing that appear to be the case with respect to crop circle investigations in North America. Reasons for this include the much larger area which much be covered by unfunded investigators. While many of the reported British crop circles were found within an area of only a few hundred miles in diameter, the North American circles are found throughout the continent, separated by thousands of miles. The travel time to investigate a site is therefore not insignificant; in one instance, members of the Alberta UFO Study Group, based in Edmonton, travelled for five hours to reach the Lethbridge formations. The investigation of UGMs in distant parts of the United States by NAICCR is obviously impractical, and information about such sites is dependent upon researchers in the immediate area. Again, this strongly speaks for more data-sharing and co-operation between researchers.

It is hoped that research into UGMs will benefit from studies of the raw data. Researchers are urged to examine the data presented and prepare their own interpretations in order to further develop their theories about the origins of UGMs or the specific category of crop circles.

Annotated Listing of North American UGMs Reported in 1991

1. 910316 Fort Lawrence, Nova Scotia A ring with a width of 12 inches and a diameter of 30 feet was discovered in a grassy field. It had not been present last fall, but was discovered after the snow had melted. A compass needle was said to spin rapidly when outside the ring, but was unaffected inside the ring. However, dowsing rods crossed when at the center of the ring. Agriculture specialists could not explain the observed effects as due to a pesticide, disease or nematodes.  
Source: Halifax Chronicle-Herald, 22 April 1991  
Halifax Chronicle-Herald, 24 April 1991
  
2. 910500 Indianapolis, Indiana A large semicircular pattern "about the size of a small house" was found in 3-foot tall reedy grass. The grass was found laying flat on the ground. There were no tracks or other indication of how entry was gained into the area.  
Source: Lou Farish's UFO Newsclipping Service #264  
Michael Chorost
  
3. 910515 Tulsa, Oklahoma A swirled, circular area was found in a field on the property of a private school east of Tulsa.  
Source: CUFOS
  
4. 910518 Dandridge, Tennessee A perfectly circular ring of grass was found "mashed" and swirled clockwise. Its diameter was 28 feet, and there was an area about 5.5 feet in diameter that was unaffected. Cattle appeared to shy away from the area, but those that ventured near were said to have become sick. A strange rash was said to have appeared on the arms of one witness who examined the site. It was reported that there was an abnormally high level of radiation in the area, though tests could not confirm this. Two months earlier, a police officer had filmed a nocturnal light UFO in the sky not far from the site.  
Source: Lou Farish's UFO Newsclipping Service #263  
MUFON
  
5. 910600 Florida There were six separate reports of smooth-sided, circular, flat-bottomed holes which apparently appeared overnight in fields. There were no tracks or evidence of digging or hauling, and no trace of the missing dirt. The holes ranged in diameter from 5 yards to 33 yards and were at least as deep. The holes were reportedly different from sinkholes.  
Source: Arkansas MUFON

6. 910600 Morse, Saskatchewan A farmer reported finding a strange, rectangular patch in his field. It was aligned straight N-S, and was on a knoll. No crop grew inside the area.  
Source: UFOROM
7. 910616 Fargo, Oklahoma Three "giant rings" were found in rye fields. The vegetation had died within the rings, but tests soil samples did not suggest a cause. An investigator found "unusual energy patterns" by dowsing the rings.  
Source: Lou Farish's UFO Newsclipping Service #264,265  
Michael Chorost
8. 910616 Troy, Illinois Two crop circles were found in a field. Several days later, UFOs were seen in the area, one shining a beam of light onto the area.  
Source: Linda Howe
9. 910700 Winnipeg, Manitoba A newspaper reporter claimed that an anonymous caller had said a crop circle had been found on a certain property in a rural part of the city. Investigators could not substantiate the claim, and the case was thought to be a hoax.  
Source: NAICCR
10. 910700 Apache Junction, Arizona A large area of wild grass and desert scrub was found "mashed" and "matted". The irregular area had a diameter of 25 to 30 feet and was only 50 feet away from a farmhouse. It was suggested that a storm had caused the effects.  
Source: Linda Bird
11. 910700 Boody, Illinois A line of 29 circles of dying soybeans appeared in a field near Decatur. Agronomists suggested the UGMs were caused by a leaky oil line.  
Source: David Stager
12. 910700 Livelong, Saskatchewan A flattened circle was discovered in an isolated hay field many miles from any easily-accessible roadway. Its diameter was estimated to be 30 feet.  
Source: Vince Migliore  
Hermann Austensen
13. 910705 Medina, New York A 20-foot circle of flattened wheat was found. The crop was "overlapping and laying in every direction". There was no sign of entry into the field.  
Source: Lou Farish's UFO Newsclipping Service #265

14. 910723 Sidney, British Columbia A neat circle of "missing grass" appeared on a church lawn. The grass grew fully back in 3 days.  
Source: Michael Strainic  
Lorne Goldfader
15. 910800 Foss, Oklahoma About "40 or 50 scorched circles" were found in several fields.  
Source: Michael Chorost
16. 910800 Matthews, North Carolina Several circles were reported found in a yard. The owner of the property had not thought to make a report until he had heard news reports about other circles in the area. The circles are relatively small, looking like "doughnuts" with rings of brown discolourization surrounding circular patches of healthy, green grass.  
Source: Various news clippings
17. 910800 Nebraska A crop circle was reported.  
Source: Grant Cameron
18. 910808 Charlotte, North Carolina Numerous circles of flattened vegetation were found following a period of violent storm activity. However, meteorologists did not think that weather was the cause. Plants soon began springing back up "due to heat and sun evaporating the rain".  
Source: Dianne Walker  
KING-TV (Seattle)
19. 910816 Atlanta, Georgia Three circles were found in a grassy field, in line with a radio tower. The one farthest from the tower had a concentric ring. Plants appeared interwoven in a spiral pattern, and continued to grow, despite being bent. Unusual objects such as a mutilated bird and a circuit board were found near the center of one circle.  
Source: Becky Long
20. 910821 Lethbridge, Alberta A group of four crop circles were found in a field adjacent to a television station on the outskirts of the city. Three had "corridors" linking each other. Investigators from various agencies could not find any firm evidence of hoaxing.  
Source: AUFOSG
21. 910821 Lethbridge, Alberta A "crop circle" was found on the grounds of an amusement park. It was shown to have been caused by a maladjusted sprinkler system.  
Source: AUFOSG

22. 910821 Lethbridge, Alberta A news reporter found a "crop circle" in a field near the city. Investigators found an area matted by lodging.  
Source: AUFOSG
23. 910822 Bluegrass, Iowa A circle was found in a cornfield. Stalks were not broken, but lay flat against the ground. Two witnesses reported seeing UFOs in the area. A third witness heard a "rumbling, bumping sound" the same night.  
Source: James Black  
Michael Chorost
24. 910825 Bluegrass, Iowa A circle was found in a cornfield, but appeared to have been caused by hoaxers.  
Source: James Black  
Michael Chorost
25. 910827 Okotoks, Alberta A triplet of crop circles was found in a barley field. Corridors connected the three circles, which were arranged in a line and swirled in a counter-clockwise direction. The centers of the circles were disturbed; investigators suspect hoaxers were involved.  
Source: AUFOSG
26. 910828 Granum, Alberta A report was received of a UFO which appeared to land in front of a firehall. Things like "landing pads" came out of the landed craft before it took off and disappeared. An area of "bleached" soil was found.  
Source: AUFOSG
27. 910831 Coalhurst, Alberta A complex "agriglyph" was found in a field. The formation consisted of seven circles connected by corridors and joined to other long corridors which made the shape of the letter "F".  
Source: Sherri Gallant  
AUFOSG  
Chad Deetken
28. 910831 Coalhurst, Alberta A triplet of circles was found, joined by a series of corridors. "Negative" and "positive power" was sensed by some investigators.  
Source: Sherri Gallant  
AUFOSG  
Chad Deetken
29. 910831 Coalhurst, Alberta A triplet of circles was discovered, joined by corridors.  
Source: AUFOSG  
Chad Deetken

30. 910800 Merced, California A crop circle formation was found in a corn field. It was attributed to water damage. Source: Vince Migliore
31. 910900 Kansas It was widely reported that an "agriglyph" was found in a wheat field. It was claimed that military investigators destroyed the formation before it could be examined by civilians. Source: Linda Howe
32. 910900 Chicago, Illinois Three crop circles were found in a close formation. No explanation was found. Source: Michael Chorost
33. 910900 North Dakota A UGM was reported found on a range. Source: John Salter, Jr.
34. 910903 Lethbridge, Alberta A crop circle was discovered in a mustard field. The field was swathed before investigators could reach the scene. Source: AUFOSG
35. 910903 Warner, Alberta A pattern of 4 circles was found in a wheat field. There was no sign of entry into the area. Various electronic malfunctions were claimed. Dogs were said to have barked one night before the discovery of the formation. Source: AUFOSG  
Chad Deetken
36. 911000 Blood Indian Reserve, Alberta A formation of 6 circles was found in a grassy field near a house. A number of unusual effects were concurrently reported, including charred hay bales, exploded Christmas lights and a car window that appeared to have been smashed outward. Source: AUFOSG  
Michael Strainic
37. 911000 Argonne, Illinois At least 10 circles were found on some river islands. The circles are swirled and depressed, and made in long marsh grass. Some circles were over 100 feet in diameter. Because of the nature of the swampy area, the site has not been fully explored. It is not known how long ago the circles were created. Higher-than-normal radiation levels were detected at the site. Source: Kevin Folta  
Sheldon Wernikoff

Coding Key for UGM Data

EXAMPLE:

910827	OKOTOXS	AL	CN	03	BY	FC	CC	4.80	4.50	-	CSTM	45
D	S	R	C	N	C	T	S	D	D	W	O	U
A	I	E	O	U	R	Y	W	I	I	I	T	C
T	T	G	U	M	O	P	I	A	A	D	H	M
E	E	I	N	B	P	Z	R	M	M	T	E	
		O	T	E			L			H	E	
		N	R	R				1	2			
			Y									

- DATE: 6-digit date code in the form: YR/MO/DA
- SITE: Geographical location nearest the UGM, such as a town, city, hamlet, etc.
- REGION: State or Province, as a 2-digit code
- COUNTRY: US or CN
- NUMBER: Number of UGMs at the site; if only one, then one entry: 01; if two, then two entries: 01 and 02; if three, then 01, 02, 03; etc.  
If more than 10, only one entry: if 50 UGMs, then code is 50
- CROP: 2-digit code for crop: BY = Barley; CN = Corn; GR = Grass; MU = Mustard; RY = Rye; SY = Soybeans; WH = Wheat
- TYPE: 2-digit code for UGM type: NC = Burned Circle; FC = Flattened Circle; PE = Flattened Ring; HO = Hole; OT = Other; SG = Stunted Growth; VD = Vegetation Dead; VM = Vegetation Missing; YG = Yellowed Grass
- SWIRL: CC = CounterClockwise or CW = Clockwise
- DIAM 1: Diameter of UGM in metres
- DIAM 2: Perpendicular Diameter in metres (for eccentric, elliptic or irregular UGMs)
- WIDTH: Width of Ring in metres (for UGMs that are rings rather than whole circles)
- OTHER: Miscellaneous comments: A = Animal reactions; C = Corridor; D = Dowsed; E = Explained; G = Agriglyph; H = Proven Hoax; I = Insufficient data; M = Other Marks or traces; P = Physiological effects; R = Radiation detected; S = Samples taken; T = Tests on soil or vegetation performed; U = UFO sighted; W = Wind effects
- UGM #: Numerical assignment in listing

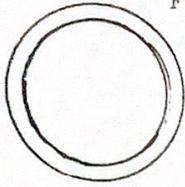
North American UGMs Reported in 1991

date	site	region	country	number	crop	type	swirl	diam1	diam2	WIDTH	OTHER	UGM No.
<====	(=====	<=	<=	<=	<=	<=	<=	----	----	----	<=====	<=
910316	FORT LAWRENCE	NS	CN	01	CR	SC		9.23		0.28	SDT	1
910500	INDIANAPOLIS	IN	US	01	CR	OT		9.00				2
910515	TULSA	OK	US	01	CR	FC		13.95				3
910518	DANDRIDGE	TN	US	01	CR	FC	CW	9.62		3.46	ARPU	4
910600		FL	US	01		HO		4.68				5
910600		FL	US	02		HO		4.68				6
910600		FL	US	03		HO		4.68				7
910600		FL	US	04		HO		4.68				8
910600		FL	US	05		HO		30.46				9
910600		FL	US	06		HO		30.46				10
910600	MORSE	SK	CN	01	WH	SC		12.30	3.05			11
910616	FARGO	OK	US	01	RY	VD		3.08			STD	12
910616	FARGO	OK	US	02	RY	VD		7.70			STD	13
910616	FARGO	OK	US	03	RY	VD		9.23			STD	14
910616	TROY	IL	US	01							U	15
910616	TROY	IL	US	02							U	16
910700	WINNIPEG	MB	CN	01							H	17
910700	APACHE JUNCTION	AZ	US	01	CR	OT		7.60	9.23		H	18
910700	BOODY	IL	US	29	SY	VD					ST	19
910700	LIVELONG	SK	CN	01	CR	FC		9.23				20
910705	MEDINA	NY	US	01	WH	FC		6.15			ST	21
910723	SIDNEY	BC	CN	01	CR	VM		3.07		0.33	M	22
910900	FOSS	OK	US	50		BC					I	23
910800	MATTHEWS	NC	US	01	GR	YC					I	24
910800		NB	US	01							I	25
910808	CHARLOTTE	NC	US	01	SY	FC		0.62				26
910808	CHARLOTTE	NC	US	02	SY	FC		0.62				27
910808	CHARLOTTE	NC	US	03	SY	FC		6.15				28
910808	CHARLOTTE	NC	US	04	SY	FC		6.15				29
910808	CHARLOTTE	NC	US	05	SY	FC		6.15				30
910808	CHARLOTTE	NC	US	06	SY	FC		10.77				31
910816	ATLANTA	GA	US	01	GR	FC		7.38			M	32
910816	ATLANTA	GA	US	02	GR	FC		14.77			M	33
910816	ATLANTA	GA	US	03	GR	FC						34
910816	ATLANTA	GA	US	04	GR	FR						35
910821	LETHBRIDGE	AL	CN	01	WH	FC	CC	5.70	4.70		ST	36
910821	LETHBRIDGE	AL	CN	02	WH	FC	CW	7.70	6.60		CST	37
910821	LETHBRIDGE	AL	CN	03	WH	FC	CC	2.60	2.20		CST	38
910821	LETHBRIDGE	AL	CN	04	WH	FC	CC	2.00			CST	39
910821	LETHBRIDGE	AL	CN	01	GR	SC					E	40
910821	LETHBRIDGE	AL	CN	01	WH	FC						41
910822	BLUE GRASS	IA	US	01	CN	FC	CC	14.30			U	42
910826	BLUE GRASS	IA	US	01	CN	FC	CC	14.00			H	43
910827	OKOTOKS	AL	CN	01	BY	FC	CC	17.60	17.40		CSTM	44
910827	OKOTOKS	AL	CN	02	BY	FC	CC	4.70	4.50		CSTM	45
910827	OKOTOKS	AL	CN	03	BY	FC	CC	4.80	4.50		CSTM	46
910828	GRANUM	AL	CN	01		OT					U	47
910831	COALHURST	AL	CN	01	WH	FC	CC	2.27			CC	48
910831	COALHURST	AL	CN	02	WH	FC	CC	2.55			CC	49
910831	COALHURST	AL	CN	03	WH	FC	CC	4.77			CC	50

North American UCMs Reported in 1991

date	site	region	country	number	crop	type	swirl	diam1	diam2	WIDTH	OTHER	UCM No.
<=====	<=====	<=	<=	<=	<=	<=	<=	---	---	---	<=====	<=
910831	COALHURST	AL	CN	04	WH	FC	CC	5.85			CG	51
910831	COALHURST	AL	CN	05	WH	FC	CC	5.54	5.38		CC	52
910831	COALHURST	AL	CN	06	WH	FC	CC	6.36	6.15		CC	53
910831	COALHURST	AL	CN	07	WH	FC	CC	9.18	9.03		CC	54
910831	COALHURST	AL	CN	01	WH	FC	CW	2.72	2.46		CCD	55
910831	COALHURST	AL	CN	02	WH	FC	CW	4.87	4.61		CCD	56
910831	COALHURST	AL	CN	03	WH	FC	CW	5.54	5.31		CCD	57
910831	COALHURST	AL	CN	01	WH	FC	CW	3.38	3.15		C	58
910831	COALHURST	AL	CN	02	WH	FC	CC	3.90	2.77		C	59
910831	COALHURST	AL	CN	03	WH	FC	CC	4.31	4.10		C	60
910900	MERCED	CA	US	01		CN					I	61
910900		KS	US			FC					CGI	62
910900	CHICAGO	IL	US	01							IST	63
910900	CHICAGO	IL	US	02							IST	64
910900	CHICAGO	IL	US	03							IST	65
910900		ND	US	01							I	66
910903	LETHBRIDGE	AL	CN	01	MU	FC						67
910903	WARNER	AL	CN	01	WH	FC	CW	5.20			AZ	68
910903	WARNER	AL	CN	02	WH	FC	CC	7.00	6.90		AZ	69
910903	WARNER	AL	CN	03	WH	FC	CW	11.30	11.00		AZ	70
910903	WARNER	AL	CN	04	WH	FC	CC	11.60	11.40		AZ	71
911000	BLOOD INDIAN RESERVE	AL	CN	01	GR	FC	CC	3.00			Z	72
911000	BLOOD INDIAN RESERVE	AL	CN	02	GR	FC	CC	3.00			Z	73
911000	BLOOD INDIAN RESERVE	AL	CN	03	GR	FC	CC	3.00			Z	74
911000	BLOOD INDIAN RESERVE	AL	CN	04	GR	FC	CC	3.00			Z	75
911000	BLOOD INDIAN RESERVE	AL	CN	05	GR	FC	CC	3.00			Z	76
911000	BLOOD INDIAN RESERVE	AL	CN	06	GR	FC	CC	3.00			Z	77
911000	ARGONNE	IL	US	01	GR	FC					IR	78
911000	ARGONNE	IL	US	02	GR	FC					IR	79
911000	ARGONNE	IL	US	03	GR	FC					IR	80
911000	ARGONNE	IL	US	04	GR	FC					IR	81
911000	ARGONNE	IL	US	05	GR	FC					IR	82
911000	ARGONNE	IL	US	06	GR	FC					IR	83
911000	ARGONNE	IL	US	07	GR	FC					IR	84
911000	ARGONNE	IL	US	08	GR	FC					IR	85
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911000	ARGONNE	IL	US	10	GR	FC					IR	87

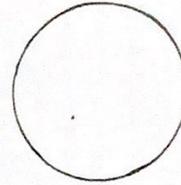
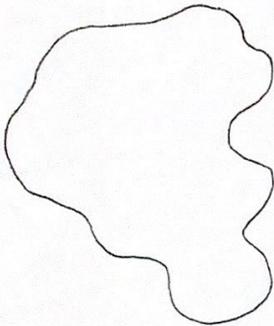
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Fort Lawrence, NS



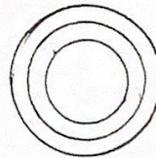
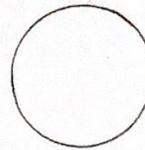
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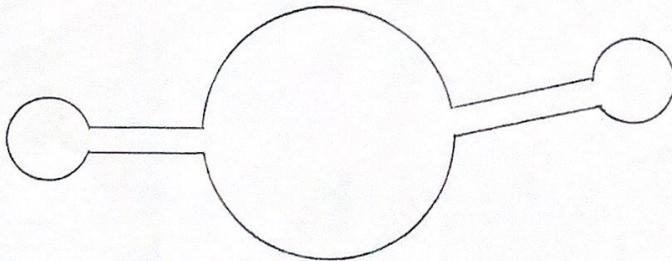
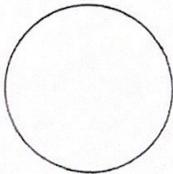
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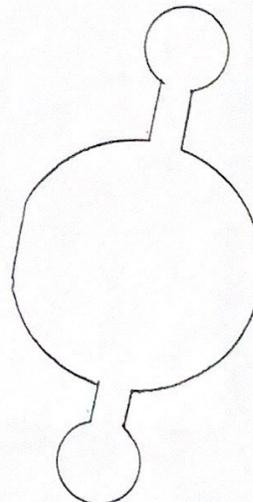
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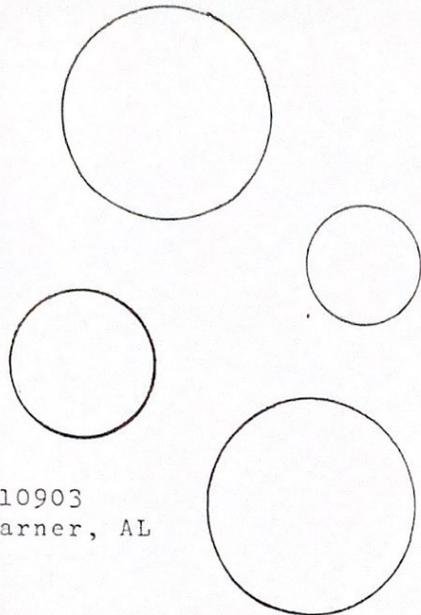


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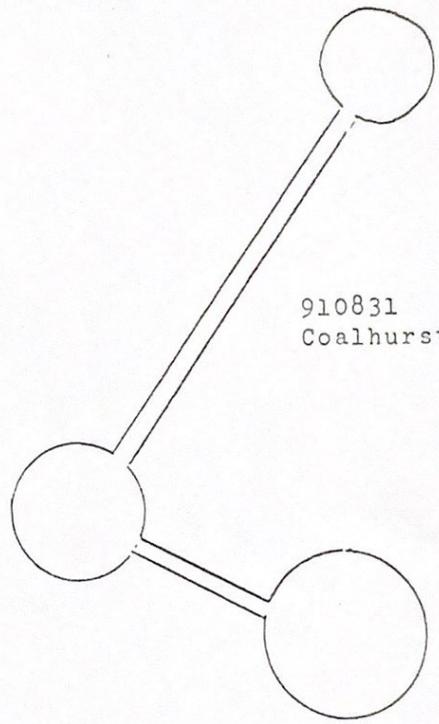


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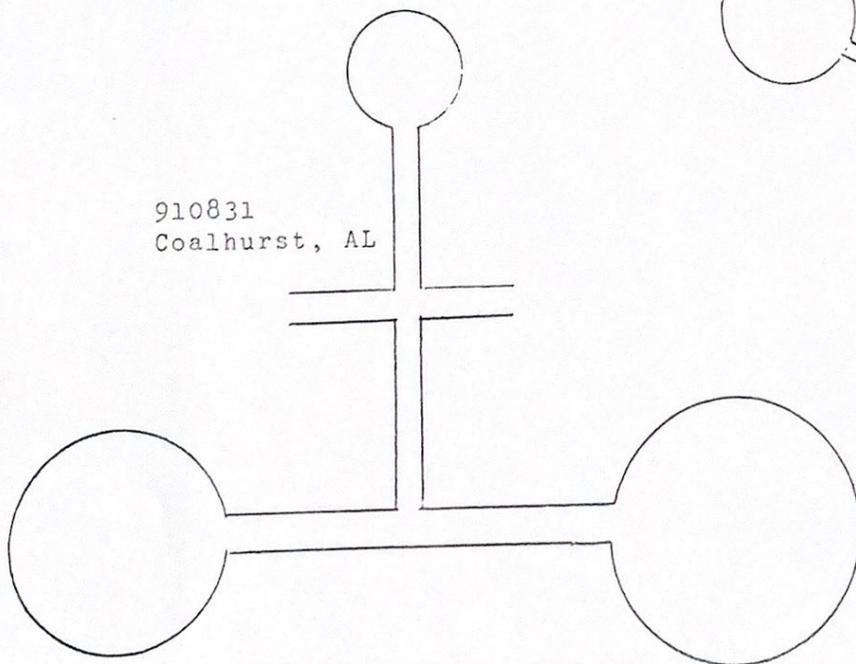




910903  
Warner, AL



910831  
Coalhurst, AL



910831  
Coalhurst, AL

910831  
Coalhurst, AL

