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Dr. Carol Windels Relates to Plans and Goals for Her Research

By Dr. Carol Windels

In June, 1984, I joined the Experiment Station as it's first in-residence research plant pathologist. Over the years, various diseases in northwest Minnesota have been studied by plant pathologists from the University of Minnesota, St. Paul campus. Because of this, my approach is to research other important, but unstudied, diseases in this region. This rationale has turned my attention to diseases caused by soilborne fungi. These diseases are caused by fungi that live and survive in soil, and which can attack and kill seedlings, cause root rot and wilt, and reduce crop quality and yield. Diseases caused by soilborne fungi are often overlooked, difficult to diagnose in the field, and are sometimes confused with soil fertility or herbicide problems. Yet, they are a problem wherever crops are grown. Several areas of research are currently underway.

Sugarbeet growers sometimes have difficulty establishing good seedling stands (which is especially noticeable when planting-to-stand. This season, seedlings were collected from several such "problems" fields, an experience which exposed me to several problems that mimic root diseases - including wind damage, insects, herbicide injury and "cultivator blight". But there were diseases in some selected fields, too - primarily *Rhizoctonia* (throughout the Valley) and *Aphanomyces* (in the southern end of the Valley). Studies are underway to look at ways to reduce and manage root diseases, including trials on seed treatment fungicides, crop rotations, and tillage practices.

This summer, experimental trials and surveys to determine what effect root diseases have on growth and yield of spring wheat, showed that "common root rot" is widespread in the area. Roots were infected, in many cases, even before the plants headed out. Common root rot fungi

include *Helminthosporium* (which also causes spot blotch on leaves and black point on kernels of both wheat and barley) and *Fusarium* (which also causes head scab on both wheat and barley). Root rot of wheat is being evaluated as it relates to conservation tillage and soil fertility in cooperative studies with Dr. John Lamb, Soil Scientist at the Experiment Station.

Since corn is a crop of growing acreage in the Red River Valley, a study is scheduled for this fall to see if stalk rot is present, and if so, to identify what fungi are causing it. In other parts of the USA,

the fungus that most commonly causes stalk rot on corn is *Fusarium* - the same fungus that causes scab of wheat and barley. This study should answer the question regarding whether or not corn poses a potential threat to small grain production in the area.

These studies represent a small fraction of the many possible diseases of crops that need investigation. As time passes, research programs develop and disease problems shift. I hope to keep research relevant in meeting the needs of agriculture in northwest Minnesota.



Dr. Windels evaluating plants grown in the greenhouse in early spring in soils selected from area farms.

This archival publication may not reflect current scientific knowledge or recommendations.
Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.

Smith's Comments



The killing frost of last evening ended all speculation as to the fate of the corn and soybean crops on the Station. The cool summer temperatures delayed maturity of the corn and will result in a large percentage of it being used as silage. Surprisingly, this is the first time in the 14 years I have been at the Station that the majority of the corn planted has not reached physiological maturity. The soybeans planted in the research trials matured for the most part, with average or above yields being reported by John Wiersma, agronomist.

Ideal weather conditions and the superior varieties of wheat and barley developed by Drs. Rasmussen and Busch, Dept. of Agronomy, U of M, combined to set new field records at the Station. Three

fields of barley yielded over 100 bu/acre, with a top of 116.4 bu., with wheat running close to 80 bu/acre. At this writing, significant acres of these crops remain to be harvested to the north and east of us due to excessive rainfall.

Harry Burcalow, district program leader in agriculture for the Extension Service resigned earlier this summer to accept a position in Washington State. Barb Klix-bull, Northwest district director and district program leader for HE/FL, resigned to accept the position as secretary to the Board of Regents. Jared Smalley, area extension agent, Community and Natural Resource Development, joined the staff on August 1.

The plans for the new dairy research and teaching facility and the remodeling of the section of the current dairy barn built in 1964 are shaping up rapidly. If the current schedule can be maintained, construction on the new facility should commence on April 14, 1986. Those of us involved in the project wish to thank the many legislators and dairymen throughout the State who supported this request during the last legislative session.

Being accused of spending the whole summer fishing, I thought it only appropriate that I show a picture from the only day I was fishing, of the one that didn't get away.

Calendar of Events

Beef Cattlemen's Institute
October 24

Sheep Day
November 20

Beef Feeders Day
December 11

1986

Dairy Day
January 14

Sugarbeet Meeting
Grafton
January 28

Sugarbeet Meeting
Grand Forks
January 29

Red River Valley
Winter Shows
February 14-23

International Sugarbeet
Growers Institute &
Machinery Show
March 19 & 20

George and Leda Weiland show the retirement cake presented to them by the staff and co-workers at the recent party held in their honor.

George began his University career as a general mechanic on September 10, 1962. Promoted to an M & O Mechanic in 1968, George completed 23 years as a University of Minnesota employee.

Weiland was honored in 1980 when he was awarded the Northwest Experiment Station "Merit Award" for his many original mechanical contributions. George assembled an early three-wheeled lawn mower for the station from surplus parts. Not patented, it was still likely a "first" model. George also did combine alterations, constructed mechanized feed carts and mechanized handling devices to pull and carry one-ton silo unloaders.

George will pursue his hobbies of bow hunting and mechanical applications along with some travel during his retirement.

George Weiland Retires





How Cool Was 1985?

By Carlyle Holen, Area Extension Agent, CPM

While Tables 1 and 2 should not be compared directly because of differing beginning and ending dates, it is evident that 1985 is not the coolest season on record but at this date it is certainly below normal.

The cooler summer is also evident in the number of days during the summer with temperatures above 90°F., but this ranges from 0 in 1905 to 34 in 1939. In 1985 the Experiment Station only recorded two days over 90°F. and they occurred on May 4 and July 7.

I wondered if it would be possible to make up in September the heat not received in July and August. It's possible, but on average we accumulate only 10 GDD per day in September as compared to 17 and 18 GDD per day in July and

August. Therefore, approximately twice as long is needed in September to accumulate the same number of GDD as would occur in either July or August. As a result, our first killing frost would have to come no earlier than September 30 if we were going to accumulate the same number of GDD as a normal year, assuming we stop counting GDD on the date of our average first frost date of September 21. If corn was not planted until June 1 and missed the high temperatures in May, it would take approximately until October 10 before the number of GDD accumulated were equal to a September 21 ending date. This does not mean the corn would or would not be mature but only that the number of growing degree days between 1985 and a 30-year average would be the same.

The 1985 growing season was filled with surprises for anyone involved in crop production. Early in May, hot, dry weather pushed small grain development rapidly ahead and, by the end of the month, most of the Valley was two weeks ahead of a 30-year average in accumulated growing degree days (GDD).

It looked like a good year for row crops, but then came June, July and August with lower-than-normal temperatures. As of this writing (September 18), it appeared that only a late frost and an Indian summer would bring many row crops to maturity.

How Cool Was 1985?

Weather records are maintained by Russ Severson, associate scientist at the Northwest Experiment Station and date back to 1890. These records contain daily high and low temperature observations and can be used in calculations to make an estimate of the amount of heat available for plant growth. One estimate of available heat for plant growth is growing degree days and the calculation is simply the average daily temperature subtracted from some minimum temperature at which crop growth begins. The daily values can be summed for a cumulative value of heat produced during the year. Corn, for example, uses a minimum temperature of 50°F. and also uses a maximum temperature of 86°F. in the GDD calculation.

Table 1 presents the historical high and low cumulative GDD recorded over the past 95 years for corn and Table 2 lists the cumulative GDD for five locations in 1985.

Growing Degrees for Corn
Table 1. 1890-1985 Crookston Experiment Station

Seasonal extremes	Year	Accumulated ¹ GDD
high	1936	2677
low	1964	1685
average	—	2258

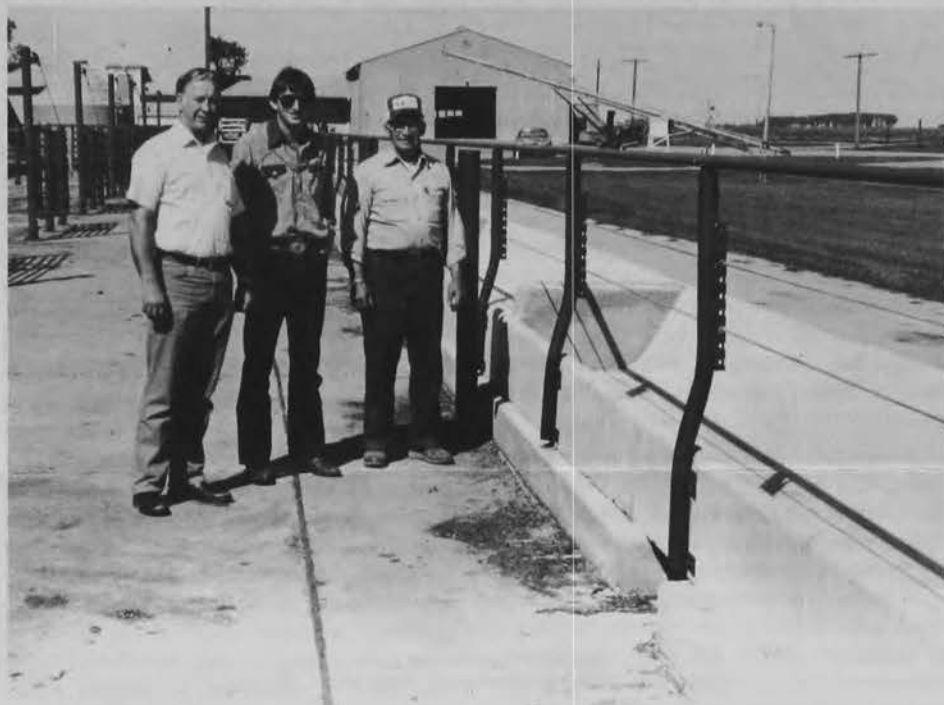
¹ Cumulative values for March 1-October 10

Table 2. 1985 Growing Degree Days for Corn

Location	Month	Monthly Accumulated GDD	30-year average	Departure from normal
Hallock	May	354	242	32% increase
	June	324	425	24% decrease
	July	535	575	7% decrease
	August	412	511	20% decrease
	Sept. 1-8	79	90	12% decrease
	Total	May 1-Sept. 8	1704	1843
Crookston	May	362	239	34% increase
	June	333	428	22% decrease
	July	539	577	7% decrease
	August	457	534	15% decrease
	Sept. 1-8	91	95	4% decrease
	Total	May 1-Sept. 8	1782	1873
Fargo	May	380	277	28% increase
	June	348	467	26% decrease
	July	574	642	11% decrease
	August	464	587	21% decrease
	Sept. 1-8	99	108	8% decrease
	Total	May 1-Sept. 8	1865	2081
Itasca	May	315	202	36% increase
	June	282	374	25% decrease
	July	488	524	7% decrease
	August	381	462	18% decrease
	Sept. 1-8	85	81	5% increase
	Total	May 1-Sept. 8	1551	1643
Browns Valley	May	422	276	35% increase
	June	412	482	15% decrease
	July	654	663	1% decrease
	August	513	611	16% decrease
	Sept. 1-8	141	115	19% increase
	Total	May 1-Sept. 8	2142	2147



New Feed Bunks Installed



Dr. Harvey Windels, animal scientist, Jeff Volesky, Jr. scientist, and Earl Carlson, maintenance foreman, of the Northwest Experiment Station view the new modern high-capacity concrete fenceline bunks with cable retainers which have replaced the obsolete wooden bunks in the eight-lot conventional beef barn.

The new bunks, with one continuous bunk per lot instead of the previous three sections per lot, will make feeding complete mixed rations with the mixer-feeder truck much easier and increase the efficiency of feeding the animals and cleaning the bunks.

These higher capacity bunks will also allow the accommodation of up to 30

head of large frame exotic cross calves per lot on high silage rations whereas with the old bunks, the upper limit in regard to bunk capacity, was about 20 head.

You are invited to visit anytime; however, you are especially invited to our Beef Feedlot Day on Wednesday, December 11, to see our new bunk system. One of the topics that will be reported on at Beef Day will be our trial on "Systems of Feeding Large Frame Calves", where a one-phase high-grain diet was compared to a two-phase (high roughage-high grain) system for performance and grade of steers. The 1985-86 beef trial will also be in progress pursuing another aspect of systems of feeding large frame calves.

Beef Cattlemen's Clinic

Beef Cattlemen's Clinic will be held Thursday, October 24, beginning at 4 p.m. in the Winter Shows building. The afternoon will feature a beef feeder calf demonstration showing pens of different types and crosses of northwestern Minnesota feeder calves. Central Livestock Association personnel and economist, Ken Egertson, will comment on the calves.

The evening speaker will be Dr. Gunther Rahnefeld from the Brandon Research Station - Agriculture Canada, Brandon, Manitoba. His topic will be, "Beef Cow Efficiency" and will cover 12 years of research on the comparison of several exotic x British breed cross cows versus Angus x Hereford cows in two different environments (range and Brandon) in respect to reproductive performance (calving ease and % calf crop), weaning weights, carcass data, post-weaning growth and cow winter maintenance.

Complete programs are in the mail. Plan now to attend the Beef Cattlemen's Clinic on October 24.

Sheep Day to Be Held

Sheep Day will be held at the Northwest Experiment Station on Wednesday, November 20. Plans for the program are almost complete and programs will be in the mail shortly.

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