What's Cropping Up?

A NEWSLETTER FOR NEW YORK FIELD CROPS & SOILS VOLUME 16, NUMBER 4, JULY-AUGUST, 2006

Using the Number of Growing Degree Days from the Tassel/Silking Date to Predict Corn Silage Harvest Date

W. J. Cox
Department of Crop & Soil Sciences
Cornell University

Temperature or accumulated growing degree days (GDD) strongly influences the growth and development of corn. Corn requires about 110-120 GDD to emerge under typical conditions, although deep planting or heavy residue increases the number of GDD for emergence. Likewise, 101-105 day hybrids require about 1300 GDD from emergence to silking, although hot and dry conditions in July will delay silking and thus increase the number of GDD, as it did in 2005 (Table 1). A challenge each year is to determine when to begin corn silage harvest. We estimated the number of GDD from the tassel/silking date to the silage harvest date, typically at 68-69% moisture in our corn silage hybrid trials, at the Aurora Research Farm in 2003, 2004, and 2005 to determine if the accumulated GDD between the two dates can predict when to begin corn silage harvest.

The number of calendar days between the tassel/silking date and the silage harvest date varied significantly across years (Table 1). In 2004, when drought did not occur, all hybrids, regardless of maturity group, were harvested 42 to 45 days after the tassel/silking date, very close to the typical 45 day interval often cited on when to begin corn silage harvest. In 2005, a year with significant drought, all hybrids were harvested only 31 to 35 days after the

Table 1. Tasseling/silking dates, silage harvest dates, and number of calendar and growing degree days (GDD) between the two dates for 96-100, 101-105, 106-110, and 111-115 day hybrids planted in late April of 2003, 2004, and 2005 at the Aurora Research Farm.

Hybrid Maturity Group Relative Maturity	Tassel/Silk	GDD °F	Silage Harvest Date	Days	GDD °F
			2003		
96-100	7/24	~1250	8/28	35	~775
101-105	7/27	~1300	9/5	40	~850
106-110	7/29	~1340	9/9	42	~850
111-115	7/31	~1380	9/11	43	~850
			2004		
96-100	7/20	~1250	8/31	42	~725
101-105	7/22	~1300	9/3	43	~750
106-110	7/23	~1330	9/5	44	~775
111-115	7/24	~1350	9/7	45	~800
			2005		
96-100	7/17	~1285	8/18	31	~780
101-105	7/19	~1330	8/22	34	~815
106-110	7/21	~1370	8/25	35	~810
111-115	7/22	~1405	8/26	35	~810

Crop Management

tassel/silking date. Obviously, the use of calendar days after the silking date is not a good predictor on when to begin corn silage harvest in droughty years.

The number of GDD from the tassel/silking date to the silage harvest date varied modestly between influence the degree of rehydration of corn, which influences the silage harvest date. Overall, however, the 96-100 day hybrids required about 750 and the 101-105, 106-110, and 111-115 day hybrids required about 800 GDD from the tassel/silking date until the beginning of corn silage harvest.

Table 2. Monthly growing degree days (GDD, 86-50°F system) and precipitation at the Aurora Research Farm during the 2003, 2004, and 2005 growing seasons.

	2003		2004		2005	
Month	GDD	Precip.	GDD	Precip.	GDD	Precip.
May	251	4.34	408	6.82	233	1.00
June	458	3.14	449	1.75	654	4.33
July	642	5.68	609	5.47	734	2.05
August*	678	1.65	563	5.55	716	2.24*
	2029	14.81	2029	19.59		

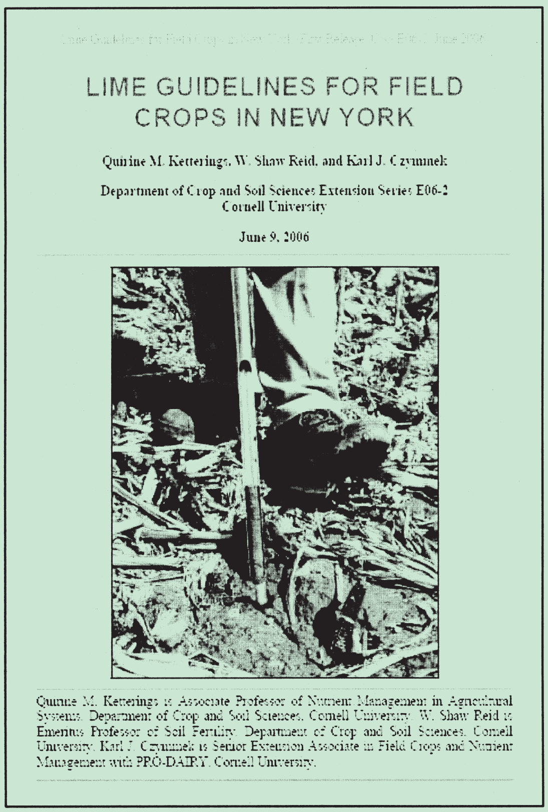
*From August 1st through August 26th, the date of harvest of the 111-115 day hybrids.

years for each hybrid group (Table 1). In 2003 and 2005, the 96-100 day hybrids required about 775 GDD from the tassel/silking date to the silage harvest date compared with only 725 GDD in 2004. The 101-105, 106-110, and 111-115 day hybrids required about 850 GDD from the tassel/silking date until the silage harvest date in 2003 but only 750 to about 800 GDD in 2004 and 2005. August of 2003 was dry (1.65 inches of precipitation) and hot (678 GDD) so the corn was somewhat drought-stressed in late August (Table 2). About 2 inches of precipitation occurred on August 31-September 1, which resulted in significant rehydration of corn, so the harvest of the 101-105, 106-110, and 111-115 day hybrids were delayed a few days until moistures got back down to below 70%. Consequently, there were 50 more GDD between the tassel/silking date and the corn silage harvest date in 2003. August of 2004 was cool (563 GDD) and wet (5.55 inches of precipitation) so the corn was not drought-stressed. The 3 inches of precipitation that occurred on August 28th did not result in rehydration as indicated by whole plant moistures of 68% for the 96-100 day hybrids on August 31st. Apparently, antecedent soil moisture and corn conditions (i.e. drought-stressed) Predicting corn silage harvest, based on GDD from the tassel/silking date to the silage harvest date, is not perfect because other environmental factors can also influence when corn silage harvest begins. Nevertheless, the use of accumulated GDD from the tassel/silking date can be used as a guide on when to begin corn silage harvest. We will be ready to begin harvest of our 96-100 day hybrids at about 750 GDD after the silking date and our 101-105, 106-110, and 111-115 day hybrids at about 800 GDD after the silking date. In some years, we may be right at 68% moisture and can begin that day. In other years, we may have to wait a couple of days, especially if rehydration of the corn hybrids occurred because of significant precipitation after an extended dry period. If you wish to use accumulated GDD after the tassel/ silking date as a guide on when to begin corn silage harvest, we urge you not to use the GDD data from big-city weather stations such as Buffalo, Rochester, Syracuse, Utica, Albany, etc, Instead, use weather stations from more rural locations such as Dansville, Batavia, Geneva, Aurora, Canton, Chazy, etc, because the number of GDD from those weather stations would more accurately mimic the actual GDD accumulated in nearby corn fields.

Lime Guidelines for Field Crops in New York

Quirine Ketterings, W. Shaw Reid, and Karl J. Czymmek

Achieving optimum pH is essential for field crop production because soil pH affects many soil properties and processes including nutrient cycling, soil microbial activity and soil structure. The native pH of a soil is determined by the type(s) of rock, or parent material, the soil was developed from. The characteristics of the parent material influence soil mineralogy and the quantity of exchangeable cations that determine soil pH. Most agricultural soils in New York are acidic and have a pH ranging from 4.5-7.0. Some New York soils are "calcareous", meaning they contain free calcium carbonate, or lime deposits in the surface layer. Calcareous soils tend to have a pH in the range of 7.0-8.5 and the pH tends to be quite stable, so pH management is usually not an issue. However, naturally acidic agricultural soils need to be monitored for pH and lime will need to be applied for optimum field crop production.



LIME GUIDELINES FOR FIELD CROPS IN NEW YORK

Quirine M. Ketterings, W. Shaw Reid, and Karl J. Czymmek

Department of Crop and Soil Sciences Extension Series E06-2
Cornell University

June 9, 2006

Quirine M. Ketterings is Associate Professor of Nutrient Management in Agricultural Systems, Department of Crop and Soil Sciences, Cornell University. W. Shaw Reid is Emeritus Professor of Soil Fertility, Department of Crop and Soil Sciences, Cornell University. Karl J. Czymmek is Senior Extension Associate in Field Crops and Nutrient Management with PRO-DAIRY, Cornell University.

In this extension bulletin we give background information on pH and acidity (Section 2), describe soil sampling procedures (Section 3) and analytical tests for pH and acidity (Section 4), outline how a lime recommendation can be derived based on soil properties and crop pH requirements (Section 5), briefly describe what can be done to lower the pH (Section 6), list and describe different liming materials (Section 7), state minimum quality guarantees for lime materials sold in New York (Section 8), and outline considerations for lime application (Section 9).

Downloadable from the Cornell University Nutrient Management Spear Program (NMPS) website for field crops nutrient guidelines:

http://nmsp.css.cornell.edu/nutrient_guidelines/

Also available: Nitrogen, phosphorus and potassium guidelines for field crops in New York.

Weed Management

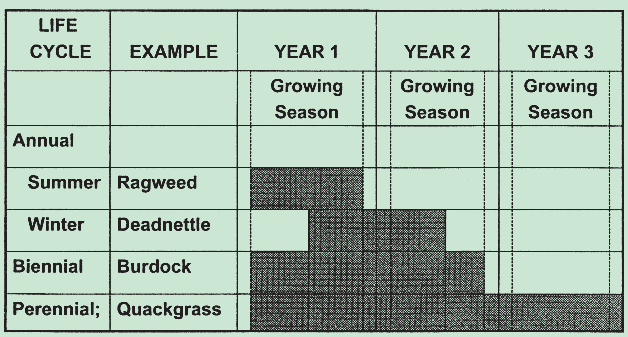
Tillage Systems Affect Types of Weeds in Summer Annual Crops

Russell R. Hahn
Department of Crop and Soil Sciences
Cornell University

Field crop producers recognize that weeds exhibit different life cycles and that the choice of crop influences the types of weeds in a field. For example, summer annual weeds, like ragweed and large crabgrass, are commonly found in summer annual crops like corn and soybeans. What is sometimes forgotten is that the tillage system also affects the type of weeds in a field. A review of weed life cycles will help understand how the tillage system influences weed populations.

Life Cycles

Figure 1. Weed Life Cycles



Weeds are classified as annual (summer or winter), biennial, or perennial (Figure 1). Although some weeds may exhibit two or more different life cycles. **Annual** weeds reproduce and spread by seed only and complete their life cycle within a year. Seed of summer annual weeds germinate in spring or summer and produce seed that same growing season. Seed of winter annuals germinate in late summer or fall and overwinter in a vegetative state. They flower and set seed early in the next growing season. **Biennial** weeds also reproduce by seed only and take two years to complete their life cycle. Seed of biennials germinate in the spring or early summer of the first growing season and then flower and set seed during the second growing season. Common burdock and bull thistle exhibit this life cycle. Finally, **perennial** weeds are those that live for more than two years like quackgrass and common milkweed. While annual and biennial weeds reproduce and spread by seed only, many perennial weeds spread by seed as was by vegetative reproductive structures such as rhizomes (underground stems). Perennial weeds can be grouped as shown in Figure 2 according to the way(s) they reproduce and spread.

Although simple perennials, like dandelion, may live for many years, they only reproduce and spread by forming seed. Each of the other perennial types reproduce by seed and by some type of vegetative reproductive structure. In the case of wild garlic, aerial and underground bulblets serve as a means of spread; for yellow nutsedge, the nutlike tubers are the major means of reproduction, and for many creeping perennials, the rhizomes or underground stems allow these weeds to spread.

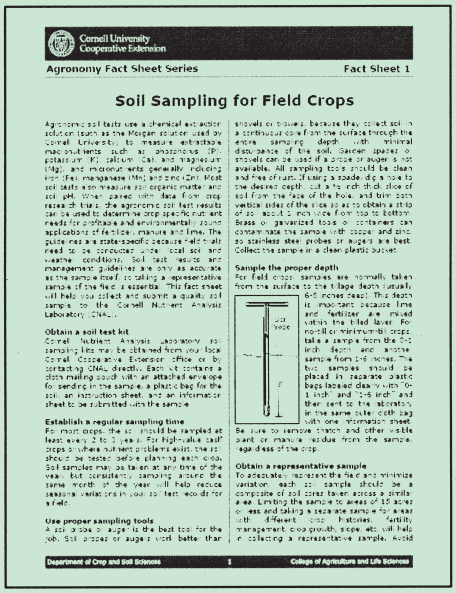
Effect of Tillage Systems

In conventionally tilled summer annual crops, like corn and soybeans, most weeds are either summer annuals or perennials that have vegetative reproductive structures. Winter annuals, biennial, and simple perennials do not survive in fields that are plowed and fitted prior to planting summer annual crops. When tillage is eliminated in zone/no-tillage cropping systems, winter annual, biennial, and simple perennial weeds can become problematic. Weeds that can become a problem in no-tillage fields include common chickweed, purple deadnettle, horseweed, and dandelion. To manage these weeds, fall herbicide applications or burndown applications of non-selective herbicides may be needed at planting. **Growers must recognize that changes in tillage will cause changes in weed populations and that weed management practices must be adjusted accordingly.**

Figure 2. Perennial Plant Forms

Form	Example
Simple	Dandelion
Bulbous	Wild Garlic
Tuberous	Yellow Nutsedge
Creeping	
Shallow	Quackgrass
Deep	Milkweed

Agronomy Fact Sheet Series


Cornell University Cooperative Extension

Agronomy Fact Sheet Series — Fact Sheet 1

Soil Sampling for Field Crops

Obtain a soil test kit

Establish a regular sampling time

Use proper sampling tools

Sample the proper depth

Obtain a representative sample

Department of Crop and Soil Sciences — 1 — College of Agriculture and Life Sciences

Agronomy Fact Sheet Series

The first two fact sheets were developed by Cornell undergraduate students working with Nutrient Management Spear Program staff and Cornell Cooperative Extension educators. This fact sheet series is a joint project of Cornell University Extension Faculty, Cornell Cooperative Extension field crops educators, Soil and Water Conservation District staff, and Cornell undergraduate and graduate students with an interest in agricultural extension.

Currently available:

Agronomy Fact Sheet # 1: Soil Sampling for Field Crops (6/3/2005)
Agronomy Fact Sheet # 2: Nitrogen Basics - The Nitrogen Cycle (6/3/2005)
Agronomy Fact Sheet # 3: Pre-Sidedress Nitrate Test (9/20/2005)
Agronomy Fact Sheet # 4: Nitrogen Credits from Manure (8/19/2005)
Agronomy Fact Sheet # 5: Soil pH for Field Crops (11/11/2005)
Agronomy Fact Sheet # 6: Lime Recommendations (3/4/2006)
Agronomy Fact Sheet # 7: Liming Materials (7/21/2006)
Agronomy Fact Sheet # 8: Starter Phosphorus Fertilizer for Corn (10/22/2005)
Agronomy Fact Sheet # 9: Cornell Cropware (8/18/2005)
Agronomy Fact Sheet # 10: Phosphorus Index (12/12/2005)
Agronomy Fact Sheet # 11: Nitrogen Leaching Index (2/2/2006)
Agronomy Fact Sheet # 12: Phosphorus Basics - The Phosphorus Cycle (1/16/2006)
Agronomy Fact Sheet # 13: Phosphorus Runoff (1/16/2006)
Agronomy Fact Sheet # 14: Brown Midrib Sorghum Sudangrass, Part 1 (11/23/2005)
Agronomy Fact Sheet # 15: Soil Test Phosphorus Conversions (coming soon)
Agronomy Fact Sheet # 16: Fertilizers - The Basics (coming soon)
Agronomy Fact Sheet # 17: Nutrient Management for Pastures (6/28/2006)
Agronomy Fact Sheet # 18: Manure Spreader Calibrations (coming soon)
Agronomy Fact Sheet # 19: Soil Management Groups (6/13/2006)

More to come….

Downloadable from the Nutrient Management Spear Program publication website:

http://nmsp.css.cornell.edu/publications/factsheets.asp

Crop Management

How Late Can You Plant Winter Wheat in New York?

Bill Cox and Phil Atkins
Department of Crop and Soil Sciences
Cornell University

Because of the dramatic increase in soybean acreage in New York (around 200,000 acres annually), a significant portion of the wheat acreage now follows soybeans in the rotation. The 2004 growing season was quite cool so many soybean fields were not ready for harvest until late October. In 2005, October was excessively wet so many growers were unable to harvest soybeans until late October or early November. Many farmers opted not to plant winter wheat after soybeans in either year because of potential negative effects of the late planting date.

We decided to compare winter wheat at a typical planting date (September 21) and a late planting date (October 29) in 2004 to determine the yield reduction with a 5 to 6- week planting delay. We planted Caledonia soft white winter wheat at four seeding rates (1.5, 2.0, 2.5, and 3.0 bu/acre) on the two dates to also see if an increased seeding rate (beyond the recommended 2.0 bu/acre) can ameliorate some of the negative effects of a delayed planting date. Surprisingly, yields did not differ between the two planting dates in the 2004-2005 growing season with both dates yielding about 59 bu/acre (Table 1). Also, wheat yielded best at the 2.0 bu/acre seeding rate, regardless of planting date in the 2004-2005 growing season. We repeated this study in the 2005-2006 growing season with seeding rates of 1.0, 1.5, 2.0, 2.5, and

Table 1. Grain yield and test weight of Caledonia soft white winter wheat planted on 21 September and 29 October 2004 at 1.5, 2.0, 2.5, and 3.0 bu/acre seeding rates at the Aurora Research Farm.

	PLANTING DATE	
Seeding Rate	September 21	October 29
Bu/acre	----Yield (bu/acre)----	
1.5	58	57
2.0	62	62
2.5	59	59
3.0	58	62
LSD 0.05†	NS	
	----Test Weight (lbs/bu)----	
1.5	58	59
2.0	57	60
2.5	57	59
3.0	57	60
LSD 0.05†	0.5	

†LSD 0.05 compares means between planting dates.

Table 2. Average temperature and monthly precipitation at the Aurora Research Farm during the 2004-2005 and 2005-2006 wheat growing seasons.

	TEMPERATURE			PRECIPITATION		
Month	2004-2005	2005-2006	30-yr mean	2004-2005	2005-2006	30-yr mean
		°F			in.	
September	65.0	66.2	62.1	4.13	3.50	4.21
October	51.3	52.1	50.9	2.57	6.80	3.20
November	42.1	45.0	40.4	2.28	4.42	3.36
December	30.1	27.5	29.7	2.48	1.80	2.45
January	21.9	34.0	23.7	3.23	2.75	1.92
February	27.1	28.5	25.1	1.42	1.17	1.88
March	30.3	33.7	33.8	2.03	1.55	2.50
April	48.1	47.2	45.3	4.85	2.25	3.28
May	53.5	58.0	57.6	1.00	3.94	3.17
June	72.5	67.0	66.7	4.33	6.25	4.09

3.0 bu/acre at a typical planting date (Sept.14) and a late planting date (Nov.4).

The 2005-2006 wheat growing season was atypical because of excessively mild temperatures in the fall and winter (Table 2). Also, the last week of May and all of June were excessively wet, which resulted in significant scab damage in central New York. Visual symptoms of scab damage were more prevalent in the late-planted wheat in our study because of the delayed anthesis date, which corresponded with continuously wet conditions during early June.

Yields differed between planting dates in the 2005-2006 growing season with the Sept. 14th planting date yielding 22% higher at 59 bu/acre compared with 46 bu/acre for the Nov.4th planting date (Table 3). A planting date x seeding rate interaction once again did not occur, with the 2.0 bu/acre seeding rate yielding best at both planting dates (Table 3). Straw yields also yielded 29% higher at the Sept.14th planting date with straw yields of 2.36 tons/acre compared with 1.69 tons/acre for the Nov.4th planting date. Surprisingly, straw yields showed less of a yield response to seeding rates with maximum straw yields at the 1.5 bu/acre seeding rate, regardless of planting date (Table 3).

Wheat apparently can be planted in late October or early November in central New York with some success, but a yield penalty as high as 22% for grain yield and 29% for straw yield occurred in one of the two years of study. The recommended 2.0 bu/acre seeding rate provided optimum yield at the late October or early November planting date so higher seeding rates may not ameliorate the potential yield penalty for a late planting date. More surprising, straw yields showed less of a yield response to seeding rates with the 1.5 bu/acre seeding rate resulting in maximum straw yields at both planting dates. We will complete this study in the 2006-2007 growing season and update our planting date and seeding rate recommendations based on three years of data from this study.

Table 3. Grain yield and straw yield of Caledonia soft white winter wheat planted on 15 September and 4 November 2005 at 1.0, 1.5, 2.0, 2.5, and 3.0 bu/acre seeding rates at the Aurora Research Farm.

	PLANTING DATE	
Seeding Rate	September 14	November 4
Bu/acre	---------------------Grain Yield (bu/acre)------------------------	
1.0	52	42
1.5	59	44
2.0	64	47
2.5	60	47
3.0	60	49
Mean	59	46
LSD 0.05†	4.5	
	--------------------Straw Yield (Tons/Acre)---------------------	
1.0	2.2	1.5
1.5	2.4	1.8
2.0	2.5	1.6
2.5	2.4	1.6
3.0	2.4	1.8
Mean	2.36	1.67
LSD 0.05†	0.26	

†LSD 0.05 compares means between planting dates.

Calendar of Events

August 29, 2006	11th Annual Northeast Buckwheat Field Day, Veg. Res. Farm, Geneva Exp. Station
Oct. 24, 2006	Field Crop Dealer Meeting, Comfort Suites, 7 Northside Drive, Clifton Park, NY
Oct. 25, 2006	Field Crop Dealer Meeting, Holiday Inn, 1777 Burrstone Road, New Hartford, NY
Oct. 26, 2006	Field Crop Dealer Meeting, Batavia Party House, 5762 East Main Road, Batavia, NY
Oct. 27, 2006	Field Crop Dealer Meeting, Auburn Holiday Inn, 75 North Street, Auburn, NY
Nov. 7-9, 2006	NE Division of the American Phytopathological Society, Burlington, VT
Nov. 12-16, 2006	American Society of Agronomy Meetings, Indianapolis, IN
Nov. 29-Dec.1, 2006	National Soybean Rust Symposium, St. Louis, MO
Dec. 5-7, 2006	NE Region Certified Crop Advisor Conference
Dec. 10-12, 2006	National Fusarium Head Blight Forum, Raleigh, NC

What's Cropping Up? is a bimonthly newsletter distributed by the Crop and Soil Sciences Department at Cornell University. The purpose of the newsletter is to provide timely information on field crop production and environmental issues as it relates to New York agriculture. Articles are regularly contributed by the following Departments at Cornell University: Crop and Soil Sciences, Plant Breeding, Plant Pathology, and Entomology. **To get on the mailing list, send your name and address to Pam Kline, 234 Emerson Hall, Cornell University, Ithaca, NY 14853.**

Cornell University
Cooperative Extension

Dept. of Crop and Soil Sciences
234 Emerson Hall
Cornell University
Ithaca, NY 14853

Helping You Put Knowledge to Work