What's Cropping Up?

A NEWSLETTER FOR NEW YORK FIELD CROPS & SOILS VOLUME 14, NUMBER 1, JANUARY-FEBRUARY, 2004

PHOSPHORUS STARTER PROJECT - RESULTS OF THE 2003 GROWING SEASON

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2003 Participating Producers:

Ashland Dairy (Poplar Ridge), Bill Brown (Hammondsport), Ken Burr (Trumansburg), Tim Cantwell (Richfield Springs), Dudley French (Waverly), Gary Gaige (Alpine), Greenwich Central School/William Elsworth (Greenwich), Mark Grocott (Edmeston), Harvest Dairy Farm (Madrid), Tim and Mark Heiden (Madrid), Willy Hughson (Jeffersonville), Bill Kilcer (Genoa), Frank Lamport (Hobart), Maxwell Farms (Geneseo), Kevin McCollum (Canton), Mike McMahon (Homer), Tom and Mike Moskin (Ava), Steve Nemec (New Hope), Dave Schieferstine (Rome), Sykes Farm (North Branch), John Williams (Carthage), Rob Williams (Waterville), and Marty Young (Cuyler).

2003 Participating CCE Educators:

Carl Albers (Steuben Co), Peter Barney (St. Lawrence Co), Shawn Bossard (Cayuga Co), Peter Carey (Sullivan Co), Janice Degni (CCTTS Area Extension Specialist), Dale Dewing (Delaware Co), Aaron Gabriel (Washington Co), Kevin Ganoe (Mohawk Region Area Extension Specialist), Mike Hunter (Jefferson Co), Jeff Miller (Oneida Co), Mike Stanyard and Nancy Glazier (North West New York Dairy, Livestock and Field Crops Team).

Other 2003 Participants:

Elaine Dalrymple (Schuyler Co. Soil and Water Conservation District), Ev Thomas (Miner Institute), Mike Davis (Willsboro Research Farm), and Dr. Adam Khan (Morrisville Technical College).

2003 Sponsors:

NE SARE (project funding), Carovail (fertilizer), Northern NY Agriculture Development Program (Willsboro Research Farm support), Pioneer Hi-Bred International Inc. (seed), and AgriCulver Seeds (gift certificates for drawings at Starter P booth, Empire Farm Days).

Background and Summary of 2000-2002 Results

The NY starter phosphorus (P) project was initiated in 2000 to evaluate and demonstrate the value of P starter applications for corn on soils testing high or very high in P (e"9 lbs P/acre on the Cornell Morgan test). With support from USDA-NRCS, a grant from the NE SARE program, fertilizer donations from Agway and Carovail, seed donations from Pioneer Hi-Bred International Inc., and NNYADP support for the Willsboro Research Farm, 43 on-farm trials and 9 research

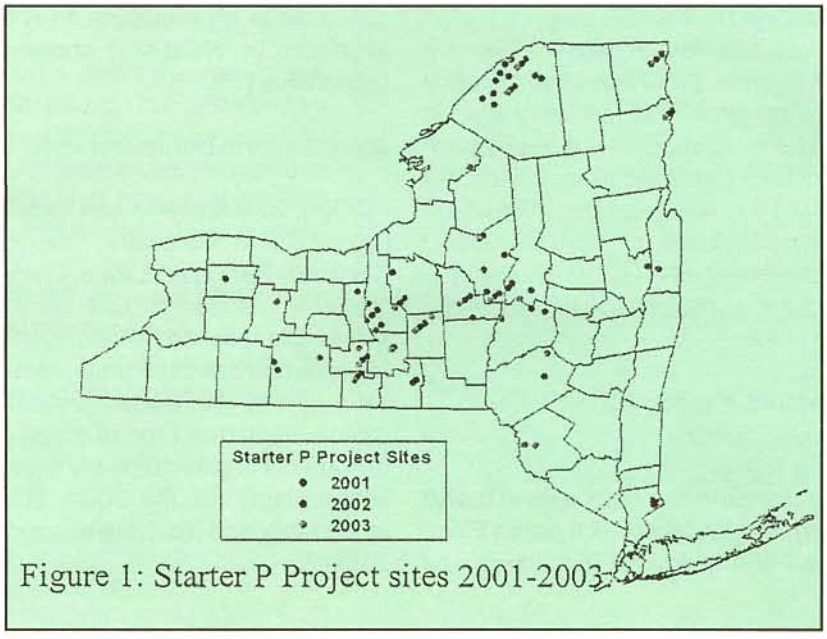

Figure 1: Starter P Project sites 2001-2003

station trials were conducted in 2001-2002. In the on-farm trials we tested the need for starter phosphorus fertilizer on soil with high or very high soil test P (STP) levels using comparisons of: (1) no starter, (2) no P_2O_5 in the starter, (3) 10-25 lbs of P_2O_5 in the starter, and (4) >25 lbs P_2O_5. On the research stations we tested: (1) no starter, (2) 200 lbs/acre of 10-0-10 (no P_2O_5), (3) 200 lbs of 10-10-10 (20 lbs P_2O_5), and (4) 200 lbs of 10-20-10 (40 lbs P_2O_5). On average, corn grain and silage yields showed no response to P additions in starter fertilizer. Following the 2002 season, we continued to recommend the application of N in the starter band, regardless of soil test P level, especially when planting occurs early in the season on fields without a recent manure history. We concluded that on sites testing *high* in P, no yield penalty is expected when P starter levels are *reduced* below 25 lbs P_2O_5/acre. When manure is applied to high testing sites or on sites that test *very high* in phosphorus, there is a low probability of a starter P response and P could be *eliminated* from the starter without a yield penalty. The results of the 2001-2002 seasons were reported in earlier issues of "What's Cropping Up?" and are downloadable from the NY Starter Phosphorus Project website: http://nmsp.css.cornell.edu/projects/starterp.asp.

2003 Results of Replicated Research Trials (experimental stations)

In 2003, trials were established in four replicates at the Mt Pleasant Farm (Mardin), the Willsboro Research Farm (Cosad), the Musgrave Farm at Aurora (Kendaia), and Morrisville Technical College (Palmyra). The fertilizer blends were composed of urea, monoammonium phosphate (MAP) and potash. The results of the research farm trials are shown in Table 1.

There were no significant yield differences due to P applications at any of the locations. At the site in Morrisville, the corn grew as well without N application as it did with 20 lbs of starter N and 100 lbs of sidedress N. The latter is not surprising as the site has very high fertility levels due to a long history of manure applications. Starter N+K increased yields in Willsboro while an additional comparison of corn yields without any starter or sidedress N application (12.3 tons/acre in Mt Pleasant, 11.6 tons/acre in Aurora, 9.6 tons/acre in Willsboro) showed all three sites to be responsive to N.

Table 1: Silage yields (tons/acre 35% DM). All plots were sidedressed with 100 lbs N/acre.

Location	STP	P rec.*	No Starter	200 lbs 10-0-10	200 lbs 10-10-10	200 lbs 10-20-10
Mt Pleasant	7	30	18.5 a	18.8 a	19.0 a	17.9 a
Aurora	8	25	20.2 a	20.7 a	21.1 a	20.8 a
Willsboro	19	20	9.4 b	14.6 a	17.0 a	14.6 a
Morrisville	104	0	17.1 a	16.4 a	17.4 a	16.4 a
All	-	-	16.3 a	17.7 a	18.6 a	17.4 a

* Cornell phosphorus guidelines for corn in lbs P_2O_5 per acre.

Note: Average values within rows with different letters (a or b) are statistically different (α=0.05).

2003 On-farm Demonstration Trials

In 2003, 22 trials were conducted by 12 cooperators and producers in Delaware, Cayuga, Chemung, Clinton, Cortland, Herkimer, Lewis, Livingston, Oneida, Otsego, Schuyler, Steuben, St. Lawrence, Sullivan, Tompkins, and Washington counties (see Figure 1). One trial was harvested for grain corn; all other trials were harvested for silage. For the grain trial, yields were converted to a silage equivalent by assuming that 1 ton of silage (35% dry matter) equals 5.9 bu/acre of grain (85% dry matter). Treatment means for silage yields for the 2001, 2002, and 2003 seasons individually and the three seasons combined are given in Table 2.

The 2003 results suggest a response to a small amount of starter P (<25 lbs P_2O_5/acre). No additional yield was obtained with higher amounts. The combined 3-year average allowed us to check if responses to banded P were different with early planting versus late planting, with soils testing high in P versus very high, and on manured fields versus fields that had not received manure in recent history. The soil test classification (high or very high) impacted the results; for fields testing high in P, an increase in yield was seen with a modest P application (<25 lbs P_2O_5/acre) while for fields that were very high in P, yields responded to starter N(+K) only (Table 2).

Nutrient Management Spear Program
http://nmsp.css.cornell.edu/

A collaboration among the Department of Crop and Soil Sciences, Pro-Dairy, and Cornell Cooperative Extension.

Table 2: Silage yields (tons/acre 35% dry matter) for on-farm trials conducted in 2001-2003.

	2001 (27 trials)	2002 (16 trials)	2003 (22 trials)	3-Year Average	
				High P	Very High P
No starter	16.7 b	15.7 a	20.6 b	17.7 b	19.5 b
N(+K) only	19.3 a	16.2 a	20.7 b	17.9 b	20.6 ab
N(+K) + 10-25 lbs P_2O_5/acre	19.9 a	16.5 a	21.7 a	19.2 a	21.4 a
N(+K) + >25 lbs P_2O_5/acre	19.8 a	16.0 a	21.1 ab	18.2 ab	21.2 a

Note: Average values within columns with different letters (a or b) are statistically different (α=0.05).

Conclusions

Based on the results of the past three years, we conclude that on sites that test *high* in P and have no manure applications planned for the season, no yield penalty is expected when P starter levels are *reduced* below 25 lbs P_2O_5/acre. On sites that test *very high* in P *or* when manure is applied to high testing sites, there is a low probability of a starter P response and P could be *eliminated* from the starter without a yield penalty. Corn responds to N in the starter band more often than P and we continue to recommend 20-30 lbs of banded starter N, even where P is eliminated (Table 3).

Table 3: Phosphorus guidelines for corn in New York.

	Lbs P_2O_5/acre	
Soil Test P	With manure	No manure
Very Low	20-30	60-70*
Low	20-30	50-60*
Medium	20-30	25-50*
High	0	0-25
Very High	0	0

* Put ~25 lbs P_2O_5/acre in the starter fertilizer band; balance may be included in the band or broadcast.

Crop Management

Recommended Roundup Ready Soybean Varieties

Bill Cox, Dept. of Crop & Soil Sciences, Cornell University

The cost of soybean seed continues to increase so soybean variety selection has increased in importance. Now more than ever soybean growers should carefully select the best varieties for their farms. We evaluated Group I and Group II Roundup Ready soybean varieties at the Aurora Research Farm in Cayuga Co. and on a grower's field in Livingston Co. in western NY in 2002 and 2003. We evaluated Group 0 and Group I varieties at the Miner Institute in Clinton Co. and on a grower's field in Jefferson and/or Clinton Co. in 2002 and 2003. Tables 1 and 2 list the recommended soybean varieties in New York, based on variety tests over the last few years. We recommend varieties that have relative yields of 100% or greater (100% equals the mean of the tests). We suggest that you place more importance on the varieties that have been entered in the tests for 2 or more years because these varieties have performed well over more environment.

Table 1. Relative yields of recommended soybean varieties for central and western New York, based on tests at Aurora and in Livingston Co.

VARIETY	COMPANY	RELATIVE YIELD (%)	YEARS IN TEST
		GROUP I	
S1918-4	Stine	109	2
SG1919	Seedway	105	1
S1613-4	Stine	100	2
S19-V2	NK	100	1
		GROUP II	
AG2105	Asgrow	115	2
AG2703	Asgrow	109	1
DKB23-51	DeKalb	109	1
AG2705	Asgrow	107	2
S2640-4	Stine	106	1
S24-K4	NK	105	3
SG2405	Seedway	101	1

Central/Western NY

S1918-4 from Stine has performed well in the Group I tests over the last two years (Table 1). SG1919 from Seedway also yielded very well in the Group I test in 2003. Both are late Group I varieties that have matured in mid to late-September and have been ready for harvest in early October.

AG2105 from Asgrow has performed exceptionally well in the Group II tests over the last couple of years (Table 1). AG2105 is an early Group II variety so it has also matured in mid to late-September and has been ready for harvest in early October. AG2703 from Asgrow and DKB23-51 from DeKalb yielded well in our 2003 tests as did S2640-4 from Stine. AG2705 from Asgrow has yielded well over the last 2 years. S24-K4 from NK, however, has shown the most yield stability of all varieties by yielding well at both locations over the last 3 years.

Northern NY

RR Razor from Hyland and AG0801 from Asgrow yielded well in the Group 0 test in 2003 with both varieties yielding between 70 and 75 bu/acre at both locations (Table 2). S1918-4 and S1613-4 from Stine have yielded well in the Group I tests over the last 2 years, but especially in 2003, when both varieties averaged about 80 bu/acre across the two sites.

Conclusion

Soybean growers need to get it right on variety selection because seed costs are the major input cost for producing soybeans. Our recommended varieties have performed well under NY growing conditions, especially those varieties that have been entered in the tests for more than 1 year. Correct variety selection for your farm can result in $20 to $40/acre more profit, depending upon the price of soybeans.

Table 2. Relative yields of recommended soybean varieties for northern New York, based on tests at Miner Institute and in Jefferson or Clinton Co.

VARIETY	COMPANY	RELATIVE YIELD (%)	YEARS IN TEST
		GROUP 0	
RR Razor	Hyland	102	1
AG0801	Asgrow	101	1
		GROUP I	
S1918-4	Stine	106	2
S1613-4	Stine	102	2

Welcome Renuka Rao, Director, Cornell Nutrient Analysis Laboratory (CNAL), Department of Crop and Soil Sciences and the ICP Laboratory, Department of Horticulture.

Welcome

RENUKA RAO

In October 2003, Dr. Renuka Rao joined Cornell University as the Director of the Cornell Nutrient Analysis Laboratory (CNAL) in the Department of Crop and Soil Sciences and the ICP Laboratory in the Department of Horticulture. Following the recommendation of the external review of the laboratories in the spring of 2003, both analytical facilities will merge into one facility by July 2004 to serve faculty, staff, students and New York stakeholders with high quality soil, plant and environmental analyses and research-based soil fertility recommendations.

Renuka is originally from Hyderabad, India, the fifth largest metropolis of India. She completed her B.S. (Agricultural Science) and M.S. (Soil Science and Agricultural Chemistry) at Andhra Pradesh Agricultural University in Hyderabad. During her masters program she worked on soil test-crop response correlation studies. She received her Ph.D. in Soil Science, specializing in soil fertility and chemistry, from Texas A&M University, College Station, Texas. There, her research involved laboratory and field evaluation and calibration of various lime requirement methods and modification of methods for deriving an accurate, rapid, and economic lime recommendation method for adoption by the state soil-testing laboratory.

Prior to her arrival at Cornell, Renuka worked as a Senior Chemist at the Tropical Research and Education Center (TREC), University of Florida, Homestead, FL, where she managed various projects in areas of plant nutrition, soil fertility and water quality in association with extension agents, nursery (ornamental) growers, and fruit and vegetable growers and was the manager of the Analytical Research Laboratory.

After her first months at Cornell she remarks: "I have a wonderful team of well trained and experienced analysts to help me in my efforts to merge the two labs (CNAL and the Horticulture ICP lab) both programmatically and physically to better meet the research, teaching and extension missions of the University. I am looking forward to working with all of you and providing you our services".

Renuka can be reached at (607) 255-1722 or by email at: rbr25@cornell.edu.

We are all very happy to have Renuka on board!

Weed Management

Perennial Forage Grasses Suppress Roughstalk Bluegrass in Alfalfa/Grass Seedings

Russell R. Hahn and Paul J. Stachowski
Department of Crop and Soil Sciences, Cornell University

Roughstalk bluegrass (*Pao trivialis* L.) Is a perennial cool season grass that heads in May and early June and then goes dormant in summer. This weedy grass is a problem in perennial forage seedings because it matures prior to first cutting harvest and the mature, somewhat woody stems reduce the palatability and quality of first cutting dry hay. It's presence in alfalfa that is harvested and preserved as haylage is perhaps of less concern than in dry hay.

The majority of alfalfa seedings in NY State include a perennial forage grass, most often timothy, because clear-seeded alfalfa does not persist well on moderately to poorly drained soils that are common in NY. Select (clethodim), a postemergence grass herbicide will control this weedy grass in clear-seeded alfalfa. Unfortunately, Select also controls desirable perennial grasses in mixed seedings. Observations indicate that bluegrass is less of a problem in mixed alfalfa/grass seedings than in clear-seeded alfalfa. A research/demonstration project, supported by the NYS IPM Grants Program, was conducted to document the value of using recommended and double seeding rates of timothy or orchardgrass for suppressing roughstalk bluegrass in alfalfa/grass seedings.

Experiment Established

A field experiment was established near Ithaca on April 30, 2001. Alfalfa 'Pioneer 5347 LH', timothy 'Mariposa', and orchardgrass 'Shawnee' were the varieties used for this experiment. The entire plot area was seeded with alfalfa at the rate of 12 lb/A. Selected plots were then over-seeded with either 5 or 10 lb/A of timothy or orchardgrass. An untreated check and a chemical control treatment were included. A list of treatments follows:

1. Alfalfa as an untreated check
2. Alfalfa with Select herbicide
3. Alfalfa + timothy at 5 lb/A
4. Alfalfa + timothy at 10 lb/A
5. Alfalfa + orchardgrass at 5 lb/IA
6. Alfalfa + orchardgrass at 10 lb/A

The entire plot area was sprayed with 2 qt/A of Butyrac 200 (2,4-DB) on June 25, 2001 to control annual broadleaf weeds. Bluegrass became established in the fall of the seeding year (2001). On April 16, 2002 and on May 9, 2003 the entire plot area was again sprayed with 2 qt/A of Butyrac 200. In addition, 12 fluid oz/A of Select herbicide was applied to the alfalfa/Select plots (Treatment #2) for bluegrass control on those dates. The plots were harvested four times in 2002 and three times in 2003. In addition to measuring total forage yield in tons of dry matter per acre (T DM/A), botanical separation of representative samples was done to determine the percent alfalfa, perennial forage grass (timothy or orchardgrass), roughstalk bluegrass, and other weeds in each plot. For the first cutting each year, forage quality analysis and milk yield calculations for each botanical component were done by Dairy One Forage Laboratory. The University of Wisconsin Alfalfa/Grass Evaluation System - MILK 2000 was used to calculate milk yields/T DM and milk yields in lb/A.

Forage Yield and Quality

Total forage yields and percent of the botanical components for first cuttings are shown in Table 1. In 202, first cutting forage yield from the untreated alfalfa check was 2.51 T DM/A with 46% of that yield from bluegrass. In 2003, first cutting forage yield from the untreated alfalfa check was 1.68 T DM/A with 30% of that yield from bluegrass. Select herbicide controlled 100% of the bluegrass both years but reduced forage yield to 1.39 and 1.11 T DM/A in 2002 and 2003 respectively. Forage yields for the alfalfa/timothy and alfalfa/orchardgrass treatments ranged from 2.36 to 2.97 T DM/A and were similar to the alfalfa check in 2002. In 2003, the alfalfa/timothy yields averaged 1.71 T DM/A and were similar to the alfalfa check. The alfalfa/orchardgrass mixtures yielded more than the alfalfa check and averaged 2.08 T DM/A. There was no bluegrass in either of the alfalfa/orchardgrass treatments in either year and bluegrass was responsible for no more than 8% of the first cutting yield for the alfalfa/timothy treatments either year.

Forage from the alfalfa check, which had 40 and 55% alfalfa in 2002 and 2003 respectively had a crude protein (CP) of

Table 1. Total forage yields and percent composition of alfalfa, timothy/orchardgrass, roughstalk bluegrass, and weeds from first cuttings on May 29, 2002 and May 28, 2003.

Forage	Yield		Botanical Composition (%)									
Treatments	(T DM/A)		Alfalfa		Timothy		Orchard		Bluegrass		Weeds	
	'02	'03	'02	'03	'02	'03	'02	'03	'02	'03	'02	'03
1. Alfalfa 12 lb/A Check	2.51	1.68	40	55	4	0	0	0	46	30	10	15
2. Alfalfa 12 lb/A Select	1.39	1.11	77	82	0	0	0	0	0	0	23	18
3. Alfalfa 12 lb/A Timothy 5 lb/A	2.97	1.70	13	55	82	34	0	0	5	8	0	3
4. Alfalfa 12 lb/A Timothy 10 lb/A	2.81	1.73	17	52	79	42	0	0	3	5	1	1
5. Alfalfa 12 lb/A Orchard 5 lb/A	2.72	2.14	5	12	0	0	94	88	0	0	0	0
6. Alfalfa 12 lb/A Orchard 10 lb/A	2.36	2.03	2	6	0	0	98	94	0	0	0	0
LSD (P = 0.05)	1.1	0.2	18	19	7	13	1	1	9	3	13	13

16.6% in 2002 and 17.4% in 2003, while the alfalfa/Select treatment had 77% alfalfa and 22.1% CP in 2002 and 82% alfalfa and 19.3% CP in 2003. The alfalfa/timothy treatments averaged 14.8% CP in 2002 and 16.9% CP in 2003. Alfalfa/orchardgrass treatments averaged 12.8% CP in 2002 and 11.1% CP in 2003.

Calculated Milk Yields

Milk yields in pounds of milk per ton of dry matter are shown in Figure 1. The alfalfa/Select treatment with 77% of the forage from alfalfa and 22.1% CP would have produced 3159 lb of milk/T DM in 2002. This was significantly greater than the expected production from all other treatments. There was no difference in expected milk yield/T DM among the alfalfa check (2871 lb) and the two alfalfa/timothy treatments with an average of 2833 lb. The alfalfa/orchardgrass treatments not only had the lowest % CP, they were the lowest in expected milk/T DM in 2002. In 2003, the alfalfa/Select treatment had 82% of the yield from alfalfa with 19.3% CP and would have produced 2979 lb of milk/T DM. This was similar to the lb of milk T DM from the alfalfa check and the alfalfa/timothy treatments but greater than from the alfalfa orchardgrass treatments.

The expected milk yield/T DM is a reflection of forage quality while the expected milk yield/A is the measure that combines forage yield and quality. Although the alfalfa/Select herbicide treatment had the highest % CP (22.1 and 19.3%) both years, it also had the lowest forage yield (1.39 and 1.11 T DM/A) both years because the herbicide removed both the bluegrass and the desirable grasses. As a result, the calculated milk yield in lb/A was only 4382 lb/A in 2002 (Figure 2). This was not significantly less than the milk yield from the alfalfa check which had 16.6% CP and an expected milk yield of 7198 lb/A or less than the milk yield/A from the two alfalfa/orchardgrass treatments. The alfalfa/timothy treatments did produce an expected milk yield per acre greater than the alfalfa/Select herbicide treatment in 2002. In 2003, the calculated milk yield in lb/A for the alfalfa/Select treatment was less than that of any other treatment with only 3302 lb/A (Figure 2). The alfalfa/orchardgrass would have produced the most milk per acre with an average of 5625 lb/A even though these treatments had the lowest % CP (average of 11.1%). As is so often the case, milk yield per acre was simply a reflection of forage yield in 2003.

These results demonstrate that perennial forage grasses, either timothy or orchardgrass, effectively suppress bluegrass and that orchardgrass is more effective than timothy for this purpose. The results also show that seeding rates (4-6 lb of seed per acre) for these grasses in the "Cornell Guide for Integrated Field Crop Management" are adequate and suggest that even lower seeding rates might do the job.

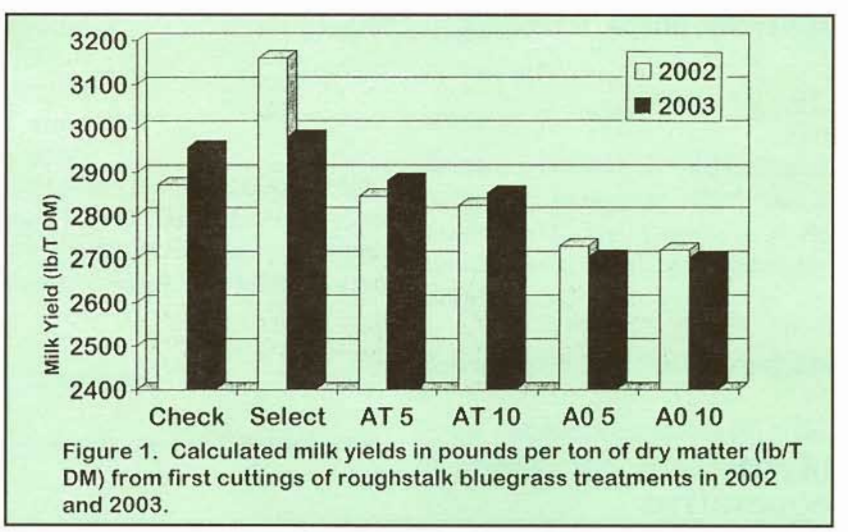

Figure 1. Calculated milk yields in pounds per ton of dry matter (lb/T DM) from first cuttings of roughstalk bluegrass treatments in 2002 and 2003.

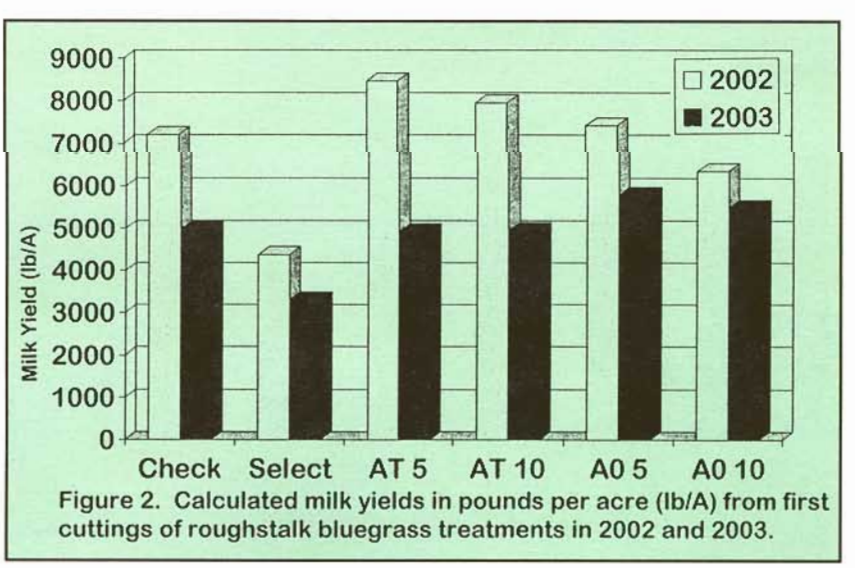

Figure 2. Calculated milk yields in pounds per acre (lb/A) from first cuttings of roughstalk bluegrass treatments in 2002 and 2003.

Calendar of Events

Mar 4, 2004	North Country Corn Congress, Miner Institute, Chazy, NY
Mar 4, 2004	Quality Forage Forum, Fire Hall, North Java, NY
Mar 5, 2004	Quality Forage Forum, Randolph, NY
July 11-14, 2004	Northeastern ASA/SSSA Branch Meeting, Bordentown, NJ
October 26, 2004	Field Crop Dealer Meeting, Comfort Suites, 7 Northside Drive, Clifton Park, NY
October 27, 2004	Field Crop Dealer Meeting, Ramada Inn, 141 New Hartford St., New Hartford, NY
October 28, 2004	Field Crop Dealer Meeting, Batavia Party House, 5762 E. Main Rd., Batavia, NY
October 29, 2004	Field Crop Dealer Meeting, Auburn Holiday Inn, 75 North St., Auburn, NY
Nov 1-4, 2004	ASA-CSSA-SSSA Annual Meeting, Seattle, WA

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.**

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