What's Cropping Up?

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Do Soybeans Respond to Starter Fertilizer and Seed Inoculum?

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New York farmers typically plant soybeans following corn into fields that test medium-high to high in P. For soils testing medium to high in phosphorus, Cornell University recommends the addition of not more than 15 to 25 lbs of P_2O_5 and a similar amount of N. Soybeans, however, are usually planted in late May or early June when average soil temperatures exceed 60°F and soil organic matter mineralization takes place. This raises the question whether a small amount of N and P starter fertilizer is really needed and how seed inoculation affects the fertilizer recommendations, especially the N recommendation.

We initiated the 3-year study in 1999 to examine the response of soybeans to starter fertilizer application (15 lbs N and 55 lbs of P_2O_5, applied as 14 gallons/acre of 10-34-0) with or without the addition of Cell-Tech and Hi-Stick seed inoculum on fields testing high in soil test P (Morgan extractable P of 9 to 39 lbs P/acre). Responses were tested in fields that had never been planted to soybeans or had been planted 4 to 5 times to soybeans in the 1990s. We tested in fields with or without a soybean history because seed inoculum is recommended in fields without a soybean history but not in fields with a soybean history. The 1999 growing season was extremely dry, 2000 was very wet, and 2001 was moderately dry.

When averaged across the 3 years, the use of Cell-Tech inoculum increased soybean yields when compared with the check (no starter fertilizer or inoculum) in fields with a soybean history (Table 1). Likewise, the use of Hi-Stick inoculum plus starter fertilizer increased soybean yields when compared with the starter fertilizer treatment. Apparently, soybeans can respond to the use of seed inoculum in fields with a soybean history under New York growing conditions. The use of starter fertilizer, however, did not increase soybean yields in the presence or absence of inoculum in fields with a soybean history. Apparently, soybeans do not require starter P fertilizer in fields that test high in P.

When averaged across the 3 years, the use of Cell-Tech and Hi-Stick seed inoculum increased soybean yields in the presence or absence of starter fertilizer in fields without soybean history (Table 2). Averaged across the 3 years, no differences in yield increase were observed between Cell-Tech and Hi-Stick inoculums. Also, the use of starter fertilizer did not increase soybean yields in the presence or absence of inoculum. Apparently, soybeans do not respond to starter fertilizer N and P under New York growing conditions even in fields with no soybean history.

We recommend the use of inoculum for all soybean plantings, even in fields with a soybean history. Also, we do not recommend any starter fertilizer P for soybeans in fields that test high in P (Cornell Morgan test $\geq$ 9 lbs P/acre).. Finally, we do not recommend the use of starter N fertilizer for soybeans, even on fields with no soybean history.

Table 1. Soybean yields under different inoculum and starter fertilizer combinations in fields *with soybean history* in 1999, 2000, and 2001 at the Aurora Research Farm.

Treatments	1999	2000	2001	Mean
	-----	bu/acre	-----	
Cell-Tech	30	46	45	40
Hi-Stick + Starter[†]	32	45	42	40
Cell-Tech+Starter	30	46	42	39
Hi-Stick	31	44	42	39
Starter	31	43	40	38
Check	32	42	39	38
LSD 0.05	NS	2	3	2

[†]Starter fertilizer was applied at a rate of 15 lbs N and 55 lbs P_2O_5/acre. Soils tested high for phosphorus availability.

Table 2. Soybean yields under different inoculum and starter fertilizer combinations in fields *without soybean history* in 1999, 2000, and 2001 at the Aurora Research Farm.

Treatments	1999	2000	2001	Mean
	-----	bu/acre	-----	
Cell-Tech+Starter[†]	25	52	35	37
Cell-Tech	25	49	35	36
Hi-Stick + Starter	23	50	35	36
Hi-Stick	22	51	32	35
Starter	24	45	32	34
Check	21	47	32	33
LSD 0.05	NS	7	3	2

[†]Starter fertilizer was applied at a rate of 15 lbs N and 55 lbs P_2O_5/acre. Soils tested high for phosphorus availability.

Nutrient Management

Site-Specific Nitrogen Fertilization

Jason Kahabka, Dept. of Crop and Soil Sciences, Cornell University

Introduction

The concept of site-specific nitrogen application appeals to many crop producers who are seeking ways to reduce fertilizer costs in this climate of increasingly expensive N fertilizer options. There are a number of good variable-rate sprayers and controllers on the market but an effective site-specific sprayer system takes more than technology. In order to recognize real gains from Variable Rate Technology (VRT), producers must be able to identify areas within a field that would benefit from N fertilizer rates significantly different from the prescribed uniform rate.

Numerous attempts have been made to predict the spatial crop response to nitrogen fertilization. Soil drainage class is often considered a primary source of nitrogen variability, yet recent Cornell studies report limited correlation between drainage class and economic rate of N fertilizer. Instead, early-season weather variability was determined to greatly influence yield response to N needs.

Research

To better understand opportunities for site-specific nitrogen fertilizer management a three-year experiment was begun in 1998. This study was conducted at Cornell University's Robert Musgrave Experimental Farm at Aurora, NY. The design included two crop rotations (corn-corn and corn-soy), two tillage treatments (zone-till and chisel-till) and four nitrogen fertilizer rates. The objectives of this study were to evaluate site-specific yield response of corn to N and assess opportunities for improved management and profitability using variable rate technology.

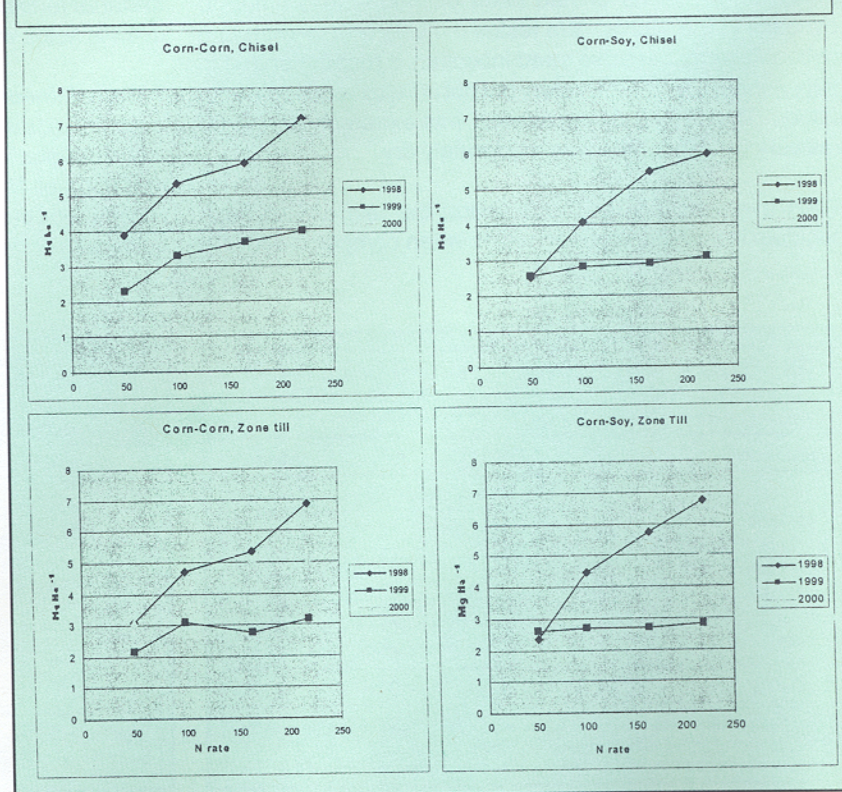
The yield response in 1998 differed dramatically from 1999 and 2000. The warm, early spring and above average precipitation in June of 1998 caused a flush of N mineralization and subsequent leaching loss. All treatmets received 50 lbs N / acre at the time of planting. The response curves (Figure 1) for this year demonstrate increasing yields up to 155 lbs/ acre sidedress N, indicating that the maximum yield potential may not have been reached even at the highest experimental rate. A conventional analysis of the yield response for the three years would suggest that the field scale economic optimum N sidedress rate is 50 lbs/ acre for years 1999 and 2000 and 155 lbs/ acre sidedress N in 1998.

Understanding Spatial Structure

The first step in the formulation of a site-specific fertilizer plan is determining the extent and scale of spatial variability. If soil nutrient distribution is completely random or variable at a very small scale then site-specific application will not be practical.

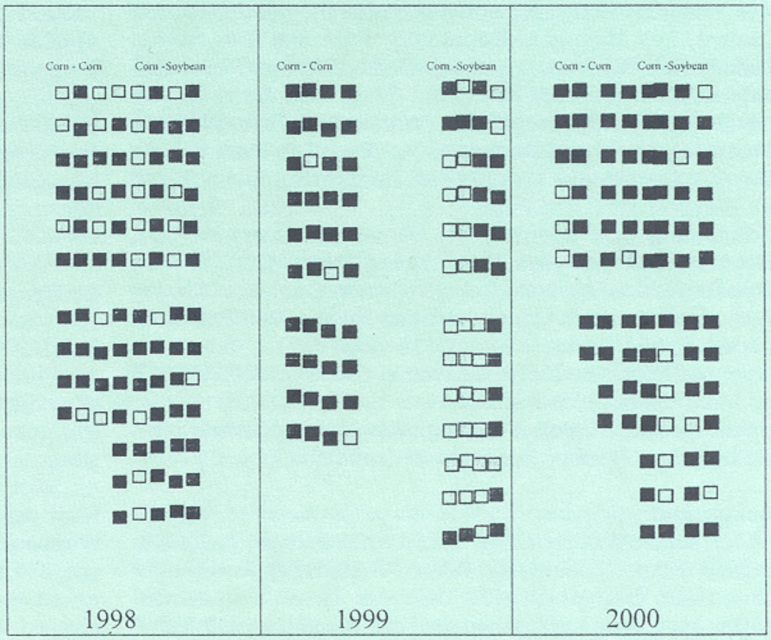
The next step is to determine the extent to which this variability can be used as a predictor of optimal fertilization rate. Intensive soil sampling revealed that soil nitrate (NO_3) had strong spatial structure within this research field, meaning there are distinct zones of low and high NO_3 levels (Figure 2). The field was analyzed to see if regions within the field would have an economic optimum N rate different

Figure 1. Yield response curves for four N rates years 1998 through 2000.



from the mean field-scale recommendations. To perform this analysis the field was subdivided into 95 regions, each having the four sidedress N treatments. Individual regions were analyzed using grain harvest data from a yield monitor to determine its optimal N rate. The map of optimal N rates shows little spatial structure and low spatial correlation to the PSNT data.

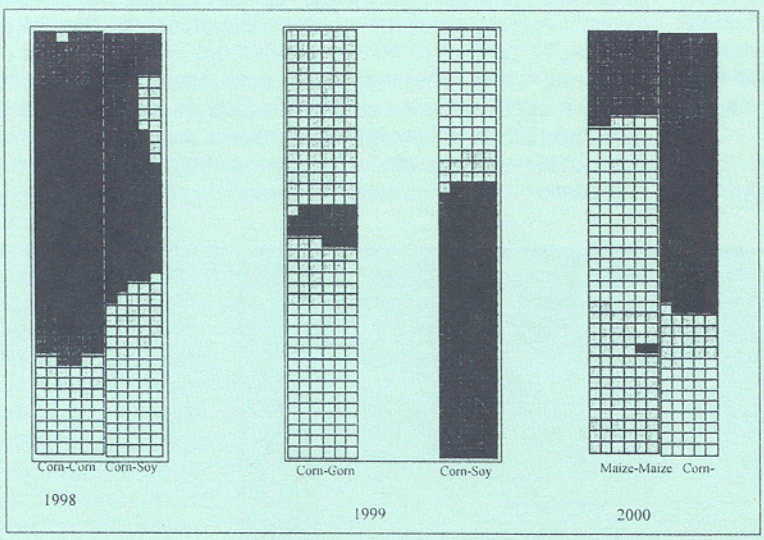
Figure 3. Spatial structure of N response. Optimal fertilization rates are not strongly correlated with PSNT values.



Conclusions

These results suggest that the potential for the effective use of site-specific N applications is very limited. It was difficult to forecast optimal N fertilization rates even using yield data at end of the growing season with the benefit of hindsight. The lack of year-to-year consistency in N response, in terms of the field averages and spatial structure, indicate that appropriate site-specific rates cannot be predicted with reasonable accuracy. Conventional N fertilizer recommendations based on PSNT results cannot simply be applied in a site-specific management approach. The poorly defined spatial structures of yield response to N make the site-specific application of nitrogen unpractical in most cases unless explicit sources of variability can be identified and mapped. Growers considering the implementation of zone-till systems should be encouraged by the similar N response in the zone and chisel-till plots reported in this experiment.

Figure 2. Soil NO_3 maps showing the spatial structure.



The limited potential for site-specific application of nitrogen should not distract from the fact that great improvements in N use efficiency can be gained from better prediction of crop N needs on and annual basis. The 120 kg ha-1 difference in optimum N rates between 1998 on one side and 1999 and 2000 on the other, as well as the annual variability in N carryover from soybean rotation support efforts to refine N management based on weather information.

Nutrient Management

Phosphorus Starter Project - Results of the 2001 Growing Season

Tim Byron and Quirine Ketterings, Dept. of Crop and Soil Sciences, Karl Czymmek, PRO-DAIRY, Cornell University
Nutrient Management Spear Program: http://www.css.cornell.edu/nutmgmt/index.html

Participating producers: John Hourigan (Jordan), Steve Nemec (New Hope), Rick Holdridge (Bloomville), Wayne Wood (Northumberland), Mike McMahon (Homer), Maurice Stoughton (Newark Valley), Gary Gaige (Mecklenburg), Dudley French (Chemung), Greg Coller (Dekalb), Clark Decker (Stockholm), Dave Fisher (Madrid), Lou Ann King (Madrid), Jon Greenwood (Canton), Les Hargrave (Depeyster), Paul and Tim Heiden (Madrid), Ken Pemberton (Lisbon), Charlie Roberts (Fort Jackson), Kevin McCollum (Canton), Glenn and Larry Taylor (Cassville), Randy Brouillette (Waterville), Rob Williams (Waterville), David and Andrew Kross (Earlville), Mark Jahnke (Cherry Valley), Steve Natalie (East Springfield), and Joe and Kirk Schwasnick (Little Falls).
Participating CCE agents: Pete Barney (St. Lawrence Co.), Shawn Bossard (Cayuga Co.), Janice Degni (CCTTS Area Extension Specialist), Mike Dennis (Oneida Co.), Dale Dewing (Delaware Co.), Kevin Ganoe (Mohawk Region Area Extension Specialist), and Dayton Maxwell (Saratoga Co.).
Other participants: Elaine Dalrymple (Schuyler Co. SWCD) and Mark Ochs (Consultant).
Sponsors: NRCS (project funding), Agway's Lyon blend plant (fertilizer) and Pioneer International (seed).

Background

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 in P. That year, ten on-farm demonstration trials were established on soils ranging in soil test P (STP) levels from 14-118 lbs P/acre (Cornell soil test). Trials were conducted in seven different counties: Cayuga (2), Delaware (1), Clinton (1), Herkimer (1), Otsego (3), Schuyler (1), and Tioga (1). Cornell recommendations for P_2O_5 use on each of these sites amounted to 20 lbs/acre or less. At each location two P application rates were tested: 200 lbs 10-0-10 (without P) and 200 lbs 10-10-10 (with P). The results of these trials showed that on average no yield increase was obtained by adding starter P in a 2" by 2" band to soil testing high to very high in P, even in a cool spring (see What's Cropping Up? 2001, Volume 11, no 3). There was some variation in the data but the number of trials was not large enough to assess whether planting date, recent manure applications and or soil type (slowly warming clay versus quickly warming sandy soils) could have made any difference.

In 2001, we expanded the number of treatments per farm and the number of farms and added three replicated trials at Cornell experimental stations to address four main questions:
1) How big a difference in yield do we need to have to account for field variability and make sure that what we measure is a real difference (LSD or Least Significant Difference)?
2) Do we need the N and K in the starter?
3) Does the effect of starter P application vary depending on planting date, recent (last year) manure application or soil textural class?
4) Can we reproduce small-scale experimental plot results at the farm field-scale?

Replicated Research Trials (experimental stations)

Replicated trials were established at Batavia's New York Crop Research Facility (STP=21 lbs P/acre), the Musgrave Research Farm in Aurora (STP=10 lbs P/acre), and Cornell University's Willsboro Research Farm in Essex Co. (STP=14 lbs P/acre). The Cornell guide recommended no more than 20 lbs P_2O_5/acre at each of the sites. There were in each location four replicates of three treatments: 200 lbs/acre of 10-0-10 (no P_2O_5), 200 lbs of 10-10-10 (20 lbs P_2O_5), and 200 lbs of 10-20-10 (40 lbs P_2O_5). These fertilizers are blends of urea, diammonium phosphate (DAP), potash and a filler, mainly limestone. A 99-day corn (Pioneer 37M34) was planted at all sites.

Field days were held on August 15th in Aurora, August 2nd in Willsboro, and on August 23rd in Batavia. To test if it was possible to visually differentiate treatments, participants were asked to evaluate the plots. The results of this evaluation showed that 60 participants (75%) could not correctly identify the treatments applied to 8 or more out of 12 plots. Five of these 60 were mistaken in all 12 plots. Only one participant out of 80 was able to correctly identify the treatments in all 12 plots. Many participants had expected visual differences but survey results showed that it was impossible to identify treatments by eye.

Plant height measurements from planting until tasseling confirmed visual observations as did yield. The yield results are shown in Table 1. The low yields at Batavia reflect drought conditions during the growing season. During 2001, April through August precipitation was 50 percent of normal at Batavia, 77 percent of normal at Willsboro and 88 percent of normal at Aurora. The near record amounts of March precipitation in 2001 recorded at Aurora (226 % of normal) and Willsboro (325 % of normal) may further account for the higher yields at these two locations compared to Batavia where March precipitation was 70 percent of normal.

Table 1: Effects of P starter rate (0, 20 or 40 lbs P_2O_5/acre) on corn silage yields. Results from replicated trials at Cornell experimental stations in Aurora, Batavia and Willsboro, NY.

	Corn Silage Yield (tons/acre 35% dry matter)				
	Soil test P (lbs P/acre)	200 lbs 10-0-10	200 lbs 10-10-10	200 lbs 10-20-10	LSD* (α=0.05)
Aurora	10	16.6	16.9	17.1	1.0
Batavia	21	12.7	12.5	12.2	1.0
Willsboro	14	15.9	16.3	17.3	5.4
Average	15	15.1	15.3	15.5	1.6

* Least Significant Difference.

At all three locations, yields were not significantly affected by adding P. An increasing trend was observed in Willsboro. However, damage caused by deer, birds, raccoons and a bear resulted in a large LSD. The results showed that for our sites an increase of about 1 ton/acre was needed to determine if starter P response was statistically significant and not just a result of random variability within the field.

Grain yields varied from 54 bu/acre in Batavia and 91 bu/acre in Willsboro to 124 bu/acre in Aurora. The plot results showed that on average, 5.9 bu grain (15% moisture) equaled 1 ton of silage (35% dry matter). Maturity, as expressed by the moisture content at harvest, was also not affected by the amount of P in the starter. All trials were harvested at 30-33% moisture content for silage and 22-25% moisture for grain yields. An investigation of treatment effects on forage quality is underway.

On-farm Demonstration Trials

In 2001, the starter P project included 27 separate trials among 24 cooperators in 12 NY counties (Cayuga, Chemung, Chenango, Cortland, Delaware, Herkimer, Oneida, Otsego, Saratoga, Schuyler, St. Lawrence, Tioga Co.). The trials were conducted on soils ranging in soil test P from 4 to 155 lbs P/acre. Soils in 4 trials fell in the "medium" range (4-8 lbs P/acre); 14 in the "high" range (9-39 lbs P/acre); and soils in 9 trials were in the "very high" range ($\geq$40 lbs P/acre). Of the 27 trials, 20 received applications of solid or liquid manure ranging from eight to 40 tons/acre and from 3,000 to 10,000 gallons/acre in 2001. At five locations, sidedress N was applied. Soil types were widely variable in pH, texture, parent material, position on the landscape, etc.

The number of treatments varied among the trials. Most typically they included comparisons of yields obtained without starter fertilizer (16 trials), with starter fertilizer containing no P (25 trials), with starter containing 25 lbs of P_2O_5/acre or less (24 trials), and with starter P application of >25 lbs P_2O_5/acre (14 trials). The latter category consisted of the producer's fertilizer blends and rates. The amounts of P added in the producer blend and rate varied from 10 to 91 lbs P_2O_5/acre. Producer application of P exceeded recommended levels by 10 lbs or more at 12 of the 14 farms.

Drought severely affected some parts of NY in 2001. There were large yield differences among counties and farms that, at least partly, resulted from the uneven distribution of rainfall during the growing season. The drought did reduce yields but did not change the effects of P starter application.

Table 2. Corn silage yields as affected by use of starter fertilizer and amount of P in the starter band. These results are averages of 27 on-farm demonstration trials.

Treatment	Corn silage yield (tons/acre 35% dry matter)	Significant? (α=0.05)
No starter	16.7	B
No P_2O_5 in starter	19.3	A
10-25 lbs P_2O_5 in starter	19.9	A
>25 lbs P_2O_5 in starter	19.8	A

Nine trials were harvested for grain corn while 21 were harvested for silage. For trials where no silage was harvested, grain yields were converted to a silage equivalent by assuming that 1 ton of silage equals 5.9 bu/acre of grain. Treatment means for silage yield are given in Table 2.

The three A's for the different P treatments in the "significant?" column mean that yields were unaffected by P application. These results are consistent with the results of the replicated trials at the research farms. Recent manure history, actual soil test P level, textural class and planting date did not affect the results in Table 2.

The "B" for significance in Table 2 implies that the yields obtained without starter fertilizer application were significantly lower than those obtained where N and K were added. Thus, we do see a statistically significant response to starter N and K application. Because N and K were always added together, we cannot separate their individual contributions in this experiment, though the literature indicates that for fields where K levels are adequate, the response is very likely due to N alone.

When considered alone, the economic advantage per acre for reducing P_2O_5 is not large. The cost of 200 lbs of 10-0-10 is $13.00 versus $13.50 for 200 lbs of 10-10-10 and $16.00 for 200 lbs of 10-20-10. However, reducing starter P levels to the recommended range protects crop yield and reduces the unnecessary and potentially costly accumulation of P on dairy and livestock farms.

Conclusions

On average, corn grain and silage yields on the 27 trials showed no response to additions of P in starter fertilizer applied to soils falling mostly in the high and very high STP categories. We recommend the application of N in the starter band. No yield penalty is expected when P starter levels are dropped to 25 lbs/acre or less for soils testing high or very high in P, especially when manure is applied.

The NY Starter P Project in 2002

The starter P project will be continued in 2002. Replicated trials will be established at the Musgrave Farm in Aurora, Willsboro Farm, Mt Pleasant Farm, Morrisville College, Empire Farm Days, and Ron Stutzman's research farm. We are looking for farmer participation for the on-farm trials. Participation includes the establishment of at least a 2-row and 100 feet long strip of each of the following 4 treatments: 1) no starter; 2) 200 lbs of 10-0-10 (i.e. no P in the starter); 3) 200 lbs 10-10-10; and 4) the producers' own blend and application rate. We will provide the 10-0-10 and 10-10-10. For more information contact Quirine Ketterings (qmk2@cornell.edu or 607 255 3061), Karl Czymmek (kjc12@cornell.edu or 607 255 4890) or Tim Byron (tmb29@cornell.edu or 607 255 9875).

Crop Management

PERENNIAL FORAGE SPECIES IN 2002

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Debbie J.R. Cherney, Dept. of Animal Science, Cornell University

Most NYS forage producers are faced with three major choices for perennial forages: pure alfalfa, alfalfa-grass, or pure grass. While other legume species are available, none provide the yield or persistence of alfalfa when grown on "alfalfa" soils. If the new disease resistant *Pardee* birdsfoot trefoil will consistently survive on NYS soils it will be a major addition to our list of top choices.

Selection begins with an assessment of the soil. Can alfalfa persist and do well on the site or not? If alfalfa cannot persist by itself, a mixture of alfalfa-grass or pure grass alone should be considered. This is the most important decision in the entire process. New York State soils have a tremendous range in yield potential that is controlled in large part by drainage issues. The potential yield of orchardgrass on all 640 NY agricultural soil types as influenced by native drainage is graphically shown in Figure 1.

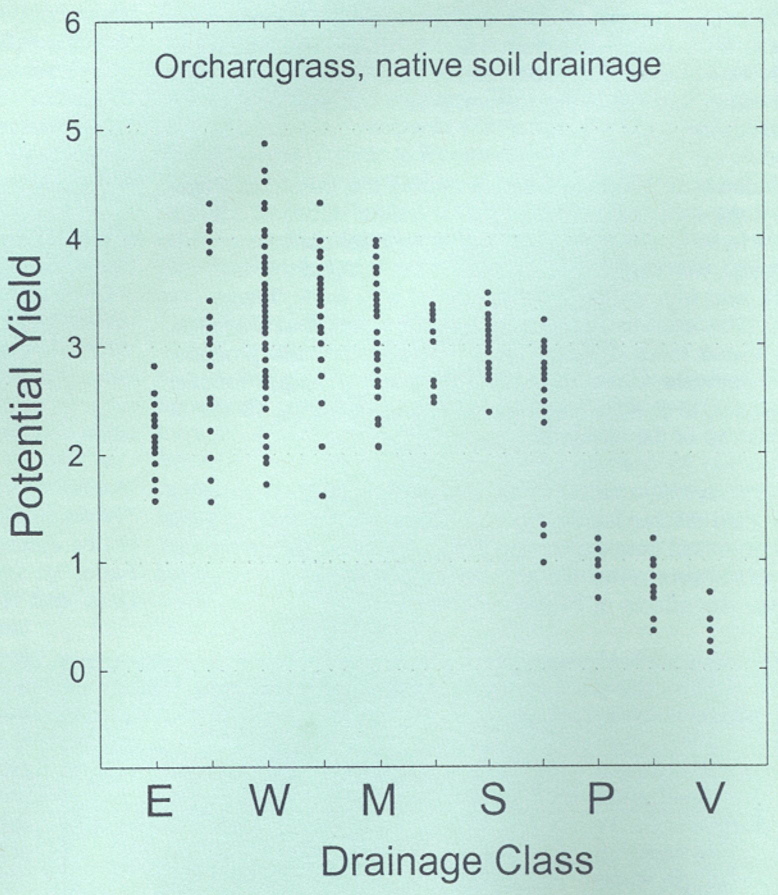
Alfalfa Selection

If alfalfa can persist on a site for three or more years, alfalfa-grass is an ideal choice. Alfalfa variety selection for persistence is the next consideration. This involves selection of alfalfa with the proper fall dormancy rating, as well as resistance to any diseases of concern in your area. This is followed by selection for yield. When yield trials are conducted over several years, information on persistence as well as yield is generated. The best method for comparing alfalfa varieties for NYS is to use the following website: http://www1.uwex.edu/ces/ag/alfalfa/. This program has an easy to use format for comparing any particular alfalfa variety with other varieties or with check varieties. Only after all of the above has been accomplished can variety selection for quality be considered.

Grass Selection

Grass variety selection for heading date is important, because it allows the quality of the grass to be aligned with alfalfa. Most new timothy varieties are early and most new orchardgrass varieties are late, to better match up with alfalfa. Heading dates in the spring for perennial grasses vary among species and over years (Table 1). We determined heading date as the date that we found six heads visible emerging from the boot. This date could be considered very early heading or very late boot stage. All grass species headed earlier than normal in 1997 and considerably later than normal in 1998. In 2001 grasses generally headed earlier at the central NY Mt. Pleasant location compared to the two northern NY sites. The exception was timothy, which headed in central NY a week later than northern NY in 2001. The reason for the very early heading

Figure 1. Orchardgrass yield as influenced by soil type and native soil drainage. 640 different soil types represented by ●. (E=extremely well drained; W=well drained; M=moderately well drained; S=somewhat poorly drained; P=poorly drained; V=very poorly drained).



of timothy in northern New York in 2001 is not clear. Most of the time, however, the relative order of species for heading is consistent, with a typical spring harvest date of the third or fourth week of May.

Maturity is the single most important factor controlling forage quality in grasses (assuming no anti-quality components). Spring heading date, therefore, is an important criterion for both species and variety selection. The general order of grass species heading date from earliest to latest in NYS is:
Orchardgrass > Perennial ryegrass > Smooth bromegrass = Tall fescue > Reed canarygrass > Timothy.

Evaluate the possibilities for perennial grass on sites where alfalfa cannot persist due to poor drainage, low pH, shallow soils, or snout beetle infestations. Where grass will be seeded alone, look first for species with strong persistence. Timothy, orchardgrass and reed canarygrass all have good persistence potential under a 3 or 4-cut grass management. Timothy, however, will consistently produce forage that is about two percentage units lower in crude protein than either orchardgrass or reed canarygrass. Ryegrasses and Matua prairie grass have lacked winterhardiness in NYS in past studies, although new perennial ryegrass varieties likely have better persistence. We have insufficient information to fully assess meadow fescue, meadow brome or Festulolium species. Grass species selection in NYS specific to soil type and intended forage use is best determined with the NYS perennial forage selection program (http://www.forages.org).

Also consider anti-quality factors when selecting grass varieties. For example, in reed canarygrass, choose only low-alkaloid varieties. If selecting tall fescue, choose only low-endophyte seed. Alkaloids and endophytes in grasses reduce palatability and limit animal performance. Heading date is important in setting quality potential, first harvest should be before heading for lactating dairy cow feed. Select varieties and/or species with differing heading dates to allow manipulation of the spring harvest window.

Yield differences between grass varieties within species tend to be small, and should be the last consideration. Yield information on many grass varieties is available from Cornell and company trials, but heading date carries more importance. Following the sequence described here should maximize the chances of selecting high quality, high yielding perennial forages that will persist on any given site.

Table 1. Perennial grass heading dates in NYS. Average of six locations in 1997 and four locations in 1998. Varieties within each species were averaged. Varieties used for 1997-1998 were different from 2001. All varieties had a minimum of two replicates averaged for heading date. Average orchardgrass heading date for Mt. Pleasant in 2001 was estimated because many of the orchardgrass varieties had recently headed prior to the start of heading observations. (Heading notes for 2001 taken by Pete Barney, Sam Beer, Mike Davis, and Leon Hatch).

Species	1997	1998	2001	2001	2001
			Mt. Pleasant	Chazy	Canton
Orchardgrass	May 15	June 4	May 20 (est.)	May 28	May 29
Timothy	May 26	June 13	June 7	May 27	May 27
Reed canarygrass	May 25	June 13	June 2	May 31	May 31
Smooth bromegrass	May 21	June 6	May 26	May 24	May 27
Tall fescue	May 20	June 6	May 24	May 28	May 25
Perennial ryegrass	May 18	June 7	May 30	May 31	May 26
Meadow fescue	-	-	May 24	May 31	May 24
Festulolium	-	-	May 25	June 2	May 26

Forage management to produce high yields of high quality fiber in the diets of lactating cows will lower feed costs and may also improve rumen health. Perennial grass forage can deliver milk production similar to that found using alfalfa forage, but good grass haylage is more difficult to make than good alfalfa haylage. Intensive, aggressive perennial grass management and feeding is essential for economic survival on dairy farms with soils not suited to alfalfa production.

Calendar of Events

April 5, 2002	2002 Winter Nutrient Management Retreat, Cortland Grange, Cortland, NY
July 14-17, 2002	Northeastern Branch ASA Meeting, Morgantown, WV
July 27-31	American Phytopathological Society Annual Meeting, Milwaukee, Wisconsin
October 1-3	Northeastern Division of American Phytopathological Society, Bromont, Quebec
October 22, 2002	Field Crop Dealer Meeting, Chaucers Rest. & Banquet House, Clifton Park, NY
October 23, 2002	Field Crop Dealer Meeting, Ramada Inn, New Hartford, NY
October 24, 2002	Field Crop Dealer Meeting, Batavia Party House, Batavia, NY
October 25, 2002	Field Crop Dealer Meeting, Holiday Inn, Auburn, NY
November 10-14, 2002	ASA-CSSA-SSSA Annual Meetings, Indianapolis, IN

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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