What's Cropping Up?

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Winter-Forage Small Grains to Boost Feed Supply: Not Just a Cover Crop Anymore!

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Many NY dairies will need to rebuild forage inventory going in to 2013. Some farms are starting to take advantage of winter grains for spring harvest before corn planting. Properly managed, these crops can supply 2-4 tons of dry matter per acre (table 1), and in some fields in 2012 we measured up to 5 tons of dry matter of high quality forage from small grains planted after corn silage, even with little growth in the fall.

> ***Bottom line**:*
> *Winter small grains are easy to grow and when harvested for forage in spring make excellent feed and can provide a significant boost to forage inventories.*

Crop:
The main options are winter wheat, cereal rye or winter triticale. In 2011, we measured yields on all three species in a trial at the Valatie Research Farm in eastern NY and the results were very similar (2.31, 1.92, and 1.96 tons DM/acre for rye, triticale and wheat, respectively, sampled at optimal harvest time for forage). The data for 2012 are shown in Table 2. Triticale yielded between rye (highest biomass) and wheat (lowest biomass) consistently in both years. Triticale is very resistant to lodging when harvested for forage and has a great nutrition profile.

Planting:
Winter grains are very well suited to no-till and will do nicely with a coat of manure after corn silage. Planting with a grain drill or air seeder is the best option to assure a good stand and to maximize value from certified seed. The crop should be planted as soon after corn silage as possible, ideally, mid-late September. The comparison at the Valatie Research Farm suggest that earlier planting produces considerably more biomass in the fall followed by high forage yields in the spring. However, all cereals produced more than 2.5 tons/acre DM (more than 7 tons/acre silage equivalent) even when seeded in October and with very little fall biomass production (Table 2). The later the planting the more critical the seed be placed 1 – 1.5 inches deep to prevent spring heaving from decimating the stand.

Table 1: Biomass fall and spring for winter cereals seeded in fall 2011 at locations across New York State. Since these are not side by side comparisons in the same field, the averages illustrate yield ranges and should not be compared directly to each other.

Cover Crop Species (# fields)	Previous Crop	Planting Date	Fall Above Ground Biomass	Spring Harvest Date	Spring Above Ground Biomass
			ton/acre		ton/acre
Rye (3)	Corn	9/23 to 10/8/'11	0.10	5/16+17/'12	2.14
Triticale (8)	Corn	9/12 to 9/23/'11	0.33	5/4+7/'12	2.03
Triticale (6)	Small grain	Sept-Oct/'11	0.94	5/17/'12	3.14
Wheat (3)	Corn	10/12/'11	0.32	5/17+ 6/2/'12	3.78

Fertilization:
Fields with a manure history and a coat of manure applied after corn silage before, with, or shortly after planting will not need any starter fertilizer in most circumstances. For optimum yield, the crop could need some available N (supplied by fertilizer – e.g. UAN or urea) when dormancy breaks in the spring. We have seen applications in

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the range of 50-100 pounds of actual N work well. We will be doing more testing to hone in on a spring N guideline and invite farmers to participate in on-farm trials in the spring of 2013 to determine how much fertilizer N is needed for optimal economic yield.

Harvest:
Flag leaf stage supports very high milk production with good yields. More biomass will be added through early head emergence, so harvest timing will depend on farm goals and weather conditions.

Bottom line:
Winter small grains are easy to grow and when harvested for forage in spring make excellent feed and can provide a significant boost to forage inventories.

Figure 1: A late planted crop can still generate high quality and high yielding forage in the spring. The pictures show triticale at one of the western NY sites in fall of 2011 (left; 0.2 tons DM/acre December 14, 2011) and at harvest time (right; 2.0 tons DM/acre May 11, 2012).

Table 2: Yield for fall seeded winter cereals grown as cover/double crop at the Valatie Research Farm. Seeding took place 10/5/2012 or 9/16/2012. The above ground biomass was harvested 5/2/2012.

Cover crop species	Planting Date	Fall Above Ground Biomass	N at Greenup	Spring Above Ground Biomass
		Tons DM/acre		Tons DM/acre
Rye	10/5/2011	0.13	No N	3.72
Rye	10/5/2011	0.13	40-0-0-4S	3.90
Wheat	10/5/2011	0.06	No N	2.63
Wheat	10/5/2011	0.06	40-0-0-4S	3.36
Triticale	10/5/2011	0.06	No N	3.05
Triticale	10/5/2011	0.06	40-0-0-4S	3.77
Triticale	9/16/2011*	1.06	40-0-0-4S	4.94

*The September seeding of the triticale received 150 lbs of 19-19-19 at planting.

Rye vs. Oat Cover Crops on a Manured Field: Environmental Benefits Vary Greatly

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Land application of manure creates conditions conducive to significant environmental losses of nutrients. Application of manure involves large amounts of the nutrients nitrogen and phosphorus, often resulting in excess residual levels - especially after dryer growing seasons. Losses are especially acute in the following winter and spring as excess water from snow melt and rain promotes runoff and erosion of P, leaching of nitrate, and emissions of nitrous oxide from denitrification. The latter is a significant greenhouse gas concern.

Cover crops are increasingly adopted for various purposes, including to suppress weeds, reduce runoff and erosion, build soil health, provide nitrogen (from legumes), or immobilize leftover nitrates. For manured fields, winter cover crops may have special benefits by limiting P losses through reduced runoff and erosion, and by scavenging residual N and making it unavailable for leaching and denitrification.

In this study, we tested the ability of oats (*Avena sativa* L.) and winter rye (*Secale cereal* L.) cover crops to reduce nutrient losses through multiple potential pathways during the early winter and spring season in a soil with a history of manure application. Winter rye and oats were selected due to their popularity in the northeastern USA and also for their differences in winter tolerance. Oats establish well in the fall but are winter killed in our climate, which eliminates the need to terminate their growth in the spring. Rye, on the other hand, survives through our winters and resumes active growth early in the spring. Both cover crops provide soil cover and take up residual N from the previous growing season, thereby reducing both N and P losses. We hypothesized that rye, which grows longer into the fall and re-establishes in the spring, is more effective at reducing environmental losses than oats.

Table 1. Biomass accumulation and N-uptake for rye and oats on 3 December 2010 and 28 April 2011. Different letters within a column for each date represent significant differences at α= 0.05.

	Biomass (lbs/ac)	N-Uptake (lbs/ac)	Total N uptake per cover crop (lbs/ac)
3 December			
Oat Shoots	142 b	7.8 b	8.7 b
Oat Roots	35 d	0.9 d	
Rye Shoots	414 a	20.7 a	23.5 a
Rye Roots	118 c	2.8 c	
28 April			
Rye Shoots	1098 a	22.0 a	25.2
Rye Roots	279 b	3.2 b	

Methods

This study was conducted on a working dairy farm located in Central New York using a field with a recent history of manure application. The soil at the research site is an Ovid silt loam with 4% average organic matter content in the surface soil and pH of 7.1. During the previous three years, manure was applied in April 2008, October 2009 and April 2010 (final application before study commenced) at total N rates of 145, 170, and 100 lbs per acre, respectively.

Winter rye and oats were broadcast seeded on 24 September 2010 after corn silage harvest in a spatially-balanced complete block design at a rate of 100 lbs per acre. Along with control plots, each cover crop treatment was replicated four times for a total of twelve plots. Quadrats of rye and oats were subsequently harvested on 3 December, 2010 and analyzed for N uptake. The Roots were harvested to a depth of 6 inches. Soil samples were taken on 3 December, 14 March, 7 April, and 28 April from the 0-to-6 and 6-to-12 inch soil layers for mineral N analysis. Also, on the latter two dates soil material was collected for measurement of nitrous oxide emission potential using a method involving simulated rainfall (to induce denitrification) and 96-hour incubation at the seasonal temperatures (50^{o}F for 7 April and 60^{o}F for 28 April). Soil water was sampled at 20 inch depth using a tension lysimeter to determine the nitrate content.

Results

Cover Crop Biomass and N Contents

The rye cover crop produced much higher levels of biomass than the oats during the fall season after seeding, as measured on 3 December (Table 1). Aboveground biomass was three times greater in the rye plots than oats, as the former grew more vigorously and was not affected by frost kill. Larger surface biomass for rye implies that it provides greater benefits for reducing runoff, erosion, and P losses. Also, rye nitrogen uptake was 23.5 vs. 8.7 lbs per acre (269% greater) compared to the oats. On 28 April, the rye had accumulated more than

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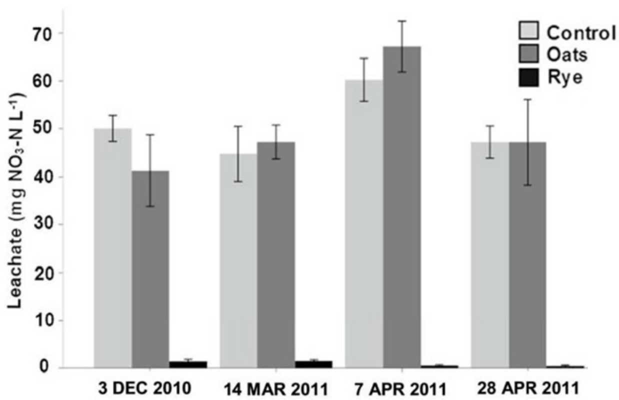

Figure 1. NO_3-N concentrations in soil water at 20 inch depth, which was below the cover crop root zone. N concentrations under the rye cover crop were very low, while those for oats were similar to the Control (no cover crop).

twice the biomass compared to 3 December, but the total N uptake was similar (about 25 lbs per acre; Table 1).

Nitrate Leaching

Cover crop effects on nitrate concentrations below the root zone (20 inch depth) were found to vary considerably (Figure 1). Rye significantly and markedly decreased NO_3-N concentrations compared to the Control and Oats treatments. Concentrations under oats in fact were about the same as the plots without cover crop – basically indicating that they had no benefit for reducing leaching. Throughout the spring season, average measured nitrate levels were 43, 52, and 1 mg NO_3-N L^{-1} for the Control, Oat and Rye plots, respectively.

Nitrous Oxide Emissions

While variability was high, both spatially and temporally, significant effects were found for nitrous oxide emissions but, treatment effects changed as the spring season progressed (Figure 2). The Oats treatment produced similar results to the Control throughout the sampling period while Rye decreased N_2O emissions in late April after a high initial flux earlier in the month. Higher emissions were measured at the early sampling from plots with cover crops, which had a relatively fresh carbon source that promotes denitrification. Reductions in the Rye plots later in April, were presumably the result of a smaller soil nitrate pool, as the rye cover crop had taken up much of the released N. Average emissions from the Rye treatment were roughly half of the Oats treatments during the final sampling.

Conclusions

The results of this study are clear: During the winter and spring period when field N and P losses can be high, rye cover crops show great potential to mitigate negative environmental effects. The rye accumulated much greater biomass than oats in the fall, providing better winter cover to reduce runoff, erosion, and P loss potential. Rye also had a very strong positive impact on reducing N leaching in the soil profile, as nitrate concentrations at 20 inch depth were extremely low throughout the sampling period. Oats showed no improvements in reducing nitrate leaching compared to the no-cover crop option.

Rye did not show reduced nitrous oxide emissions resulting from a simulated heavy rainfall event in early April, but showed a 70% decrease later in the month when it was actively taking up N and producing biomass. Oats had winter killed and therefore averaged consistently high emissions throughout the spring period.

In all, the rye cover crop had significantly greater positive effects in terms of reducing P and N loss potentials, while the benefits of the oats were minimal. Although results may vary seasonally, the winter hardy rye cover crop should be given strong preference over oats when the primary objective is to reduce nutrient losses to the environment.

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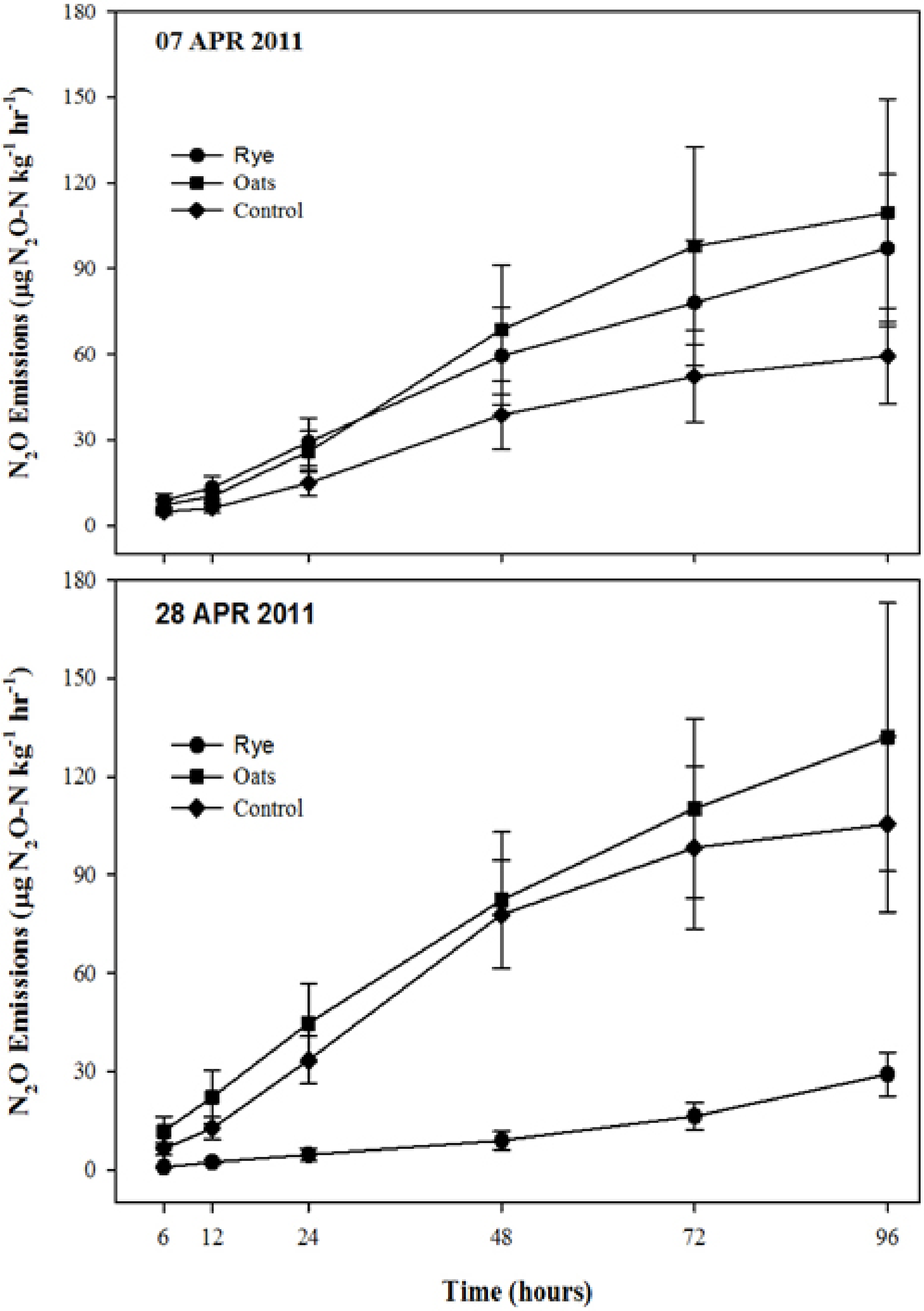
Figure 2. 96-hour cumulative nitrous oxide emissions in the early growing season for the rye and oats cover crops, and the control.



Crop Management

Recommended Corn Silage Hybrids for New York

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The ravages of the 2012 drought on corn production in the USA dramatically increased corn grain prices. Consequently, dairy producers in New York should increase the percentage of corn silage in the dairy ration to minimize the impact of high feed costs. Unfortunately, corn silage yields on many dairy farms in New York, especially on gravelly soils, were reduced by 15-25%. The silver lining to the drought-stressed 2012 crop is that fiber digestibility (NDFd) was above-average because of less secondary cell wall and lignin formation during vegetative development during the droughty period from late June through mid-July. Furthermore, the 2012 crop had very high starch concentrations because droughty conditions were relieved in much of the state during the tasseling/silking period from mid-July on. Consequently, the 2012 corn silage crop was short in stature but had a very high grain percentage, resulting in above-average quality. Nevertheless, high silage yields in 2013 will be a major priority for many dairy producers in NY.

Selection of corn silage hybrids, including relative maturity and hybrid itself, will impact silage yields as well as when the silage is harvested (some dairy farms may run out of silage in August or earlier in 2013). We evaluated 85-105 day corn silage hybrids at three locations in NY (Aurora Research Farm in Cayuga Co., Sparta Farms in Groveland Station in Livingston Co., and the T&R Center in Harford in Cortland Co.) and 106-115 day hybrids at Aurora and Sparta Farms. We arrange the hybrids in the field into 5-day relative maturity (RM) groups (i.e. 95-100, 101-105 day hybrids, etc.) and harvest a couple (Aurora) or all RM groups at a particular site when the hybrids are in the 60-70% moisture range. **When averaged over the last 8 years at Sparta Farms, there is usually about a 0.75 ton/acre average yield increase (65% moisture) with a concomitant 1.5 percentage unit increase in moisture with each 5-day increase in RM.** So when selecting hybrid RM, a corn silage producer can increase yield by 0.75 tons/acre on average but will probably have to delay corn silage harvest by about 3 days in early September or 5 days in late September, compared to a hybrid that is 5 days longer in RM.

We also take an initial 10,000-gram sample from each plot and then sub-sample to 700 grams to determine moisture and to run silage quality analyses on all four replications of each hybrid at each site. MILK2006, a spreadsheet from the University of Wisconsin, calculates milk/ton, a silage quality index, derived from ash; neutral detergent fiber (NDF); NDF digestibility (30 hr. wet chemistry in duplicate samples); and crude protein and starch concentrations (NIR) from the quality analyses. MILK2006 also calculates milk yield/acre of each hybrid by combining silage yield and milk/ton values. We recommend hybrids that have comparative milk yields of greater than 100 across the two or three sites (the average milk yield of each hybrid RM group is adjusted to 100 and hybrids within the RM group with above-average milk yield have values above 100). We list the comparative milk yields as well as comparative silage yields and milk/ton values for recommended hybrids for all of NY (Table 1). **Hybrids within each table should only be compared within RM groups. Hybrids that have been tested more than 1 year should be given more weight because they have performed above-average in more environments.**

85-90 day RM

Some growers may wish to select an early-season hybrid, if the 2012-2013 corn silage supply is short. We harvested the 85-99 day hybrids at Aurora on August 22nd (planted April 20th), on August 30th at the T&R Center (planted April 30th), and on September 5th at Sparta Farms (planted on May 3rd). All hybrids in the 85-99 day RM groups were in the 60-64% moisture range at harvest.

DEKALB hybrids (DKC38-03 GENVT2P, DKC39-07 GENVT2P, and DKC40-22 GENSS) all performed exceptionally well at most sites in 2012. Likewise, FS 3722VT3P, a very high-yielding hybrid from FS InVISION, performed well at all three testing sites in 2012. In addition, TA290-31 from T.A. Seeds performed well in 2012 for the 5th consecutive year in our trials as did RPM 269GRQ from Doebler's for the second consecutive year. The hybrids, DKC39-07 GENVT2P, DKC40-22 GENSS, and FS 3722VT3P generally had above-average NDFd concentrations, whereas DCK38-03 GENVT2P and RPM 269GRQ generally had above-average starch concentrations in 2012.

91-95 day RM

Newly-entered hybrids from T.A. Seeds, TA333-22DP; Hubner, H5084-VT3P and H5151VT3P; Healthy Herd Genetics, HHG33B12; and DEKALB, DKC43-48 GENVT3P, were high-yielding hybrids across most sites in 2012. In addition, previously-entered hybrids, DKC42-72 VT3 from DEKALB and TMF2L418 from Mycogen, are 91-95 day hybrids with proven track records in NY. In addition, a newly-entered hybrid from Pioneer, P9630AM1, yielded above average at Aurora and Sparta Farms, and had above-average starch concentrations at all locations.

96-100 day RM

Newly-entered hybrids that yielded exceptionally well in 2012 include HHG 39HF13 from Healthy Herd Genetics, HiDF3197-7 from Dairyland Seed Co., 197-67VT3P from Channel, and DKC46-20-GENVT3P from DEKALB. In addition, FS 4811VP3 from FS InVISION yielded exceptionally well for the second consecutive year in New York, and DQN3929 from Dyna-Gro, and RPM 472RR from Doebler's yielded above-average in 2012. The hybrids, HHG 39HF13, HiDF3197-7, and 197-67VT3P generally had above-average NDFd, and 197-67VT3P, FS 4811VP3, and RPM 472RR generally had above-average starch concentrations in 2012.

101-105 day RM

Newly-entered hybrids as well as previously-entered hybrids in New York performed exceptionally well in 2012. Newly-entered hybrids that yielded exceptionally well include 203-43VT3P from Channel; FS 5429VP3 from FS InVISION; and D45Q50 from Dyna-Gro. Previously-entered hybrids that yielded exceptionally well in 2012 include TA557-00F (9 years of testing in NY!) and TA545-20 from T.A. Seeds, especially at Sparta Farms. Previously-entered hybrids, HiDF3702-9 from Dairyland Seed and NK N53W-3000GT from Syngenta, yielded exceptionally well at Aurora and Harford. The hybrids, TA545-20 and D45Q50, generally had above-average NDFd concentrations and 203-43VT3P and NK N53W-3000GTgenerally had above-average starch concentrations in 2012.

106-110 day RM

Previously-entered hybrids and newly-entered hybrids performed above-average in the 106-110 day RM group in 2012. Previously-entered hybrids that yielded exceptionally well at both testing sites in 2012 include FS 5667GT3 from FS InVISION, P1498AM-R from Pioneer, and Garst 85E98-3000GT from Syngenta. Newly-entered hybrids that yielded exceptionally well at both testing sites include HHG 57C12 from Healthy Herd Genetics, TA108-00 from T.A. Seeds, and 594GRQ from Doebler's. Also, newly-entered hybrids, TA583-22DP from T.A. Seeds, performed exceptionally well at Sparta Farms; and DKC58-83 GENVT3P and DKC57-50VT3 from DEKALB and RPM 609AM1 from Doebler's performed exceptionally well at Aurora. In addition, previously-entered hybrids 209-85VT3P from Channel yielded exceptionally well at Aurora and D50VN10 from Dyna-Gro yielded well at Sparta Farms. The hybrids, FS 5667GT3 and Garst 85E98- 3000GT had high NDFd and starch concentrations at both sites. The hybrid, P1498AM-R, had high NDFd concentrations, whereas 594GRQ, TA583-22DP, DKC57-50VT3, and 209-85VT3P had high starch concentrations at both sites.

111-115 day RM

We only had 4 entries in the 111-115 day hybrid RM in 2012, which was surprising because we have had three consecutive years with above-average growing degree days and late frosts. The previously-entered hybrids, 214-VT3P from Channel and V5294HXTNRS from Dyna-Gro, yielded exceptionally well at Aurora in 2012. The hybrid 214-VT3P had high starch concentrations at both sites in 2012.

Conclusion

Hybrid selection is one of the most important management practices that affect corn silage yield and quality. Dairy producers must select the best adapted hybrid for their region to maximize high-quality corn silage in the ration, especially with the current high corn prices. We urge seed companies to enter their hybrids in our corn silage hybrid testing program so New York dairy producers can make informed decisions, based on tests under NY environmental conditions. You can access the detailed 2012 Corn Silage Hybrid Report at our Web site, www.fieldcrops.org.

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Table 1. Recommended 85-115-day corn silage hybrids in New York based on tests in Cayuga Co. (Aurora Research Farm), Cortland Co. (T&R Center in Harford) and Livingston Co. (Sparta Farms in Groveland Station).

Brand/Co.	Hybrid	Comp. Silage Yield	Comp. Milk/Ton	Comp. Milk Yield	Yr in Test
		----------	---------- %	----------	
	85-90 day Relative Maturity				
DEKALB	DKC38-03 GENVT2P	107	102	109	1
FS InVISION	FS 3722VT3P	107	102	109	1
T.A. Seeds	TA 290-31	105	102	107	5
DEKALB	DKC39-07 GENVT2P	103	101	104	1
Doebler's	RPM 269GRQ	101	101	103	2
DEKALB	DKC40-22 GENSS	100	103	103	2
Doebler's	RPM 472RR	101	102	102	2
	91-95 day Relative Maturity				
T.A. Seeds	TA333-22DP	109	101	110	1
Hubner	H5084VT3P	108	100	107	1
Hubner	H5151VT3P	109	97	106	1
Healthy Herd Gen.	HHG 33B12	106	99	104	1
DEKALB	DKC43-48 GENVT3P	105	100	104	1
DEKALB	DKC42-72 VT3	101	103	102	2
	96-100 day Relative Maturity				
Healthy Herd Gen.	HHG 39HF13	110	99	109	1
Channel	197-67VT3P	104	103	107	1
Dairyland Seed Co	HiDF3197-7	108	99	107	1
FS InVISION	FS4811VP3	104	101	106	2
Dyna-Gro	DQ39N29	101	104	104	1
DEKALB	DKC46-20 GENVT3P	104	100	103	1
Doebler's	RPM 472XRR	101	102	102	2
	101-105 day Relative Maturity				
Channel	203-VT3P	102	104	106	1
T.A. Seeds	TA545-20	104	102	106	3
T.A. Seeds	TA557-00F	105	101	106	9
Dairyland Seed Co	HiDF3702-9	103	102	105	2
FS InVISION	FS 5429VP3	103	102	105	1
Syngenta	NK N53W-3000GT	103	100	104	2
Dyna -Gro	D45Q50	103	101	104	1
Mycogen	TMF2L533	108	96	104	3
Hubner	H5222VT3P	101	102	103	1
Syngenta	Garst 87P52-4011	101	101	102	1
Syngenta	NK N45P-4011	100	101	101	1

Table 1. continued on next page.

Table 1 continued. Recommended 85-115-day corn silage hybrids in New York based on tests in Cayuga Co. (Aurora Research Farm), Cortland Co. (T&R Center in Harford) and Livingston Co. (Sparta Farms in Groveland Station).

Brand/Co.	Hybrid	Comp. Silage Yield	Comp. Milk/Ton	Comp. Milk Yield	Yr in Test
		----------------------	----------%----------	----------------------	
		106-110 day Relative Maturity			
FS InVISION	FS 5667GT3	104	104	108	2
Channel	209-85VT3P	104	101	105	2
Syngenta	Garst 85E98-3000GT	101	104	105	2
T.A. Seeds	TA583-22DP	102	103	105	1
T.A. Seeds	TA108-00	104	100	104	1
Doebler's	Doebler 594GRQ	102	101	103	1
Pioneer	P0210AM-R	100	103	103	2
DEKALB	DKC58-83 GENVT3P	102	101	103	1
Healthy Herd Gen.	HHG 57C12	107	96	103	1
DEKALB	DKC57-50VT3	101	102	103	1
Pioneer	P1498AM-R	102	101	102	2
Doebler's	RPM 609AM1	103	99	101	1
Dyna-Gro	D50VN10	102	100	101	2
Hubner	H5333VT3P	100	103	101	1
		111-115 day Relative Maturity			
Channel	214-VT3P	105	101	106	3
Dyna-Gro	V5294HXTRNS	105	99	104	2

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Perennial Grass Cultivar Evaluation

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Many new perennial grass cultivars are released each year. In general, there may be some information available regarding potential yield, but almost no information on potential forage quality. The few grass cultivar trials around the Northeast that rely on entries paid for by seed companies result in comparison of a few entries, and most may be experimental lines, not cultivars. There is also a concern that forage quality of cultivar entries harvested on the same date are biased by the maturity rating of the cultivars, giving advantage to later heading varieties.

Perennial grasses are a major forage source in the Northeast, both in pure stands and in mixture with alfalfa. There were few choices in the past, but many cultivars are now available. Comparative evaluation of cultivars is confounded with cultivar maturity differences. As the number of available perennial grass cultivars expands, an effective method of comparing cultivars becomes increasingly important. This is particularly true in the Northeastern USA, where cool-season perennial grasses are a significant portion of the forage base on dairy farms. A range in cultivar yield potential is certainly available, but it is not clear if there have been any significant advances in forage quality among grass cultivars. We chose tall fescue for an evaluation of cultivars, because there are so many cultivars available, with over 100 forage-type (not turf-type) cultivars.

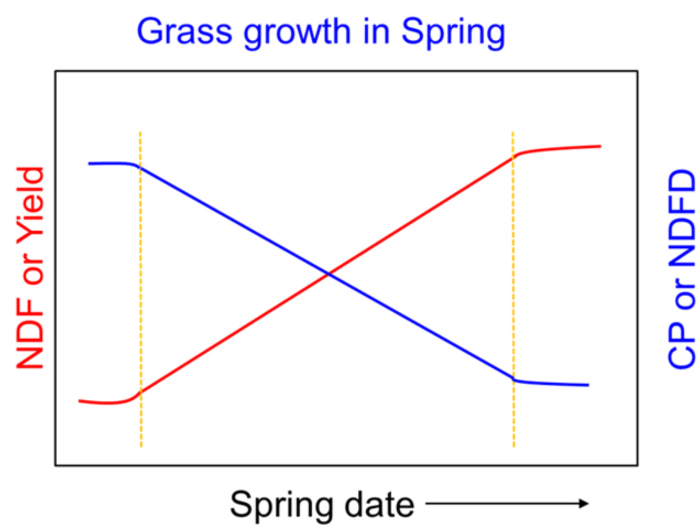

Figure 1. During mid to late May in a typical year, NDF and yield increase linearly, while CP and NDFD decrease linearly.

Harvest at optimum NDF

Harvesting forage grasses to optimize fiber content for the class of livestock being fed results in neutral detergent fiber (NDF) as the most useful harvest date target. An ideal cultivar evaluation system for perennial grasses should be capable of evaluating each entry at time of optimum NDF content. So our first goal was to develop a method for comparing quality of cultivars at spring harvest (Cherney et al., 2011). Comparative evaluation of cultivars for yield and quality is confounded with cultivar maturity differences if all cultivars are harvested on the same day; harvesting on different days at a similar morphological stage confounds quality with day-to-day environmental fluctuations. Our goal was to develop a system to adjust quality of each cultivar to the date of optimum NDF content for harvest.

Fiber digestibility at optimum NDF

We have determined that NDF, fiber digestibility (NDFD) and yield all change linearly over time during a 3-week period usually starting about May 10 in Ithaca (Fig. 1). So if we sample cultivars at several dates, we can determine the rate of change per day. Once we know the rate of change per day for NDF and NDFD, we can adjust NDFD to the date that each cultivar reaches optimum NDF, or for a variety trial we can adjust NDFD of all cultivars to the mean NDF of the trial. This provides a means of comparing all cultivars with minimum bias.

Tall Fescue cultivar trials

We harvested tall fescue cultivar trials in Ithaca and Chazy, NY in 2012, with 40 cultivars in each trial. Heading dates were determined as the date when 5 heads were visible in a plot, roughly corresponding to a late boot stage maturity. Spring growth was relatively abnormal, with half of the cultivars in the Ithaca trial heading by May 11, with low yields. The Ithaca trial was harvested on May 11, and three more times in 2012. The Chazy trial was harvested May 18, and two more times in 2012. A separate set of plots was used for periodic spring sampling, to determine daily rates of change for NDF and NDFD. These rates were used to adjust NDFD of each cultivar to the mean NDF of all cultivars at spring harvest (55% NDF for Ithaca, 50% for Chazy). Rates of change of NDF and NDFD at both sites were approximately one percentage unit per day, with NDF increasing one unit per day and NDFD decreasing one unit per day.

Table 1. Tall Fescue Cultivar Trials, 2012 yields and heading dates.

Ithaca	**4 harvests**	**Heading Date**	**Chazy**	**3 harvests**	**Heading date**
Cultivar	**Tons DM/a**	**May**	**Cultivar**	**Tons DM/a**	**May**
Kora	6.25	9	Stockman	4.34	20
Jesup Max Q	5.98	7	Duramax Armor	4.28	19
Stockman	5.84	13	Festival	4.18	18
Atlas	5.80	7	Barduram	4.13	22
Teton	5.80	7	Tower	4.04	22
Duramax	5.78	8	Cajun II	4.03	17
Tuscany II	5.76	9	Tuscany II	3.92	19
Martin 2	5.73	8	Bronson	3.91	16
Tower	5.66	15	Fuego	3.88	17
Seine Happe	5.61	13	Rustler	3.86	18
Barduram	5.59	14	Montebello	3.86	19
Rustler	5.59	9	BarOptima PLUS E34	3.84	21
Festival	5.58	9	Atlas	3.83	16
Montebello	5.58	12	Duramax	3.81	15
Jesup L	5.55	9	Jesup Max Q	3.80	16
KY-31	5.53	7	Kora	3.79	19
Seine	5.51	9	Enforcer	3.76	19
Goliath	5.51	9	Teton	3.76	15
Kentucky 32	5.50	9	Seine	3.68	19
Au Triumph	5.48	5	Barcel	3.67	21
Orygun	5.45	7	Enhance	3.65	16
Fuego	5.39	15	Savory	3.65	19
Bronson	5.37	9	Goliath	3.63	18
Hymark	5.36	9	Martin 2	3.62	17
Enforcer	5.36	13	Jesup L	3.60	17
Cajun II	5.34	9	Seine Happe	3.60	19
Bull	5.31	9	Bariane	3.54	24
Martin 2 647	5.31	9	Orygun	3.51	17
Duramax Armor	5.28	8	Au Triumph	3.49	14
Fawn	5.26	6	Tower 647	3.46	21
Ranger	5.21	9	Bull	3.46	16
Enhance	5.18	8	KY-31	3.41	15
Tower 647	5.18	15	Hymark	3.39	17
BarOptima PLUS E34	5.13	15	Siberia	3.32	21
Siberia	5.10	16	Kentucky 32	3.26	17
Barcel	4.98	13	Fawn	3.23	14
Courtenay	4.97	17	Courtenay	3.20	21
Advance	4.84	8	Martin 2 647	3.15	16
Savory	4.80	9	Advance	3.14	19
Bariane	4.69	18	Ranger	3.10	19
Mean	**5.43**	**10**	**Mean**	**3.67**	**18**
LSD 0.10	**0.79**		**LSD 0.10**	**0.47**	
Harvest dates: May 11, June 6, July 27, Oct. 22			Harvest dates: May 18, June 13, Oct. 9		

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Table 2. Tall Fescue Cultivar Trials, 2012 NDF and adjusted NDFD.

Ithaca	NDF on	Adjusted		Chazy	NDF on	Adjusted
Cultivar	**11-May**	**NDFD**		**Cultivar**	**18-May**	**NDFD**
Courtenay	52.8	73.7		Savory	50.0	76.3
Kentucky 32	55.6	73.6		Kentucky 32	51.1	76.2
Festival	56.0	73.3		Courtenay	48.4	75.9
Enhance	55.4	72.8		Kora	50.2	75.2
Stockman	56.1	72.7		BarOptima PLUS E34	49.8	75.2
Tuscany II	55.8	72.4		Siberia	47.7	75.0
Jesup L	56.0	72.2		Festival	50.2	75.0
BarOptima PLUS E34	55.2	72.1		KY-31	51.0	75.0
Rustler	54.2	72.0		Bariane	47.8	74.5
Kora	55.3	71.9		Atlas	52.5	74.4
Martin 2 647	56.9	71.7		Ranger	49.6	74.4
Bariane	54.1	71.3		Goliath	49.7	74.3
Duramax Armor	55.3	71.3		Enforcer	49.2	74.1
Bronson	57.0	71.3		Hymark	51.5	74.1
Hymark	55.1	71.0		Orygun	53.0	74.1
Barcel	54.1	71.0		Duramax	50.0	74.0
Jesup Max Q	56.4	70.9		Jesup Max Q	51.5	73.9
Duramax	55.8	70.4		Barcel	48.2	73.8
KY-31	54.4	70.3		Stockman	49.4	73.8
Martin 2	56.0	70.3		Fuego	48.7	73.5
Enforcer	51.0	70.2		Advance	47.5	73.4
Cajun II	56.2	70.2		Cajun II	50.4	73.4
Barduram	54.0	70.2		Tuscany II	49.3	73.4
Ranger	55.9	70.1		Jesup L	48.8	73.2
Siberia	53.4	69.6		Seine	51.2	73.1
Seine	55.3	69.4		Montebello	49.7	73.0
Tower	55.3	69.4		Barduram	49.4	73.0
Seine Happe	55.3	69.3		Seine Happe	50.7	73.0
Goliath	54.7	69.0		Au Triumph	51.8	72.9
Atlas	56.7	68.9		Fawn	50.6	72.9
Orygun	57.6	68.7		Martin 2 647	50.0	72.6
Fuego	51.9	68.7		Bronson	52.1	72.5
Savory	56.5	68.6		Duramax Armor	50.6	72.4
Advance	52.8	68.3		Bull	52.4	72.3
Montebello	54.5	68.1		Tower 647	48.8	72.2
Fawn	55.1	68.0		Martin 2	50.8	72.1
Tower 647	55.5	67.9		Tower	49.5	72.0
Teton	56.1	67.9		Teton	50.9	71.8
Bull	57.1	67.9		Enhance	50.9	71.8
Au Triumph	55.4	66.2		Rustler	49.0	71.4
Mean	**55.2**	**70.3**		**Mean**	**50.1**	**73.6**
LSD 0.10	**1.42**	**3.43**		**LSD 0.10**	**1.69**	**2.25**

Yield

Yields were more variable than normal, in part due to a very abnormal early warm spring growing season followed by very dry conditions (Table 1). Although spring yields were very low, yields for the entire season were reasonable. Yield distribution for 4-cuts at Ithaca was 23, 31, 27, and 19%, for cuts 1-4 respectively, and for 3-cuts at Chazy it was 22, 30, and 48%. With 4-cuts at Ithaca, 80% of the yield was sufficient quality for lactating dairy cows (cuts 1-3), while only about half of the total yield at Chazy was lactating dairy quality forage. Fall-cut grass is always very low in CP and digestibility, even though NDF is typically low, and it is usually considered dry cow or heifer feed. Yield distribution in 2012 was skewed, with an abnormally high percentage of the yield produced later in the season. Overall, it was a very unusual year for grass growth.

Quality

Due to very warm weather in March, 2012, perennial grass matured one to two weeks earlier than normal. Tall fescue headed as early as May 5 in Ithaca, and May 14 in Chazy, resulting in a an average NDF of 55% on May 11 in Ithaca, and 50% on May 18 in Chazy, at spring harvest (Table 2). Abnormal weather, combined with somewhat less than ideal stands, resulted in relatively high variability for both yield and quality at both sites. The rate of change of both NDF and NDFD was approximately one unit per day. NDFD was adjusted to a common NDF (average NDF of the trial) at each site. For example, if a cultivar at Ithaca was 58% NDF and 70% NDFD at harvest, then NDFD was adjusted by 3 days (58% down to 55% NDF), making the adjusted NDFD 73%. With NDFD of all cultivars adjusted to a common NDF, they are all on a more comparable basis.

Although there was a relatively large range in heading date among cultivars, range in NDF among cultivars at spring harvest was only 7 percentage units at Ithaca and 6 percentage units at Chazy. So NDFD adjustments were relatively minor. Range in adjusted NDFD was relatively small, suggesting little improvement in NDFD among newer tall fescue cultivars.

Heading may not be a good indicator of forage quality

Another possible adjustment is to adjust both NDF and NDFD to the heading date for each cultivar. This was calculated for Ithaca in Table 3. There was a 10 percentage unit range in NDF at heading, and a 13 percentage unit range in NDFD at heading, among cultivars. Both the NDF and NDFD at heading are highly correlated with the actual heading date, with correlations of 0.88 and -0.75 for NDF and NDFD. In addition, NDF at heading is highly negatively correlated (r = -0.85) with NDFD at heading.

We can determine the relationship between heading date and spring NDF or NDFD at harvest. We also have the rate of change of NDF and NDFD in spring growth. By combining this information, we can make a rough estimate of the change in NDF or NDFD per day that is due to maturity (heading date), versus the change in NDF or NDFD per day due to plant age. For Ithaca, about 25% of the NDF change per day was due to cultivar heading date, and this value was 40% for the Chazy trial. For Ithaca, about 34% of the NDFD change per day was due to heading date, and this value was 52% for Chazy.

Using these estimates for Ithaca data, if cultivar A heads 10 days earlier than cultivar B, then A would be only about 2.2% units higher in NDF and 3.9% units lower in NDFD than B, when harvested on the same date. Any quality differences between cultivars A and B due to a 10-day difference in heading date could be eliminated by harvesting the early heading cultivar 4 days before the late heading cultivar. Heading date has some influence on quality, but plant age (day of year) is equally important. Grass quality continues to decline with age, whether heading is delayed or not.

Summary

- Spring heading date of a cultivar had very little effect on total seasonal yield.
- There was no relationship between total seasonal yield and spring adjusted NDFD.
- Both NDF and NDFD in tall fescue spring growth are controlled as much or more by plant age (day of year) than they are by morphological maturity (heading date).
- The strong negative relationship between NDF at heading and NDFD at heading implies that there have not been significant advances in breeding for higher NDFD in tall fescue.
- The relatively narrow range in adjusted NDFD (adjusted to the trial average NDF) also suggests that there have not been significant advances in breeding for NDFD.
- It is possible that the unusual spring weather in 2012 affected some of the relationships above; this will be clarified in 2013.

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Conclusions

- If choosing a fescue cultivar for a pure stand, look for high yield and high adjusted NDFD (adjusted to trial average NDF) at spring harvest.
- Choosing a fescue cultivar based on heading date, in order to better match up with alfalfa may have less impact on overall forage quality at harvest than commonly believed.
- In a mixed stand, most producers are looking for a high proportion of alfalfa, with the highest possible NDFD for the grass at harvest. High grass yield potential may not be desirable, as this likely indicates a more competitive grass. Harvest date is usually based on alfalfa maturity, not on the grass. Therefore, if choosing a fescue cultivar to seed with alfalfa, select a cultivar with high NDFD at spring harvest. The selection may or may not be a late maturing cultivar.
- These conclusions probably apply to the other cool-season grass species.

Reference for adjustment of grass quality: Cherney, J.H., D. Parsons, and D.J.R. Cherney. 2011. A method for forage yield and quality assessment of tall fescue cultivars in the spring. Crop Sci. 51:2878-2885.

Acknowledgments: Thanks to the Northern New York Agricultural Development Program for supporting this project.

Table 3. Tall Fescue NDF and NDFD at heading in Ithaca.

Ithaca Cultivar	NDF at heading		Ithaca Cultivar	NDFD at heading
Au Triumph	50.0		KY-31	75.7
Advance	50.1		Enhance	75.7
Fawn	50.5		Rustler	75.3
KY-31	50.7		Kentucky 32	75.1
Rustler	52.4		Advance	74.5
Teton	52.5		Duramax Armor	74.3
Duramax Armor	52.6		Festival	74.2
Enhance	52.7		Kora	73.8
Enforcer	52.8		Tuscany II	73.7
Jesup Max Q	52.8		Jesup Max Q	73.6
Goliath	52.9		Fawn	73.6
Atlas	53.1		Jesup L	73.3
Duramax	53.1		Hymark	73.2
Martin 2	53.3		Enforcer	73.1
Hymark	53.3		Duramax	72.8
Kora	53.5		Au Triumph	72.6
Seine	53.5		Martin 2	72.4
Kentucky 32	53.8		Goliath	71.7
Orygun	53.9		Martin 2 647	71.6
Tuscany II	54.0		Seine	71.4
Ranger	54.1		Atlas	71.3
Jesup L	54.2		Ranger	71.3
Festival	54.2		Teton	71.1
Cajun II	54.4		Cajun II	71.0
Savory	54.6		Bronson	71.0
Martin 2 647	55.1		Orygun	70.1
Bronson	55.2		Barcel	69.9
Bull	55.3		Courtenay	69.6
Montebello	55.4		Stockman	69.0
Fuego	55.6		Savory	69.0
Barcel	55.9		Barduram	68.0
Barduram	56.7		Fuego	68.0
Seine Happe	57.1		Montebello	67.6
Siberia	57.9		Bull	67.5
Stockman	57.9		BarOptima PLUS E34	67.2
Courtenay	58.2		Seine Happe	66.6
BarOptima PLUS E34	58.9		Siberia	65.9
Tower	59.0		Bariane	64.4
Tower 647	59.1		Tower	64.4
Bariane	60.5		Tower 647	62.7

Recommended Roundup Ready Soybean Varieties For Central/Western New York

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Crop Management

Soybean acreage continues to expand in New York with over 300,000 acres projected to be harvested in 2012 at an average yield of 45 bushels/acre. Variety selection is a key management decision that affects soybean yield because soybeans require a limited number of inputs. Growers should gather as much information as possible on variety selection because of its importance in optimizing profit for the 2013 growing season.

The varieties in Table 1 are recommended varieties for central/western New York, based on tests in Cayuga (Aurora Research Farm) and Livingston Co (Neenan Brothers Farm in Lima). We also have tests in Northern New York (Sackets Harbor in Jefferson Co. and the Miner Institute in Clinton Co.) but we have only harvested one of the sites at this time so we will publish our recommended varieties for Northern New York in a subsequent issue. We recommend varieties that have average relative yields of more than 100% across the three sites (100% relative yield equals the mean yield of the test). **Recommended varieties, which have been tested more than one year, have performed well over different growing seasons in NY so more consideration should be given to those varieties. When looking at relative yields in Tables 1, only compare relative yields of varieties within a Maturity Group**. In general, Group II varieties yield about 5 bushels/acre or 5 to 10% more than Group I varieties but Group II varieties have yielded 10-15% more than Group I varieties over the last couple of growing seasons because August and September rains have benefited later-maturing varieties more.

GROUP I

When averaged across the Group I tests at Aurora and Lima in 2012, previously-entered varieties in New York including 13A11 from GROWMARK FS, SG1513 and SG1911 from Seedway, 1805R2 from Channel, RPMDB1212 from Doebler's, and S17-G8 from Syngenta continued to yield exceptionally well. Also, newly-entered varieties, 15A11 from GROWMARK FS and 5N180RR2 from Mycogen, yielded exceptionally well in 2012. The Group I varieties (16 entries) averaged 7 bushels/acre lower than the Group II varieties (27 entries) at Aurora and 8 bushels/acre lower at Lima in 2012.

GROUP II

When averaged across the Group II tests at Aurora and Lima in 2012, the newly- entered variety 20A12 from

Table 1. Relative yields of recommended Group I and Group II Roundup Ready soybean varieties for central/western New York based on tests in Cayuga and Livingston Co. over the last few years.

VARIETY	COMPANY/BRAND	RELATIVE YIELD (%)	YEARS IN TEST
		GROUP I VARIETIES	
1805R2	Channel	108	2
S17-G8	Syngenta	107	2
15A11	GROWMARK FS	106	1
SG1513	Seedway	106	1
13A11	GROWMARK FS	104	2
5N180RR2	Mycogen	104	1
RPMDB1212	Doebler's	103	2
SG1911	Seedway	102	2
		GROUP II VARIETIES	
20A12	GROWMARK FS	111	1
S20-Y2	Syngenta	107	2
21A12	GROWMARK FS	106	2
31RY20	Dyna-Gro	105	2
5N210RR2	Mycogen	105	1
TS2229R2	T.A. Seeds	105	1
S21-N6	Syngenta	104	7
SG2111	Seedway	103	2
SG2013	Seedway	103	1
S28-K1	Syngenta	103	1
2305R2	Channel	101	2
RPMDB2612	Doebler's	101	1

GROWMARK FS yielded the highest. Previously-entered varieties, S20-Y2 from Syngenta, 31RY20 from Dyna-Gro, 21A12 from GROWMARK FS, S21-N6 from Syngenta, and SG2013 from Seedway, yielded exceptionally well. Other newly- entered varieties that performed exceptionally well include 5N210RR2 from Mycogen, TS2229R2 from T.A. Seeds, and SG2111 from Seedway. A newly-entered variety, S28-K1 from Syngenta, yielded exceptionally well at Lima as did the previously-entered varieties, 2305R2 from Channel, RPMDB2612 from Doebler's, and SG2410 from Seedway.

CONCLUSION

Variety selection strongly influences yield and subsequent profit. Commercial varieties in the same maturity group have significant yield differences, lodging tolerance, and harvest moistures if harvesting during the initial dry-down phase. Consequently, soybean variety selection greatly impacts harvesting efficiency, yield, potential drying costs, and ultimately profit so growers should consider all sources of information when selecting varieties. We provide yield, moisture, and lodging data in our 2012 New York State Soybean Variety Test Report (as well as reports from previous years), posted on our Web site, www.fieldcrops.org.

Survey of Cover Crop Use on New York Dairy Farms

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Nutrient Management

Introduction

Many dairy farmers include cover crops in their crop rotations. Cover crops help to reduce erosion and nitrate leaching loss, increase soil organic matter, and supply nitrogen (N) for crops that follow. In this study, New York dairy farmers were surveyed to determine current cover cropping practices, identify reasons for using or not (or no longer) using cover crops, and to determine cover crop research needs.

Farmer Surveys

Two surveys were targeted to (1) corn growers with experience growing cover crops, and (2) growers who had never used cover crops. Along with some basic farm information, the heart of the survey focused on cover crop practices. Farmers with cover crop experience were asked about the types of cover crops they plant, seeding rates, seed cost per acre, number of acres in each crop, and whether the cover crop is typically harvested (double cropping with harvest for forage, straw or grain/seed). Additional questions asked about method of planting, where seed was purchased, and whether having a cover crop in the corn rotation impacted manure, pest or tillage management, farm fuel needs, and/or farm income. Farmers with cover crop experience were asked to rank their top five reasons for planting cover crops. Farmers that did not have experience with cover crops were asked why they had not planted cover crops and whether cost-sharing availability would entice them to plant cover crops in future years. In the third section of both surveys, questions were asked about access to information on cover crop selection, use and management. Both surveys concluded with an open ended request to list research priorities. Surveys were conducted across New York from March 2009 to September 2011. Contacts were made through Cornell Cooperative Extension (CCE) meetings, Empire Farm Days, personal communication, and through a crop consulting company. In total, 115 surveys were completed representing 26 counties. Of these surveys, 63% were completed by farmers with cover crop experience. Participation in the survey was voluntary and there were no specifications to participate other than being involved with a dairy farm that grows corn in New York State.

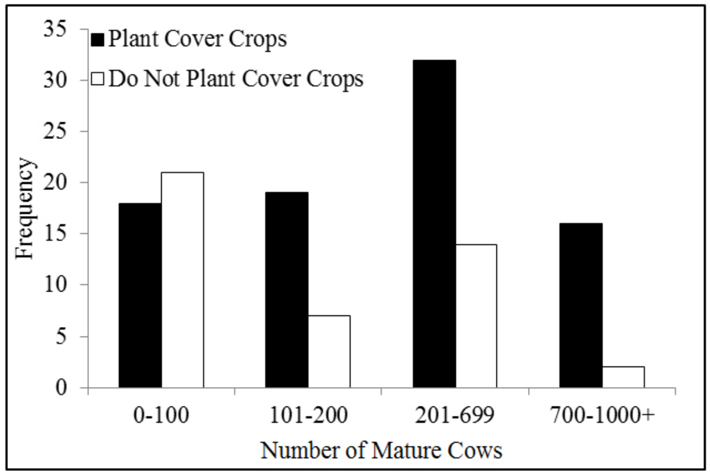

Figure 1: Frequency of cover crop use on dairy farms of different numbers of mature cows.

Main Findings

Farm Characterization

In our survey population of 115 farms, the average acreage of farms that used cover crops was 982 acres; double that of farms that did not grow cover crops (Table 1). On average, farms with cover crops had 517 mature cows and an animal density of 1.06 animal units per acre, versus 242 mature cows and an animal density of 0.93 animal units per acre for those without cover crop experience.

Table 1: Summary of background information on all farms surveyed.

	Units	Use cover crops	Do not use cover crops
Number of surveys		73	42
Acres of tilled land	Acres	982	493
Number of milking/dry cows (average)	Cows	517	242
Number of milking/dry cows (median)	Cows	197	104
Number of calves/heifers	Cows	529	199
Animal density (average)*	Animal units/acre	1.06	0.93
Animal density (median)*	Animal units/acre	0.86	0.71
Acres of corn silage	Acres	380	203
Acres of corn grain	Acres	246	199
Acres of alfalfa/grass hay	Acres	437	259

*Assumes 1.4 AU per mature cow and 0.6 AU per calf/heifer (American Society of Agricultural Engineers, 2004 and Midwest Plan Service, 1993).

In New York, Concentrated Animal Feeding Operations (CAFOs) (>200 mature animals) with fields that are prone to leaching are required to implement cover cropping if manure is to be applied to those

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fields in the fall. While the N leaching index requirement for cover crops impacts relatively few acres, it appears that farmers have seen the benefits of cover cropping and many dairies, large and small, are implementing them voluntarily across many acres (Figure 1).

Farms that use cover crops

In total, 73 dairy farmers with cover crop experience completed the survey, including six who farm organically. In most cases, corn silage comprised about half of the tillable acreage with alfalfa or grass on the remaining acreage. Fifty percent of the farms planted cover crops on at least 42% of their corn silage acreage. Farms that grew more corn silage had larger acreages of cover crops than farms that grew more corn for grain. This is not surprising because in field crop systems in New York, fall cover crop establishment is often difficult after corn grain harvest due to a short period left in the growing season after harvest. No farm grew cover crops on all of its tillable acreage; across all participant farms, an average of 19% of the total tillable acreage was in cover crops and 48% of the total corn acreage was in cover crops.

Many farmers surveyed had been using cover crops for less than 5 years (47%) while another 35% of the farmers had more than 10 years of experience with cover crops. The most common cover crop planted was winter/cereal rye (Table 2). Other cover crops included wheat, oats, triticale, barley, tillage radish, and spelt. Farmers that grew triticale for a cover crop were most likely to harvest it: 75% of those that planted triticale harvested it (Table 2).

The majority (69%) of farmers who used cover crops planted them on both rented and owned land. Broadcasting was the most common method of planting cover crops (63% of total responses). A significant majority of farmers planted their own cover crops (76%) while 24% hired custom operators to do the job. Most farmers (86%) bought their seed from a retailer, as opposed to obtaining seed from other farmers or saving their own seed. Most farmers who used overwintering cover crops killed them through tillage (64%). Many terminated overwintering cover crops using chemicals (32%) and a few farmers used a roller crimper (2%).

Almost two thirds of the farmers (64%) did not adjust N fertilizer rates for corn after the cover crop and 69% reported not having seen a change in yield of the corn crop following the cover crop. This may reflect abundance in N availability, but side by side comparisons are needed to evaluate whether cover crops impact N need for the corn crop that follows. Farmers primarily used cover crops for the purpose of soil conservation, although the importance of cover crops for organic matter and manure nutrient management was identified as well (Table 3). In personal conversations with farmers, several considered oats to be a cover crop when companion planted with a new seeding of alfalfa, but because the survey focused on overwintering cover crops, additional information on this crop option was not captured. Of all 73 farmers with cover crop experience, only 10 were not currently using cover crops. Of

Table 2: Types of overwintering cover crops grown on farms. Percent harvested represents the percent of farms that also harvested that crop.

	Planted		Harvested		Number of farms harvesting for*		
Type of cover crop	Farms	%	Farms	%	Animal feed	Grain	Other/Unidentified
Winter/Cereal rye	46	63	16	35	12	6	14
Ryegrass	8	11	1	13	1	0	0
Winter wheat	18	25	9	50	3	0	6
Triticale	8	11	6	75	0	1	6
Red clover	6	8	2	33	2	0	0
Hairy vetch	2	3	1	50	0	0	1

*Number can exceed more than total number of farms harvesting the particular crop because farms had the option to check more than one purpose.

Table 3: Reasons farmers began using cover crops.

Reasons for growing cover crops	Number of Farms					Total Farms
Ranking of Importance	1	2	3	4	5	
Soil conservation	33	16	3	2	1	55
Nitrogen holding/catch crop for manure N	2	18	7	5	0	32
Certified organic	2	1	1	0	0	4
Meeting Leaching Index requirement	1	1	3	3	1	9
Fulfill cost share requirement	6	7	2	0	0	15
Improve trafficability	0	1	3	3	1	8
Improve organic matter	11	9	9	5	4	38
Weed control	4	3	5	3	4	19
Allows for manure spreading year round	1	3	7	5	5	21
Other	8	2	4	2	3	19

these 10 farmers, 5 reported they had stopped using cover crops because it required too much time while 4 listed a delay in corn planting as the reason for discontinuing use of cover crops as part of the rotation. Others reported that it was too costly, they could not kill the cover crops with their current tillage method, and/or weather conditions had not been favorable for planting after corn silage harvest in the fall.

Farms that do not use cover crops

On average, the 42 farmers that did not have any experience with growing cover crops operated 493 acres of tillable land of which 30% was planted in corn for silage. The most common tillage system used was conventional tillage (49% of respondents). Of the farmers who did not use cover crops, 43% stated that they would be willing to spend up to $25/acre on cover crops. Almost two-thirds (72%) of the farmers stated they would plant cover crops if sufficient cost sharing were available to them.

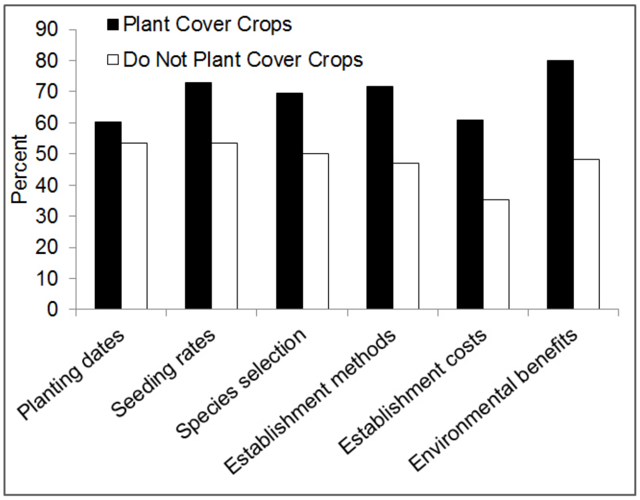

Figure 2: Percent of farmers who have been able find New York State-specific information on various topics regarding cover crops.

Table 4: Desired cover crop characteristics by farmers without experience with cover crops

Characteristic	Number of farms*	Percent
Erosion control	1	1.9
Fall residue cover	15	28.8
Spring residue cover	10	19.2
Nitrogen fixation	19	36.5
Winterkill	4	7.7
Other	3	5.8

*Number exceeded the total number of farms (52) because farms had the option to check more than one characteristic.

The cover crop characteristic most desired by farmers without experience in their use was N fixation, followed by fall residue and spring residue supply (Table 4). Farmers who responded “other” mentioned that a cover crop could help with weed control and increase organic matter in the soil. This is in contrast with the motivation of farmers with cover crop experience who reported soil conservation as the main reason for cover crop use (Table 3).

The most common reason for not using cover crops was lack of time. This was followed by perceived high costs of planting cover crops and not knowing enough about them to make an informed decision. Other reasons included weather issues, and the opinion that their farm did not need to plant them.

Research and extension needs

Farmers who had experience with cover crops reported that they had been able to find New York specific information, more so than farmers who had never planted cover crops (Figure 2). Many farmers had research questions, ranging from effectiveness of use of cover crops to manage N and impact on organic matter and soil health, to establishment guidance for New York soil and growing conditions, and overall economics. There were also questions about specific crops, particularly radishes and turnips, as well as legumes.

Summary and Conclusions

Farmers without experience with cover crops indicated that cover crops would take too much time and be too costly to include in their rotation. However, many of these farmers were interested in learning more about integrating cover crops into their cropping systems. The few farmers who had experience with cover crops that had abandoned the practice in recent years stated that cover crops took too much time and delayed the planting date for the crop following the cover crop. All other respondents, however, identified benefits of using cover crops, primarily for soil conservation. Farmers with cover crop experience typically planted winter/cereal rye. Other cover crops included wheat, oats, triticale, barley, tillage radish, and spelt. Oats (winterkilled) and triticale (overwintering) were harvested most (forage, grain, bedding/straw, and seed).
The majority of farmers with experience planted cover

crops on both rented and owned acres, and used broadcast as an establishment method. Most farmers who used cover crops had used them for ten years or less. Many farmers had specific questions they wanted addressed through research. The questions were very diverse and ranged from using cover crops to manage N, organic matter and soil health, to questions regarding establishment in New York soil and climate conditions and economics. There were also questions about specific crops, particularly radishes and turnips, as well as legumes.

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Calendar of Events

December 12,	**2012 Field Crop Dealer Meeting, Syracuse, NY**
January 16, 2013	**Corn Congress, Batavia, NY**
January 17, 2013	**Corn Congress, Waterloo, NY**
January 24, 2013	**New York Corn and Soybean Expo, Liverpool, NY**
February 6, 2013	**Soybean & Small Grain Congress, Batavia, NY**
February 7, 2013	**Soybean & Small Grain Congress, Waterloo, NY**

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