What's Cropping Up?

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MANAGEMENT OF CORN ROOTWORM IN 2005

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Year in Review

While we are still trying to forget the struggles of farming in NY during the summer of 2004, when the sun refused to shine, the frequent rains kept the fields too wet to work and the hay crop rotted on the ground, there are some good impacts from all that wet weather. Economic damage to our corn crop from corn rootworm feeding was at a very low level during the summer of 2004. Field capacity soils during the rootworm hatching period in late May and early June reduced the larval population of rootworm by drowning them. Abundant soil moisture also allows the rootworm damaged corn plant to maintain its yield potential while the damaged plant regenerates its roots. Maximum root damage from corn rootworm occurs when the plant approaches the reproductive stage and water stresses from root damage can have a major impact on yield during this time.

Fields at Risk

Field risk for root feeding damage from corn rootworm increases as the number of years of continuous corn increases. First year corn is never at risk from corn rootworm damage although other insects can attack the corn plants. First year corn following alfalfa sod is at risk for attack from seed corn maggot however. While an insecticide is not necessary for rootworm control in 1st year corn, insecticide is required either on the seed or in the seed furrow to minimize stand losses from seed corn maggot. Second year corn fields are at low to moderate risk to damage from corn rootworm. Second year fields at particularly high risk would be corn planted into fields that were very late planted 1st year corn the previous year. Third year corn fields are at moderate to high risk to damage from corn rootworm while 4th year and greater continuous corn fields are at high rootworm risk.

Management Strategies:

Rotation

Crop rotation is still a viable and effective corn rootworm management strategy in the Northeastern US. An annual rotation of corn with an alternative non-host crop such as soybeans eliminates the need for a corn rootworm insecticide during the corn years. In addition, short rotations of corn and other crops reduces the need for rootworm control measures.

Granular Insecticides

While old technology may not be as trendy or attractive as the newest technology on the block, NY corn farmers are still receiving good returns for their rootworm control dollar with the purchase and use of granular insecticides. Research trials conducted each year in NYS indicate a continuing high level of control of corn rootworm when registered granular rootworm materials are used by farmers. Force, Lorsban and Counter continue to give excellent levels of control in soils with the PH less than 7.5. Force and Counter continue to give excellent levels of control in soils with the PH greater than 7.5. The new hot topics of EPA mandated refuges and insecticide resistance are not applicable to granular insecticides. When granular insecticides are applied according to label in a 7 inch band, the untreated soil between the rows act as a refuge to protect against corn rootworm developing resistance to the granular insecticides. If you have granular insecticide boxes on your corn planter, check with your pesticide supplier to see if the choice of granular insecticides gives you the best return for your rootworm control dollar.

Granular insecticides are best targeted at fields with moderate to high populations of corn rootworm. Since second year corn has a low to moderate risk for rootworm feeding damage, these fields would be a good place for less than label rates of soil insecticide. If less than label rates are considered, careful calibration of the insecticide applicators is extremely important. Excellent control can often be experienced with 66% of the full label rate. Full label rates should be used in high risk fields.

Seed Treatments

The new seed treatment technology is a great new innovation in the delivery of insecticides to the needed action site while minimizing handler exposure to the insecticide. However, since different rates are marketed, extreme care needs to be taken to make sure the proper rate of insecticide is applied to the seed for the desired pest complex.

Get the Rate Correct! Since both Cruiser and Poncho are closely related compounds, the same rate recommenda-

Pest Management

tion applies to both compounds.

Secondary insect pests (seed corn maggot, wireworm etc): 0.25 mg/seed
(Poncho 250 or Cruiser Extreme Pak 0.25)

Corn rootworm: 1.25 mg/seed.
(Poncho 1250 or Cruiser Extreme Pak 1.25)

Both Poncho and Cruiser provide adequate control of low to moderate populations of corn rootworm at the rates listed above. The lower application rate targeted at the secondary insects like seed corn maggot will not provide adequate control of corn rootworm. (Table 1). Since both products are systemic in action and are very closely related chemically, the potential for corn rootworm to develop resistance to these compounds is very high. The systemic nature of these compounds removes the in-field refuge. It is the presence of the in-field refuge with granular insecticides which have prevented the development of insecticide resistance in corn rootworm for the past 40+ years usage of the granular materials.

YieldGard – Rootworm

Varieties containing the BT gene active on corn rootworm (YieldGard-Rootworm) continue to perform better than either granular insecticides or the insecticide seed treatments in terms of limiting rootworm feeding damage (Table 1). However, a higher level of root feeding damage was observed in the 2004 field trials than in previous years. Reports out of University trials in Illinois report incidences of severe root damage from rootworm feeding in varieties reported to contain the BT-rootworm gene. It is unclear at this point if the affected varieties had a lower level of BT than previous years or if there was a sudden appearance of BT resistance in the Illinois population of corn rootworm.

Refuge Requirements

If a grower decides to plant a corn variety containing the BT-rootworm gene (YieldGard-Rootworm), a refuge equaling 20% of the acreage of the BT-rootworm planting must be planted. The refuge must be planted immediately adjacent to the BT-rootworm field or within the BT-Rootworm field in a block or blocks. The field continuous corn history of the refuge and the BT-rootworm field must be identical. The refuge must be controlled by the farmer of the BT-Rootworm field and a neighbor's field does not qualify for a refuge. Check with your seed-dealer for more details about the EPA required refuge.

Do Nothing Option

A number of farmers in NYS try the "do nothing to control CRW option" every year. Moderate root damage and the associated yield losses in these fields are often missed because NYS does not have the level of wind to flatten fields of weakened corn stands like the Midwestern states. Plants with moderate root damage responsible for 0-15% silage yield losses often remain standing with little goose-necking under NYS growing conditions. In good moisture years like 2004, these plants are under limited water stress so the associated yield losses are low. However, under drought stress in dry summers, yield losses from moderate levels of root damage can approach 15% silage yield losses. If a farmer is growing 18 Ton/Acre silage and the value of the silage is $25/Ton then these losses can approach or equal $67/Acre without the farmer even suspecting the insect damage and yield loss due to the straight standing corn plants. As root damage increases in untreated fields with higher levels of corn rootworm larvae, yield losses can easily exceed 50%. Fields with yield losses exceeding 25% are often severely goose-necked and the yield losses are a combination of physiological yield losses from water stress and harvest losses from the goose-necked corn not being efficiently harvested by the chopper. With the wide variety of rootworm management options available to NYS farmers for 2005, the "Do Nothing Option" should be a practice of the past.

Table 1. Efficacy of Corn Rootworm Insecticides in 2003 and 2004.

Product	Rate	Root Rating 2003	Root Rating 2004
Force	4 oz/1000 ft row	2.15 a	2.50 ab
Poncho	250 (0.25 mg/seed)	rate not tested	3.30 ab
Poncho	1250 (1.25 mg/seed)	2.40 a	2.60 ab
Cruiser	0.25 mg/seed	rate not tested	3.50 ab
Cruiser	1.25 mg/seed	rate not tested	2.80 ab
YieldGard Rootworm		2.00 a	2.10 a
Untreated Check		5.10 b	3.60 b

Whole Farm Corn Starter Phosphorus Fertilizer Imports

Nutrient Management

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Introduction

The results of the New York Starter P Project (see What's Cropping Up? 14(1): 1-3 and 14(5): 1-2) showed that on sites that test *high* in P and have no manure applications planned for the season, no yield or quality 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 or quality penalty. This assumes that the proper pH (minimum of pH 6.0 for corn) is maintained and other nutrients are available in sufficient quantities.

At the 2003 Empire Farm Days, 75 producers from 30 New York counties filled out a survey on starter P use in corn. Of these producers, 37% grew more than 200 acres of corn, 25% had 100-200 acres in corn production while 37% had less than 100 corn acres. That winter, 274 producers (24 different New York State counties) answered the same survey questions during Cornell Cooperative Extension meetings. Of the latter group, 26% grew more than 200 acres of corn, 32% had 100-200 acres, and 42% had less than 100 corn acres. The combined groups represented over 72,000 acres of corn. The surveys indicated that the three most common starter blends were 19-19-19, 15-15-15, and 10-20-20 and that the average application rate was 250 lbs/acre (the equivalent of 48 lbs of P_2O_5/acre).

We analyzed 30 complete dairy farm plans to answer the question: how many pounds of P_2O_5 can a dairy farm save by shifting from a standard starter application of 250 lbs of 19-19-19 (48 lbs P_2O_5/acre) to soil-test based management for corn?

Materials and Methods

Soil tests and field data (crops and planned manure applications) were obtained for 30 dairy farms from across New York State. The acres of corn per farm ranged from 41 to 1,488 acres. The percentage of acres testing high or very high in P varied from 18% (corn acreage basis) on the farm with 41.3 acres of corn to 92% on a farm with 982.6 acres of corn. On average 50% of all corn acres tested high or very high in P (48% on total farm acreage basis – i.e. including non-corn fields). This is similar to distributions observed in the database of the Cornell Nutrient Analyses Laboratory (see What's Cropping Up? 14(5): 3-6). The four scenarios are listed in Table 1. Scenario 1 assumes that all corn fields receive 250 lbs of 19-19-19, independent of soil test P level. In scenario 2, the application rate is reduced to 125 lbs of 19-19-19. Scenario 3 is soil test based management following Cornell recommendations (which implies a P-free starter and implementation of three rates of 19-19-19), while scenario 4 is a more producer friendly farm option with a P-free fertilizer for all fields that receive manure and/or test high or very high in P and 250 lbs of 19-19-19 for all other fields.

Table 1: Scenarios for P starter use as implemented on 30 dairy farms in New York.

ID	Blends	Rates	Description
(1)	1	1	250 lbs of 19-19-19 for all corn fields, independent of soil test P
(2)	1	1	125 lbs of 19-19-19 for all corn fields, independent of soil test P
(3)	2	3	No fertilizer P (i.e. P-free starter) for fields testing very high in P For high P fields: • no fertilizer P (i.e. P-free starter) if manure is applied • 125 lbs 19-19-19 if no manure is applied For fields very low, low or medium in P: • 125 lbs 19-19-19 if manure is applied • 250 lbs 19-19-19 if no manure is applied for medium P soils • 300 lbs 19-19-19 if no manure is applied for low P soils
(4)	2	1	No fertilizer P (i.e. P-free starter) for: • all fields that receive manure • high and very high P soils that do not get manure 250 lbs 19-19-19 for all other fields

Results and Discussion

If we assume that all corn fields on the farm received 250 lbs of 19-19-19 per acre (scenario 1 in Table 1), P fertilizer imports onto the farms would have varied from 1,982 lbs P_2O_5 on the farm with approximately 41 acres of corn to 71,443 lbs P_2O_5 for the farm with 1,488 corn acres. Implementing a reduction in P application without shifting to two application rates (i.e. scenario 2; 125 lbs of 19-19-19 per acre for all corn fields) would reduce the average annual P imports by 11,244 lbs P_2O_5 per farm. Scenario 2 would not meet the P guidelines for all fields, and this could possibly impact corn yields on low P fields.

Following Cornell guidelines (scenario 3 in Table 1) would have allowed for substantial reductions in P fertilizer imports (Figure 1). However, this scenario implies the use of two blends (a P-free blend and a P-containing blend) and 3 rates (125, 250 and 300 lbs of 19-19-19 in our example) for the P-containing blend and may not be practical on many farms. On 15 of the 30 farms, all high P fields were scheduled to receive manure. Shifting to a more practical management option of 250 lbs of 19-19-19 per acre for low and medium P corn fields that do not get manure and P-free fertilizer for all other corn fields (scenario 4 in Table 1), would have eliminated the use of P containing starter on 12 of the farms and reduced the average annual P

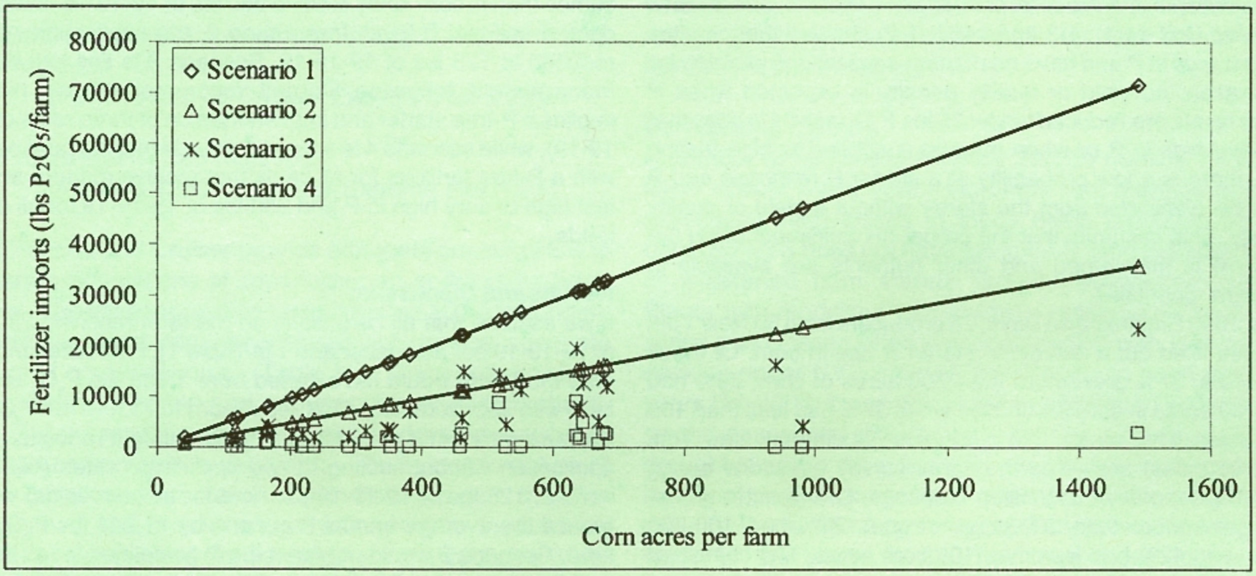

Figure 1: Effect of starter fertilizer management on whole-farm corn starter P imports. Scenarios are explained in table 1.

fertilizer imports on the other 18 farms from 1,982-71,443 lbs of P_2O_5 under scenario 1 to 144-10,992 lbs of P_2O_5 under scenario 4 (Table 2 and Figure 1). As shown by the results of the New York Starter P Project, in most years, this shift to scenario 4 is not likely to negatively impact yield or quality of the forage. However, regular soil testing is needed to monitor soil test P levels over time.

Soil test based management for corn starters can save dairy producers money without sacrificing yield or quality. Let's take a look at a few cost saving examples. If we assume that 19-19-19 costs about $270 per ton, shifting from scenario 1 (250 lbs of 19-19-19) to a reduced rate of 125 lbs 19-19-19 per acre the producer would save almost $17 per acre for each field that did not need the extra P for optimum yield. If a producer is using 250 lbs of 19-19-19 per acre on fields testing high and very high in P and K, a shift to 115 lbs of ammonium sulfate per acre (approximately $200 per ton of 21-0-0) would result in a $22 per acre savings, while still providing a responsive amount of N in the starter fertilizer band (20-30 lbs N). A shift from 125 lbs 19-19-19 to 115 lbs of ammonium sulfate per acre (i.e. without altering the N application rate), would save the producer about $5.50 per acre. Corn fields that are very high in P tend to be high in K as well. Soil test results will indicate if extra K (as well as lime) is needed. If we assume testing fields on a regularly scheduled basis (at least once in three years) with a minimum of one sample per 10 acres, savings in fertilizer expenses easily exceed the cost of collecting and analyzing soil samples.

Conclusion/Recommendation

Fertilizing based on soil test results benefits the environment and farm profitability. *Depending on the acres of corn on the farm, cost saving on a whole-farm basis can be quite substantial.* We recommend that corn growers test their fields for soil fertility status at least once every three years, target manure to low and medium P fields where possible, and adjust starter P application rates accordingly. Low P or P-free blends are recommended for fields that regularly receive manure and/or are high in soil test P.

References

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3. Ketterings, Q.M., S.N. Swink, G. Godwin, K.J. Czymmek, A. Durow, and G. Albrecht (2004). New York Starter Phosphorus Project – Results of the 2003 growing season. What's Cropping Up? 14(1): 1-3.

Table 2: Effect of P starter management for corn on total P fertilizer imports per farm for 30 New York dairy farms. See Table 1 for a description of the management scenarios. Soil test classifications (Cornell Morgan test) are L (low), M (medium), H (high) and VH (very high).

County	Corn		Soil test phosphorus classification				P starter fertilizer use for corn fields under 4 different management scenarios			
			L	M	H	VH	1	2	3	4
	Acres	Fields	% of total corn acres				lbs P_2O_5/farm			
Yates	41	9	33	48	18	0	1982	991	924	168
Dutchess	114	24	17	24	59	0	5458	2729	1726	144
Clinton	114	8	16	35	50	0	5467	2734	1375	0
Chautauqua	121	18	16	30	28	27	5827	2913	1339	0
Erie	165	14	10	35	50	5	7920	3960	2400	768
Chautauqua	169	19	49	35	14	2	8088	4044	4089	1008
Yates	203	29	16	24	47	14	9758	4879	2741	307
Ontario	219	16	33	8	24	35	10507	5254	2693	0
Erie	237	15	20	16	42	23	11381	5690	2006	0
Cattaraugus	289	16	10	19	71	0	13872	6936	2016	0
Erie	314	26	6	26	49	20	15077	7538	3228	533
Chenango	348	31	9	15	45	30	16685	8342	3453	1896
Jefferson	352	18	20	18	41	20	16896	8448	3288	0
Erie	383	28	47	32	21	0	18360	9180	7236	0
Cortland	458	30	1	15	79	5	21960	10980	1944	0
Clinton	461	24	6	35	59	0	22142	11071	5842	2664
Jefferson	464	19	48	26	22	5	22272	11136	14808	10992
Chautauqua	519	41	51	16	33	0	24898	12449	14383	8803
Cattaraugus	527	28	0	36	64	0	25296	12648	4613	0
Franklin	552	40	27	59	13	1	26506	13253	11398	0
Jefferson	637	33	19	19	54	7	30576	15288	7275	2352
Schuyler	638	52	62	17	20	0	30600	15300	19527	9264
Cattaraugus	643	51	30	14	48	8	30845	15422	7899	1474
Jefferson	646	35	16	46	35	2	31008	15504	12756	4896
Ontario	670	40	3	9	66	22	32150	16075	5246	672
Chautauqua	677	49	30	38	31	1	32486	16243	13739	2894
Columbia	684	60	44	9	17	31	32818	16409	12044	2674
Clinton	942	47	15	57	28	0	45197	22598	16198	0
Cayuga	983	70	2	7	68	23	47165	23582	4260	0
Franklin	1488	50	10	49	40	2	71443	35722	23522	2928
Average	468	31	22	27	41	9	22488	11244	7132	1815
Minimum	41	8	0	7	13	0	1982	991	924	0
Maximum	1488	70	62	59	79	35	71443	35722	23522	10992

Acknowledgments and For Further Information

Special thanks to the 30 producers that shared their whole-farm nutrient management plans with us and Sander van den Hoogen for evaluation the P fertilizer scenarios for the farms. For further information contact your local Cornell Cooperative Extension office, contact Quirine M. Ketterings at (607) 255 3061 or qmk2@cornell.edu, and/or visit the New York Starter P Project website: http://nmsp.css.cornell.edu/projects/starterp.asp.

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.

Crop Management

Recommended Corn Silage Hybrids

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Cornell University evaluates 95-115 day corn silage hybrids at two locations in central/western NY and 75-100 day corn silage hybrids at two locations in Northern New York. 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 one or two RM groups at a particular site when the hybrids are close to 65% moisture. We also take a 5-plant sample at harvest to determine moisture and to run silage quality analyses on all four replications of each hybrid at each site.

MILK2000, a spreadsheet from the University of Wisconsin, calculates milk/ton, a silage quality index, derived from neutral detergent fiber (NDF), NDF digestibility, crude protein, ash, and starch concentrations in the quality analyses. MILK2000 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 100 or greater (the average milk yield of each hybrid RM group is adjusted to 100 and hybrids within the RM group with above-average milk yields have values above 100). We have listed the comparative milk yields as well as comparative silage yields and milk/ton values for hybrids that have performed above-average in our trials (Tables 1 and 2). **Hybrids 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 tests.**

Central/Western NY

Hybrids 493XYG from Doebler and 37K84 from Pioneer performed exceptionally well in the 95-100 day RM group in 2004 (Table 1). The hybrids HLS047 from Hyland, 5424 from Chemgro, and 477SL continued to perform well in the 95-100 day RM group at these sites. Also, 5570 OF from TA Seeds, N51-Z7 from NK, HLS058 from Hyland, and 36N70 from Pioneer continued to perform well in the 101-105 day RM group. The hybrid DKC54-51, a 104-day hybrid from DeKalb, performed well in the 101-105 day RM group in the first year of testing.

Hybrids HLS067 and 34B23 from Pioneer continue to perform well in the 106-110 day RM group, despite being commercially released several years ago. Also, DKC57-84

Table 1. Recommended 95-115-day corn silage hybrids in New York based on tests in Cayuga and Livingston Co.

Brand	Hybrid	Comparative Silage Yield	Comparative Milk/Ton	Comparative Milk Yield	Years in Test
		%			
		95-100 day Relative Maturity			
Doebler	493XYG	110	98	108	1
Pioneer	37K84	107	100	107	1
Hyland	HLS047	101	103	104	2
Chemgro	5424	109	97	104	2
Doebler	477SL	99	101	101	3
		101-105 day Relative Maturity			
T.A. Seeds	5570OF	105	100	105	2
DeKalb	DC54-51	106	99	105	1
NK	N51-Z7	103	101	104	2
Hyland	HLS058	107	96	103	2
Pioneer	36N70	100	102	102	3
		106-110 day Relative Maturity			
Hyland	HLS067	105	102	107	4
DeKalb	DKC57-84(YGCB)	104	101	105	2
Pioneer	34B23	104	103	104	5
Hytest	TNT-106RR	103	99	102	2
Garst	8548YG1	100	102	102	1
		111-115 day Relative Maturity			
Garst	8292YG1	110	105	114	1
Pioneer	31G66	106	100	104	1
Mycogen	F697	92	112	103	1
Hytest	HT7711BT	104	100	102	2
Hytest	HT7683	102	100	101	1

(YGCB) from DeKalb and TNT-106RR from Hytest continued to perform well in their second year of testing. The hybrid 8548YGI from Garst had above-average silage quality in its first year of testing in the 106-110 day RM group in 2004.

A new 115-day hybrid from Garst, 8292YGI, had exceptional silage yields and silage quality in its first year of testing. Also, 31G66 from Pioneer, F697, a brown midrib from Mycogen, and HT7683 from Hytest performed well in their first year of testing in the 111-115 day RM group. Another hybrid from Hytest, HT7711BT, continued to perform well in its second year of testing.

Northern NY

Three hybrids from Hyland, HLS011, HLS014, and HLS009, continued to perform well in the 72-80 day RM group in Northern NY (Table 2). Hybrids HLS011, a 74-day hybrid, and HT7060BT/RR2, a 78-day hybrid from Hytest, had exceptional silage yields in 2004. Also, hybrids from Hytest (H7220BT/RR2 and TNT-85RR) and Hyland (HLS034) as well as from Garst (8865) continued to perform well in the 85-90 day RM group. The hybrids HT7220BT/RR2 and HLS034 continued to have exceptional silage yields in 2004. Also, DKC40-05, a new hybrid from DeKalb, performed well in the 85-90 day RM group.

A new 95-day hybrid from Mycogen, TMF 2M405, had exceptional silage yields in Northern NY in 2004. Also, 2D421 from Mycogen and 317SL from Doebler performed well in the 91-95 day RM group in their first year of testing. The hybrids N33-H6 from NK, DKC42-95 (RR2/YGCB) from DeKalb, and TA401DF from TA Seeds also did well in their second year of testing in Northern NY. The hybrid N3030BT didn't yield as well but once again had above-average quality in 2004. A new hybrid from Garst, 8787YG1, yielded very well and had above-average quality in its first year of testing in the 96-100 day RM group.

Conclusion

Hybrid selection is one of the most important management practices that affect corn silage yield and quality. Dairy producers should make an informed management decision, based on actual silage yield and quality data from New York, before selecting hybrids for the coming year. We urge seed companies to enter their hybrids in our corn silage hybrid testing program at a modest fee so New York dairy producers can make informed decisions in selecting their hybrids.

Table 2. Recommended 75-100-day corn silage hybrids in New York based on tests in Jefferson and St. Lawrence Co.

Brand	Hybrid	Comparative Silage Yield	Comparative Milk/Ton	Comparative Milk Yield	Years in Test
		%			
		75-80 day Relative Maturity			
Hytest	HT7060BT/RR2	105	104	108	1
Hyland	HLS011	107	99	105	2
Hyland	HLS014	102	100	102	3
Hyland	HLS009	100	101	100	2
		85-90 day Relative Maturity			
Hytest	*HT7220BT/RR2*	*109*	*101*	*109*	*2*
Hyland	HLS034	108	99	106	3
Hytest	TNT-85RR	105	102	106	2
Garst	8865	103	99	101	2
DeKalb	DKC40-05	101	101	101	1
		91-95 day Relative Maturity			
Mycogen	TMF2M405	124	100	124	1
Mycogen	2D421	111	101	112	1
NK	N33-H6	109	97	105	2
Doebler	317SL	104	101	105	1
DeKalb	DKC42-95(RR2/YGCB)	100	103	102	2
NK	N3030BT	101	102	101	5
T.A. Seeds	TA4010F	101	101	101	2
		96-100 day Relative Maturity			
Garst	8787YG1	112	101	113	1

Weed Management

Single Application Weed Control for No-Tillage Roundup Ready Soybeans

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As soybean acreage has increased in NY State, the proportion that is grown in a no-tillage system has increased dramatically. The shift to no-tillage soybean production has been fueled by adoption of Roundup Ready soybean technology. The ideal weed control program for this production system involves Preemergence (PRE) burndown of existing vegetation at planting followed by a postemergence (POST) application of Roundup or other glyphosate product. The authors' have observed that most growers are *not* following these guidelines. Instead, most are making a single Roundup application that serves both for burndown and POST weed control. In some, perhaps many cases, these single applications are being made too late resulting in reduced yields.

Experiments Established

Field experiments were conducted for 3 years at the Musgrave Research Farm near Aurora, NY to determine whether a single herbicide application can be used for burndown and for POST weed control in no-tillage Roundup Ready soybeans, and if so, the best timing for this application. Experiments were established in fields that had been fallow the previous year with heavy populations of common ragweed, giant foxtail, wild mustard, and other annual weeds. A no-tillage planter was used to plant soybeans 'Pioneer 91B91' in 15-inch rows June 10, 9, and 9 in 2002, 2003, and 2004 respectively.

Treatments

Herbicide treatments, shown in Table 1, included single applications of Roundup (UltraMax formulation) as a PRE burndown application or as POST treatments 2, 3, or 4 weeks after planting (WAP). These treatments were compared with a standard two-pass program of Roundup as a PRE burndown followed by (fb) Roundup 4 WAP. Other treatments included PRE burndown applications of Roundup plus either Boundary (premix of Dual II Magnum and Sencor) or Canopy XL (premix of Authority and Classic), and a PRE burndown application of Extreme (premix of glyphosate and Pursuit). These last three treatments were included in an attempt to provide some residual weed control along with the PRE burndown.

Weed Control

The standard two-pass program of Roundup fb Roundup provided an average of 84 and 76% ragweed and giant foxtail control over the 3 years. Single applications of Roundup, 3 or 4 WAP, provided similar control of these annual weeds. While each of the PRE burndown treatments with Roundup plus residual herbicide(s) provided better weed control than the PRE burndown application with Roundup alone, none of them controlled ragweed or giant foxtail as well as the two-pass program. These three treatments controlled an average of 61 and 57% of the ragweed and giant foxtail respectively compared with only 21 and 15% control when Roundup was applied alone as a PRE burndown treatment.

Soybean Yields

Soybean yields, averaged over the 3 years, are shown for the various herbicide treatments in Figures 1 and 2. Yields averaged only 29 bu/A with a single PRE burndown application of Roundup alone compared with 42 bu/A with the two-pass Roundup PRE burndown fb Roundup 4 WAP

Table 1. Weed control treatments for no-tillage, Roundup Ready soybeans at Aurora, NY.

Herbicides	Rate Amt/A	When App.
Roundup	26 oz	PRE
Roundup	26 oz	2 WAP
Roundup	26 oz	3 WAP
Roundup	26 oz	4 WAP
Roundup fb Roundup	26 oz fb 26 oz	PRE fb 4 WAP
Roundup + Boundary	26 oz + 1.25 pt	PRE
Extreme	3 pt	PRE
Roundup + Canopy XL	26 oz + 3.2 oz	PRE

program. Single applications of Roundup 2 or 3 WAP (Figure1) produced similar yields with an average of 41 bu/A over the 3-year period. If the single application of Roundup was delayed until 4 WAP the average yield dropped to 36 bu/A. Although the single PRE burndown applications of Roundup plus residual herbicides did not provide as good weed control as the two-pass program, two of the three treatments produced yields that were similar to the two-pass standard. The PRE burndown treatments with Extreme and with Roundup plus Canopy XL yielded 40 and 41 bu/A (Figure 2) respectively while PRE burndown with Roundup plus Boundary yielded less with an average of 36 bu/A.

These results support the concept of a single application for burndown and POST weed control in narrow-row, no-tillage Roundup Ready soybeans if that application is made 2 to 3 WAP rather than 3 to 4 WAP (the recommended timing for conventional tillage systems). These results also suggest that PRE burndown applications that include some residual herbicide(s) could also be used for single application weed control in no-tillage, Roundup Ready soybeans.

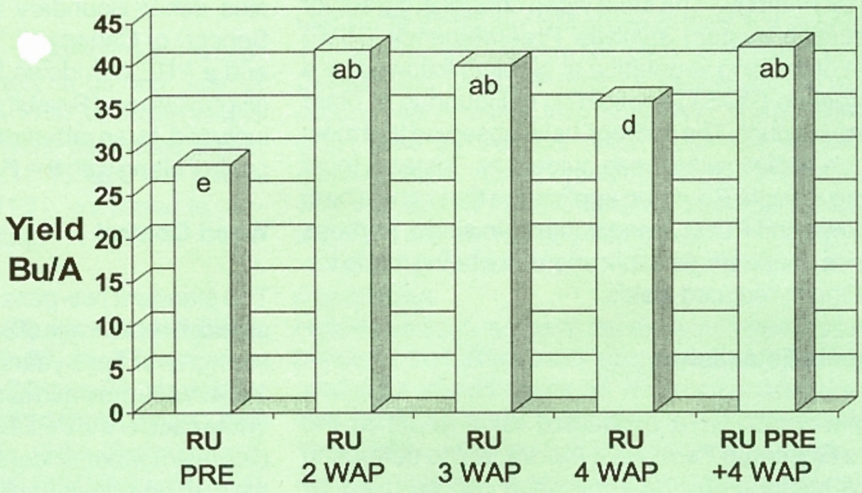

Figure 1. Average soybean yields (bu/A) from Roundup UltraMax treatments in no-tillage, Roundup Ready soybeans at Aurora, NY, 2002-2004.

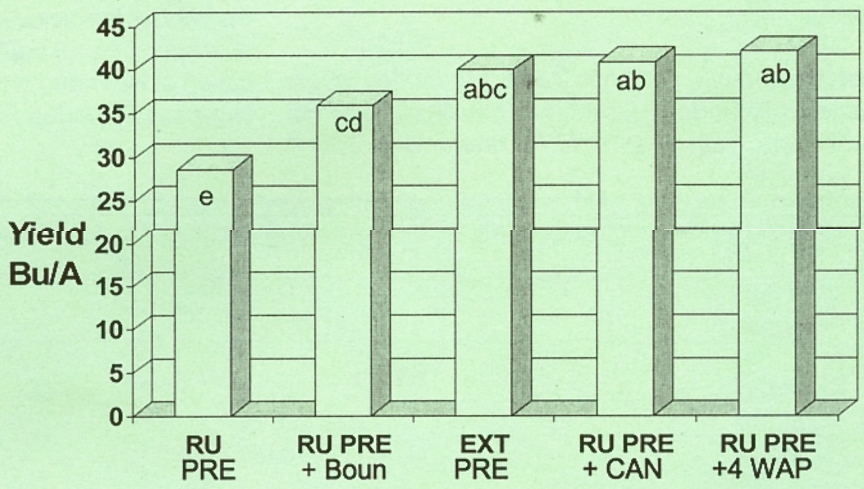

Figure 2. Average soybean yields (bu/A) from treatments of Roundup UltraMax applied alone and in tank mixes with residual herbicides in no-tillage, Roundup Ready soybeans at Aurora, NY, 2002-2004.

Calendar of Events

Dec. 15, 2004	Soybean Meeting, Tally Ho Restaurant, Richfield Springs
Jan. 3-6, 2005	Northeastern Weed Science Society, Washington, D.C.
Jan. 19, 2005	Western NY Corn Congress, Holiday Inn, Batavia
Jan. 20, 2005	Finger Lakes Corn Congress, Holiday Inn, Waterloo
Jan. 27, 2005	Winter Crop Meeting, Clarion, Ithaca
Feb . 7-10, 2005	Weed Science Society of America, Honolulu, HI
Feb. 9, 2005	Western NY Soybean/Small Grains Congress, Batavia Party House, Leroy
Feb. 10, 2005	Finger Lakes Soybean/Small Grains Congress, Holiday Inn, Waterloo
Feb. 22-23, 2005	NYSABA Annual Meeting, Holiday Inn, Auburn
Mar. 1, 2005	Northern NY Crop Congress, Elks' Lodge, Carthage
Mar. 2, 2005	Northern NY Crop Congress, St. Lawrence County
Mar. 3, 2005	North Country Corn Congress, Miner Institute, Chazy
Mar. 3, 2005	Quality Forage Forum, North Java Fire Hall, North Java
Mar. 4, 2005	Quality Forage Forum, Randolph Fire Hall, Randolph
Mar. 8, 2005	Field Crop Industry Day, Holiday Inn, Waterloo, NY

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