What's Cropping Up?

A NEWSLETTER FOR NEW YORK FIELD CROPS & SOILS VOLUME 1, NUMBER 2, 1991

SOIL COMPACTION I: The Plow Layer

Harold M. van Es
Soil, Crop and Atmospheric Sciences

Soil compaction may reduce crop growth and efficient field management. In addition, compacted fields may increase runoff and erosion and thereby adversely affect the environment. We distinguish two major types of soil compaction: plow layer and subsoil compaction. In this article, the first of a two-part series, the causes and effects of plow layer compaction are discussed. The second article will discuss compaction in the subsoil.

Causes

Under ideal conditions, a plow layer is well aggregated, has good soil tilth and has a rich microbial population. In New York, compaction of a plow layer is primarily caused by (i) traffic under wet soil conditions and (ii) the loss of organic matter. Traffic on wet soil is often caused by pressure to plant and harvest fields. If the soil is not sufficiently dry, its bearing capacity is too low for the loads of field equipment, causing the breakdown of soil aggregates into a denser soil mass. All kinds of traffic, including that from tillage, planting, harvesting, transport and spreading equipment contribute to this problem if they occur on wet soil.

A more gradual compaction of the plow layer is caused by loss of soil organic matter as a result of row crop production and intensive tillage. The breakup of soil by tillage increases oxidation and decomposition of organic matter and the pulverization of soil aggregates exposes previously protected regions to microbial attack. In addition, row crops generally return less organic matter to the soil than is decomposed, resulting in a net loss. This in turn reduces the release of polysaccharides which glue soil particles together into stable soil aggregates.

Effects

The loss of soil aggregation reduces the soil's infiltration capacity and therefore increases runoff and erosion during intense rainstorms. Reduced permeability of the plow layer also decreases drainage and delays soil drying.

In New York, compaction of a plow layer is primarily caused by (i) traffic under wet soil conditions and (ii) the loss of organic matter.

Compacted soils additionally reduce root proliferation, because they are too hard, especially when dry, for penetration. Reduced root volumes in turn affect water and nutrient uptake. Compacted soils also increase energy requirements for tillage and cause cloddy seedbeds and smeared furrow slices. The effects of plow layer compaction are more severe on fine-textured than coarse-textured soils, because the former depend more on good aggregation to create permeable and soft soil material.

Prevention/Alleviation

The most important method of prevention of soil compaction is abstaining from field operations during wet soil conditions. Our recent experiments have indicated that a two- to three-day delay can significantly affect yields. Soil compaction is also reduced by lowering wheel pressures through the use of lighter equipment, 4-wheel drive (which uses the whole vehicle weight for draft), trailed vs. 3-point linkage equipment, or track vs. wheel tractors. Use of dual wheels also reduces soil compaction, but is not recommended on a planter tractor, because it causes compaction on both sides of a plant row.

(See **PLOW LAYER, page 7**)

AGRICULTURAL METEOROLOGY

Growing Degree Days and Rainfall in the 1980s

Dave Masonis
Soil, Crop and Atmospheric Sciences

Now that the '80s is officially over, this would be a good time to look at growing degree day accumulations (86/50 method) and precipitation amounts during the growing season (May-October during the 1980's) and see how they compared to the climatological normals based upon the period 1951-80.

Monthly growing degree days were calculated at four locations that were selected to represent the crop growing regions of the state. The locations are: Albany for the Hudson Valley, Canton for northern New York, Cooperstown for the Susquehanna and Southern Tier, and Geneva for the Finger Lakes and western New York. Table 1 contains average growing degree day accumulations for the four above-mentioned sites for the 30-year period 1951-80 (NORM), the period 1981-90 ('80s), and the difference (1980s minus NORM).

A couple of comments regarding Table 1. One is that Junes in the '80s were cooler than the long-term average. The totals for July and August when combined come out near the long-term normal. The big difference has been in September and October which are much lower for the '80s than the normal. This also accounts for the largest portion of the lower totals for the May-through-October period. This suggests that during the 1980s instead of switching to longer season varieties, planting earlier would have been a better alternative as the late season accumulations were below the long-term average.

Table 2 contains the statewide weighted precipitation totals for the months of May through October by decade for New York. The precipitation total is obtained by weighting the ten climate division average monthly rainfall totals by the amount of the state average harvested cropland that is contained in each climate division. This gives a more agriculturally representative total.

Table 2. AVERAGE MONTHLY PRECIPITATION (INCHES)

YEARS	MAY	JUNE	JULY	AUG	SEP	OCT	TOTAL
1951-60	3.40	3.13	3.31	3.46	3.31	3.40	20.01
1961-70	3.01	3.21	3.17	3.60	2.95	2.67	18.61
1971-80	3.46	4.31	3.58	3.93	4.47	3.54	23.29
1981-90	4.04	4.07	3.58	3.77	3.84	3.58	22.88
1951-80	3.29	3.55	3.35	3.66	3.58	3.20	20.63
1961-90	3.50	3.86	3.44	3.76	3.75	3.26	21.57
CHANGE	+0.21	+0.31	+0.09	+0.10	+0.17	+0.06	+0.94

As shown in the precipitation table (Table 2), when the new 30-year normals are calculated for the period 1961-90, they will be higher than the normals currently in use. The decade of the 1980s continued the trend that began in the 1970s of wetter than normal conditions. Notice how dry the 1960s were, which was the last prolonged drought condition in the state.

Some precipitation anomalies in the 1980s: Three of the four wettest Mays on record occurred in 1984, 1988, and 1990. Five of the ten Junes in the decade were wetter than normal; however, 1988 was the second driest on record. July 1983 was one of the driest Julys on record and the first half of July 1988 was very dry, despite the fact that the month as a whole was wetter than normal. Only one August, 1985, can be considered below normal in the 1980s. No drier-than-normal years in September during the '80s. The last six Octobers have been wetter than normal with 1990 being the fourth wettest on record. ■

Table 1. AVERAGE GROWING DEGREE DAY ACCUMULATIONS (86/50)

	ALBANY			CANTON			COOPERSTOWN			GENEVA		
MONTH	NORM	'80s	DIFF	NORM	'80s	DIFF	NORM	'80s	DIFF	NORM	'80s	DIFF
MAY	333	344	+10	283	273	-10	301	304	+03	290	295	+05
JUNE	516	493	-23	457	427	-30	452	442	-10	488	473	-15
JULY	657	654	-03	586	596	+10	571	582	+11	631	645	+14
AUG	600	604	+04	538	527	-11	531	525	-06	592	576	-16
SEP	399	388	-11	348	329	-19	363	344	-19	397	365	-32
OCT	202	182	-20	164	139	-25	190	169	-21	194	159	-35
TOTAL	2707	2665	-43	2376	2290	-86	2409	2366	-43	2592	2514	-78

Corn Silage Management

CROP MANAGEMENT

Bill Cox
Soil, Crop and Atmospheric Sciences

Corn silage is an important forage crop on most dairy farms. Unfortunately, corn silage often receives second class status as a forage - a crop simply to plant, harvest, and place in the silo for winter feeding. Crop management practices such as hybrid selection, planting date, plant population, and timing of harvest can influence yield and quality of silage. In times of low milk prices, dairy farmers should follow recommended practices to produce high-yielding and high-quality silage as efficiently as possible.

Hybrid Selection and Planting Date

Silage yields among hybrids within a maturity group can vary by as much as 2.5 tons/A (Table 1). Quality characteristics such as total digestible nutrients, neutral detergent fiber, and crude protein also vary among hybrids. In general, high-yielding grain hybrids produce high silage yields with excellent quality. Some lower-yielding grain hybrids, however, also produce high silage yields and have excellent quality characteristics because of high stalk digestibility. Seed companies have begun to evaluate hybrids for silage yield and quality, so expect silage information on hybrids in the future.

The best silage hybrid, however, must be planted timely so it can realize its yield and quality potential. In central NY where the first killing frost occurs around mid-October, full-season hybrids, which have the highest yield potential, can be planted for silage until May 15 to May 20. In the Southern Tier or northern NY where the first killing frost occurs around mid-September, full-season hybrids can be planted for silage until May 10 to May 15. A delayed planting date has little effect on silage quality if the hybrid attains the 1/2 milk stage - about 65% whole-plant moisture (Table 1 - Aurora). A delayed planting date reduces silage quality when a hybrid does not attain the 1/2 milk stage (Table 1 - Mt. Pleasant).

Plant Populations

An easy way to increase silage tonnage at minimum cost is to increase seeding rates (Table 1). Modern hybrids require at least 26,000 plants/A at harvest for optimum silage yields; some hybrids require 30,000 plants/A. Silage quality is generally maintained as plant densities increase from 20,000 to 32,000 plants/A. High plant densities induce stalk lodging in some hybrids so timely silage harvest is essential when plant densities exceed 26,000 plants/A. Emergence averages about 85% under New York planting conditions, so planting rates for silage production should be 30,000 to 35,000 plants/A.

Harvest

Optimum silage yield and quality occur at about 65% whole-plant moisture. So, corn should be harvested as silage between 70 and 65% whole-plant moisture when stored in bunker silos and between 65 and 60% when stored in upright silos. To preserve the quality that has been produced in the field, good silo management practices are also essential. In conclusion, let's recognize corn silage as a first-rate forage that requires good management practices from planting to feeding. The future of New York dairy farms may depend upon it. ■

Table 1. Range in silage yield, total digestible nutrients (TDN), neutral detergent fiber (NDF), and crude protein (CP) for hybrids, planting dates, and plant populations averaged across three seasons at Aurora and Mt. Pleasant.

	YIELD	TDN	NDF	CP
	(tons/A - 65%)	%	%	%
Aurora				
Hybrid (~ 105-d hybrids)	24.0-21.5	72-71	41-44	7.1-7.7
Planting Date (4/24-5/22)	23.5-21.5	72-71.5	42-43	7.6-7.4
Plant Population (20,000-32,000)	23.5-21.0	72-71.5	42-43	7.6-7.3
Mt. Pleasant				
Hybrid (~ 90-d hybrids)	17.0-15.0	70-69	43-45	7.5-8.3
Planting Date (4/26-5/24)	16.0-14.5	70-67.5	42-46	8.0-7.8
Plant Population (20,000-32,000)	17.0-14.5	70-69.5	43-44	8.0-7.7

WEED CONTROL

Research Looks at Ways to Reduce Atrazine Rates

Russ Hahn and Paul Stachowski
Soil, Crop and Atmospheric Sciences *and* Graduate Field of Plant Protection

Although atrazine is the most cost effective and most widely used corn herbicide, current use patterns have led to concerns about its future role in corn weed control programs. For New York field corn producers, the major concern about atrazine has been the occurrence of triazine-resistant biotypes of common lambsquarters and smooth pigweed. Now, triazine-resistant strains of common groundsel and common ragweed are being reported. The fact that atrazine and other herbicides are recognized as potential sources of nonpoint pollution for surface and groundwater is another concern.

Two Strategies Investigated

As a result of the above concerns about atrazine use, seven experiments were conducted in New York and Pennsylvania in 1989 and 1990 to evaluate two strategies for reducing atrazine rates in annual broadleaf weed control programs for field corn. The first strategy was to apply reduced rates of atrazine early postemergence with and without crop-oil concentrate. The second strategy was to apply alternate herbicides early postemergence alone and with reduced rates of atrazine. The alternate herbicides were Banvel, Basagran, Buctril, and Prowl.

Treatments were applied in 20 gpa of water when corn had four true leaves. Weed control ratings shown were taken 8 weeks after treatment. Since the strategy of using alternate herbicides alone and with reduced rates of atrazine addresses concerns about triazine-resistant weeds and groundwater quality, discussion here will be limited to those treatments shown in the accompanying table.

Results Show Promise

Each of the alternate herbicides gave good control of the triazine-resistant common lambsquarters when applied alone. The addition of 1 pt/A of atrazine to each of the alternate herbicides significantly improved wild mustard control compared to control with the alternate herbicides alone. While pigweed control with Banvel or Buctril applied alone was excellent, pigweed control with Basagran or Prowl was improved when they were applied with 1 pt/A of atrazine. Banvel provided excellent ragweed control when applied alone, while each of the other herbicides benefitted from the addition of 1 pt/A of atrazine. This was especially true for Basagran and Prowl. Prowl gave excellent velvetleaf control and did not benefit from the addition of 1 pt/A of atrazine. The other herbicides did not give this level of velvetleaf control when applied alone or with 1 pt/A of atrazine.

Spraying the alternate herbicides in combination with 1 pt/A of atrazine improved the level and spectrum of control compared to the alternate herbicides applied alone. In addition, at least one of the alternate herbicides with 1 pt/A of atrazine controlled each of the weed species as well as or better than 1.5 qt/A of atrazine applied preemergence (data not shown). **Readers should be reminded that some of the herbicides were used at less than labeled rates for the purposes of this research. Always read and follow label instructions when applying herbicides.** ■

WEED CONTROL RATINGS WITH ALTERNATE HERBICIDES ALONE AND WITH REDUCED RATES OF ATRAZINE

Herbicides*	Amount Per Acre	Lambs-quarters**	Wild Mustard	Pigweed	Common Ragweed	Velvetleaf
		%				
Banvel	1.0 pt	98	86	95	99	87
+ Atrazine	1.0 pt	98	99	98	99	90
Basagran	1.0 pt	97	72	71	64	54
+ Atrazine	1.0 pt	93	99	99	96	85
Buctril	1.0 pt	98	78	97	90	63
+ Atrazine	1.0 pt	95	99	98	99	84
Prowl	1.5 qt	98	72	82	19	96
+ Atrazine	1.0 pt	99	99	99	90	97

* Banvel, Basagran, and Buctril treatments included preemergence applications of 2 qt/A of Bladex 4L in the triazine-resistant lambsquarters experiments or 2 pt/A of Dual 8E in all other experiments.
** Triazine-resistant biotypes of common lambsquarters.

Growing Your First Crop of Soybeans

CROP MANAGEMENT

Madison Wright
Soil, Crop and Atmoshperic Sciences

Growing soybeans has a lot in common with growing other annual grain crops, so a first-time producer can approach the task with confidence. The soybean is one of the Big Four field crops nationally; there's lots of guidance available from many sources.

Still, New York is in far right field, geographically speaking. Not all the information and advice about soybeans that originates in the Corn Belt applies here. Our experience tells us to be especially careful about certain matters. Four of these can be labeled "three m's and an i."

M1. Maturity Group

The first "m" is maturity group. In upstate New York we must use varieties in the very early maturity groups, namely Group 00, Group 0, Group I or Group II. Frost will catch varieties in later groups while the seeds are still in the juicy green stage. We should avoid that problem.

There have been two drawbacks to growing the earliest-maturing soybeans. One is that U.S. seed companies have not developed many very early varieties, because the market for them has been small. Even now, most of the Group 0 varieties in our tests originate in Canada, and all the Group 00 varieties we are testing are Canadian. Your local seed dealer may not yet have a convenient link to Canadian sources, though this is being corrected.

The second drawback used to be the poor yielding performance of the early varieties. Happily, soybean breeders have now developed quick-maturing varieties that can turn out impressive yields when they are offered good conditions. Yields in New York are now on a par with those in other areas.

> Advice:
> *When starting out with soybeans, choose a variety that is a little earlier than full-season.*

M2. Machinery

Only a few pieces of equipment are needed to grow soybeans. But many New York dairy farms lack two of them, owing in large part to the abandonment of oats as part of the crop rotation on those farms.

A modern drill (one with double disc openers, presswheels, depth bands, and seed meters that handle the seed gently) is required to ensure quick, uniform emergence of soybeans because the seed is large and fragile. A corn planter meets these requirements, but because we use narrow rows there may be excessive tractor time and wheeltracking from double planting.

A combine is required for harvest. The crop, once ripe, will usually tolerate a delay of a week or 10 days without much shatter or staining. But in many neighborhoods a grower cannot be confident that a well-adjusted combine will appear promptly to harvest the soybeans.

M3. Marketing

New York soybean growers do not dispose of their soybeans in the same way as their Midwestern counterparts do. In the Midwest soybeans move to local elevators and then to mills for extraction of oil. Our soybeans, in contrast, are mainly fed raw, or roasted for feed, or extruded for feed, or processed into oriental foods.

This diverse market bypasses many of the small feed mills with which our farmers are accustomed to deal; so if a first-time grower has not scanned the possibilities in advance, his assumptions about marketing may be unrealistic.

I. Inoculation

One of the reasons why soybean can be grown rather cheaply is its ability to fix its own nitrogen. The bacteria that fix nitrogen for soybeans are not native to our soils, however. And they are not quick to take hold, even if properly added by the grower. Successful inoculation requires fresh cultures of special soybean bacteria. They must be applied just before planting, and a double rate is advisable if the field has not grown soybeans with the past few years.

Both Cornell Recommends for Field Crops 1991 (page 67) and the Cornell Field Crops and Soils Handbook (page 159) are useful references for novice growers of soybeans in New York. There is also an annual mimeo from Cornell that summarizes variety tests at five locations across the state. ■

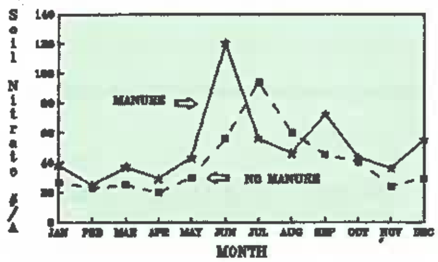
SOIL FERTILITY

UNDERSTANDING SOIL NITRATES

W. Shaw Reid
Soil, Crop and Atmospheric Sciences

Nitrate nitrogen (NO_3^-) is the source of most nitrogen (N) taken up by plants. Nitrate is also the source most commonly lost from soils. Nitrate moves with soil water into the growing plant or is leached with drainage water. It is important to optimize N for crop production, yet minimize N loss to the environment. Thus, adequate quantities of nitrate must be present during the cropping season with little residual soil nitrate after cropping. Soil nitrate, as determined by the Cornell Nutrient Analysis Laboratories, can be used to evaluate relative effectiveness of the N management program, but evaluations are relative because nitrate results are always changing. There are gains in soil nitrate from mineralization of organic materials, fertilizers, biological N fixation, and the atmosphere. Loss of nitrate is primarily with excess soil water through leaching, runoff, and denitrification to N_2 gas. Nitrate from soil test analysis is the difference between gains and losses at the time of sample analysis. *Changes in soil nitrate continue after sampling until the soil is very dry; therefore, unless the sample was dried or analyzed within a day or two, the soil nitrate values could be erroneous.*

AVERAGE SOIL TEST NITRATE
CU Nutrient Analysis Labs 1988–89



Average nitrate concentrations from corn fields during 1988-89 with or without manure are shown in the figure. Soil nitrate values begin the year below 30 #/acre and decrease until early April. Soil microbes convert the N in organic materials to nitrate; thus, nitrate values increase rapidly as soils warm during spring to early summer. Plant uptake increases rapidly during late June and early July decreasing the soil nitrate through August and September until the corn plant matures. If mineralization of organic N to nitrate is sufficiently rapid, soil nitrate can supply sufficient N to meet plant needs. During the fall, the plants no longer remove nitrate, yet mineralization continues slowly until soil freezes. If the fall is dry, little leaching or denitrification occurs and soil nitrate increases; if there is excess water, leaching or denitrification occurs and soil nitrate decreases. Once soil freezes there isn't much change until thaw when most of the nitrate is leached or denitrified.

(See **NITRATES**, page 7)

Table 1. Relative interpretations for soil nitrates by time of the year.

Soil Nitrates #/A	Interpretation
WINTER to EARLY SPRING - *Soil microbes are inactive, no mineralization to nitrate occurs. The nitrate values are no use for crop production because most nitrates are lost before crop growth. These values plus soil and climate data can be used to estimate potential nitrate losses.*	
0-25	Low residual soil nitrates. Little potential for additional nitrate loss.
25-50	Medium residual soil nitrates. Probably could be reduced further with careful management.
50+	High to excessive soil nitrates. Reduce manure, fertilizer and/or crop residue; improve crop removal.
LATE SPRING to EARLY SUMMER - *Mineralization of organic N to nitrate is very rapid; leaching has usually stopped. Thus, most nitrate is likely available for crop growth. Special soil sampling during June can provide soil nitrate values for estimating if additional fertilizer N is needed.*	
0-15	Low soil nitrate. Probably needs additional fertilizer N for corn production.
15-25	Medium to high soil nitrate. May need some additional sidedress N.
25-50	Probably does not need additional N for most crops unless N losses occur.
50+	Excess nitrate present. Avoid adding more as fertilizers or manures. Evaluate N management program.
LATE SUMMER to EARLY FALL - *Soil mineralization still occurs. Cannot use soil nitrate values to determine if additional fertilizer N was needed without knowing the N status and maturity of the crop.*	
0-15	Nitrates may be poor to adequate depending on soil mineralization potential and crop needs.
15-25	Nitrates probably adequate for optimum crop growth.
25-50	Nitrates adequate for current crop growth and may be in excess.
50+	Nitrates probably in excess for current crop. Evaluate fertilization program relative to soil yield potential.
FALL and EARLY WINTER - *Crop uptake has slowed or stopped. Soil mineralization has slowed, but has not stopped. Soil nitrates will be lost before next crop. It is desirable to have very low residual soil nitrate values.*	
0-25	Low soil nitrate. If optimum crop yields were produced, it was a good nutrient management program.
25-50	Medium soil nitrate. Careful use of fertilizer and manure to match yield potential could decrease soil nitrates.
50+	High soil nitrates. Readjust fertilizer, manure and/or crop residue to avoid excessive soil nitrates.

RESIDUES

PLOW LAYER, from page 1

Compaction can also be reduced by limiting traffic to designated lanes, which leaves the areas outside these traffic zones spared from vehicle loads. The ridge-till system, for example, forces the land manager into a controlled traffic pattern. To benefit fully from controlled traffic, all field equipment needs to be of equal width (e.g. six rows). The effect of vehicle loads can also be reduced by keeping unnecessary field traffic (e.g. unloading of combines and choppers in the middle, as opposed to the edges of fields) to a minimum.

Soil compaction is alleviated, at least partially, by the use of sod-based rotations and the application of organic materials (manure, cover crops, etc.) Freezing and thawing, and wetting and drying cycles also help reduce the effects of soil compaction. Since these processes occur most frequently near the soil surface, compaction is more easily reduced at the top of the plow layer. For a sandy soil, one season of freezing cycles combined with tillage can completely alleviate the effects of compaction, while for a clay soil, this may require five years. In reality, most fields are compacted on a yearly basis and fine-textured soils therefore will not reach their pre-compaction status unless taken out of row crop production. ■

NITRATES, from page 6

Interpreting soil test nitrate values

These interpretations are to be used only as general guidelines. There are many factors influencing mineralization of organic N and conversion of ammonium to nitrates to provide specific recommendations without more information. If sampled soon after manure or fertilizer applications, nitrate values represent both soil and applied N. Unusual rainfall preceding sampling results in nitrate values different than expected and must be considered during interpretations. Even though nitrate values must be interpreted carefully, they can be used to evaluate relative N status on samples taken at the same time from year to year or from field to field. When used with other soils and cropping information, such as rotations, manure and fertilizer additions, climate, etc., soil nitrate values permit evaluation for the farm's N management program. ■

AURORA FIELD DAY - July 12

Come view the research plots and chat with some Cornell researchers. Highlighted research will include corn grain and silage variety trials, soybean variety trials, field crop weed control, seed treatment of oats, sustainable agriculture practices, corn and alfalfa management, corn rootworm management, banded herbicide/cultivation, and much more. Also, there will be a tour of the newly-constructed Leon Field Laboratory. So, *please reserve July 12 on your calendar for the Aurora Field Day.* ■

HAHN RECIPIENT OF NEWSS AWARD

Russ Hahn received the first "Outstanding Applied Research Award for Food and Feed Crops" from the Northeastern Weed Science Society during the group's 45th Annual Meeting in Baltimore, January 8-10, 1991. The award recognizes outstanding achievements in applied weed science research that directly benefit and are used by Northeast farmers. Russ was specifically recognized for his clear and concise weed control recommendations and his ability to incorporate practical insight into his research so that his results directly benefit the growers. The $1,000 award, which is in support of the recipient's research program, is sponsored by Agway, Inc. ■

NEW PUBLICATIONS!

"*Nitrogen and the Environment*" (Information Bulletin No. 218) by Harold van Es, Stu Klausner and Shaw Reid, and Associate Editor Nancy Trautmann, is available now through the Cornell Distribution Center, 7 Research Park, Ithaca, NY 14850.

"*Perennial Grasses for New York State*" (Extension Series No. 2, 12/90) by Gary Fick is available through the Department of Soil, Crop and Atmospheric Sciences, 142 Emerson Hall, Cornell University, Ithaca, NY 14853.

"*Calibrating a Manure Spreader*" (Extension Series No. E91-1) by Stu Klausner is also available through the Department of SCAS. ■

SOIL TESTING SERVICES

Prices of Soil Test Kits have increased to $10.00 for standard (pH 5.0-7.2) or low (pH 3.8-6.2) range kits, and to $18.00 for wide (pH 3.8-8.2) range kit. The increases were effective 12/17/90, as a result of State budget pressures.

The Cornell Nutrient Analysis Laboratories' staff are working hard to maintain rapid, efficient service to New York State growers. If you have questions or comments on the service, please contact W. Shaw Reid, Director, 803 Bradfield Hall, Cornell University, Ithaca, NY 14853, or phone (607) 255-1722. ■

Calendar of Events

June 6, 1991	Small Grain Management Field Day, Aurora, NY
July 2	Cornell Seed Growers Field Day, Ithaca, NY
July 7-10	Northeast Agronomy Meeting, Rugters U., New Brunswick, NJ
July 12	Aurora Field Day, Aurora, NY
July 15-16	Empire State Soil Fertility Association 1991 Summer Tour
July 17	Cornell Weed Science Field Day, Aurora, NY
July 18	Cornell Weed Science Field Day, Freeville *and* Ithaca, NY
August 4-7	46th Annual SWCS Meeting, Lexington, KY
August 18-22	American Phytopathological Society Annual Meeting, St. Louis, MO

What's Cropping Up? is a bimonthly newsletter distributed by the Department of Soil, Crop and Atmospheric Sciences 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: Soil, Crop and Atmospheric Sciences, Plant Breeding, Plant Pathology, and Entomology. To subscribe for 1991 send a check for $8.00 along with the form at the right.

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