CORNELL UNIVERSITY TURFGRASS TIMES

CUTT

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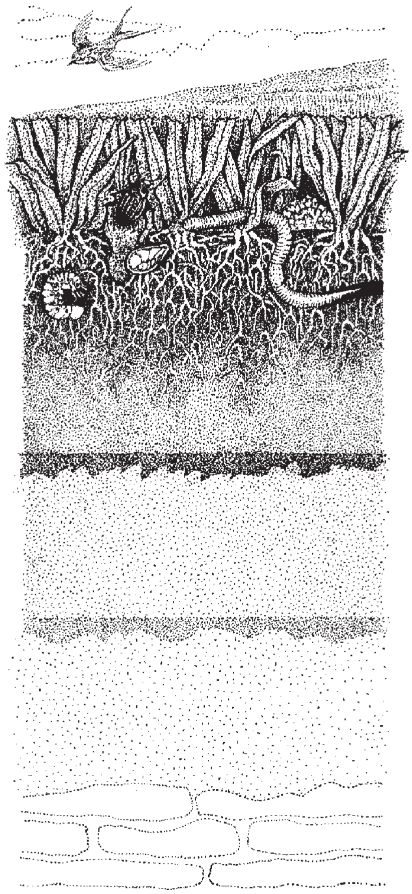

Getting The Most Out Of A Soil Testing Program

Soil testing is one of the most basic turfgrass management tools. It is the only means of learning the nutrient status of your soil. It can be most helpful as you develop your fertilizer program for the coming year.

A soil test is of little value unless the sample sent to the lab is representative of the area. Since the sample usually represents a large area, you should carefully follow sampling instructions. ■

Soil Sampling

Fertilizer applied to an established turf tends to accumulate in the surface inch or two of soil. The nutrients are not evenly distributed through the rootzone. It is therefore important that you always sample to the same depth. Failure to do so can cause inconsistent results. Mark your sampling tube with a piece of tape to make sure samples are taken from the same depth.

Keep careful records of how and where you obtained your samples. If you stick to a regular sampling plan, you will be able to accurately document changes in fertility through time.

The Soil Test

A soil test is a chemical method of estimating the nutrient supplying power of the soil. The means of coming up with this "estimate" may vary from lab to lab because there are several ways to extract nutrients from soils. This explains why results from different labs do not always agree. Some methods only remove those nutrients that are in the soil solution. Other methods try to predict availability of reserve nutrients by extracting those on cation exchange sites.

More important than the soil test method used, is how the results are interpreted. The following questions must be addressed by the lab making recommendations: What do the measured levels mean? Will additions of nutrients at this soil test level produce a desirable response? If so, how much of the nutrient should be added until a benefit is no longer obtained?

These are not easy questions to answer. Soil test results must be calibrated against a plant response to applications of the nutrient in question.

Soil test calibration studies conducted at Penn State have helped refine recommendations for the methods we use. Much more work is needed, however, to improve our ability to interpret results for the methods used on different soil

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This Times

Short Cutts

January 16
New York Turf and Landscape Conference

February 20
Finger Lakes Cooperative Extension Turf Meeting

March 6
Professional Turf and Landscape Conference

June 27
Cornell Turfgrass Field Day

Please turn to page 7 for* CUTT *subscription information.

Faculty and Student Update

Ron White has recently assumed Farm Manager responsibilities at the Cornell Turfgrass Field Research Laboratory. Ron's responsibilities include overseeing the day-to-day operations of the Research Lab. Ron has worked in the turf program as a technician for about 12 years. We are grateful to have someone of Ron's caliber in this very important position.

Cornell Turfgrass Field Day

Mark June 27, 1991 on your calendar. This is the date of the 1991 Cornell Turfgrass Field Day. Held every other year, the Field Day is a great opportunity for industry to view the multitude of turfgrass research projects underway at Cornell. Several acres of new turf area and many new tests have been established since our last field day. Among the new areas are several new variety trials, including bentgrasses, bluegrasses, and buffalograsses. Be sure to mark your calendar for this informative and enjoyable day.

Scene from 1989 Field Day

Calendar of Educational Events

January 16

New York Turf and Landscape Conference, White Plains. Contact: Dave Chinery, Westchester Cooperative Extension, 914-682-3072.

February 20

Finger Lakes Cooperative Extension Turf Meeting. Contact: Jim Willmott, 716-461-1000.

March 6

Professional Turf and Landscape Conference, Sponsored by Nassau Suffolk Landscape Gardeners Association. Nassau Coliseum, Uniondale. Contact: Pat Voges, 516-665-2250.

June 27

Cornell Turfgrass Field Day. Cornell Turfgrass Field Research Laboratory. Contact: Norm Hummel, 607-255-1629.

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Editor-in-Chief: Norman W. Hummel, Jr.
Masthead Illustration: Benn Nadelman
Illustrations: Patti Witten and Timothy Tryon
Design & Production: Ghostwriters, inc., Ithaca, NY

Alternatives to 2,4–D

Because of a suggested link in the literature between chronic exposure to phenoxyacetic acid herbicides and a rare form of cancer, alternatives to 2,4-D for the control of broadleaved weeds in turfgrass are being investigated. A Cornell researcher recently compared several non-phenoxy herbicides with 2,4-D, alone and in combination, for control of white clover, dandelion, and broadleaf plantain. Control of broad-leaved plantain equivalent to that of 2,4-D was achieved with a tank mix of Clopyralid plus Triclopyr. BAS 514 alone or in tank mixes with Clopyralid, Chlorflurenol, Dicamba, or Triclopyr produced dandelion control equivalent to or better than that realized by 2,4-D alone. White clover was effectively controlled by all non-phenoxy herbicides tested, but not by 2,4-D. A pre-mixed herbicide combination of Clopyralid plus Triclopyr gave effective control of all three weed species, and is known to control other weeds as well (buckthorn plantain, yellow woodsorrel, ground ivy). Hence this product represents a promising alternative in certain turfgrass applications to the use of phenoxyacetic herbicides, although more research regarding the tolerance of turfgrass to this mixture, and its weed control spectrum, is needed. *(From: Joseph C. Neal, 1990. Non-Phenoxy Herbicides for Perennial Broadleaf Weed Control in Cool-Season Turf. Weed Tech. 4(3):555-559.)*

Control of Pink and Gray Snow Mold

Mercury is undesirable environmentally, and pentachloronitrobenzene is toxic to several grass species, but few other materials can control snow molds under a snow cover lasting 90 days or more. Canadian researchers have now shown that two triazole fungicides, triadimefon and propiconazole, are as effective as PCNB in the control of gray snow mold, and propiconazole, but not triadimenfon, is as effective as PCNB in controlling pink snow mold. Additionally, both triadimenfon and propiconazole appeared to reduce dollar spot infestations for at least a year following application, whereas PCNB showed either no or a small opposite effect in this regard. *(From: L.L. Burpee, A.E. Mueller, and D.J. Hannusch. 1990. Control of Typhula Blight and Pink Snow Mold of Creeping Bentgrass and Residual Suppression of Dollarspot by Triadimenfon and Propiconazole. Plant Disease 74(9):687-689.)*

Biostimulators for Bluegrass

In an attempt to compare the influence of certain "biostimulators" with a chelated iron source on the development of Kentucky bluegrass seedlings, researchers applied foliar applications of benzyladenine, propiconazole, triadimefon, a fortified seaweed extract, and iron phosphate citrate, alone or in combination, to single bluegrass seedlings in outdoor and greenhouse experiments. The fortified seaweed extract significantly increased all measured parameters of root and shoot development, propiconazole and triadimenfon were intermediate in effect, and benzyladenine was least effective of the biostimulators. The effect of chelated iron was positive but not as great as the better biostimulators; most effects seemed due to enchanced leaf and lateral bud development. Results of the iron and biostimulator combinations were highly variable, indicating the need for further study of these mixtures. *(From: J.M. Goatley, Jr., and R.E. Schmidt. 1990. Seedling Kentucky Bluegrass Growth Responses to Chelated Iron and Biostimulator Materials. Agronomy Journal:82:901-905.)*

Irrigation wih Sewage Effluent

Desert soils in the southwestern U.S. are often high in salts, sodium, and pH, and in some localities local law requies golf courses to use sewage effluent for irrigation, potentially exacerbating existing saline conditions. In the first study of its kind on soils of this type, researchers near Tuscon, Arizona compared the effects on soil and leachate properties of irrigating a golf course with sewage effluent *vs* potable well water over a 16 month period. Results of the soil study found no significant differences between treatments for pH, potassium, calcium, magnesium, iron, zinc, copper, or manganese, while levels of sodium, phosphorous, and nitrate nitrogen increased significantly in the effluent treatment. All increases were directly attributable to inputs from the effluent water, but none was great enought to injure the Bermudagrass turf. In the leachate study, pH, potassium, and carbonic acid content were not significantly different between treatments, while the sodium content was significantly higher. Conversely, calcium and magnesium were significantly higher in the potable leachate. In spite of the increased salinity of the effluent leachate,

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Scanning the Journals

A review of current journal articles

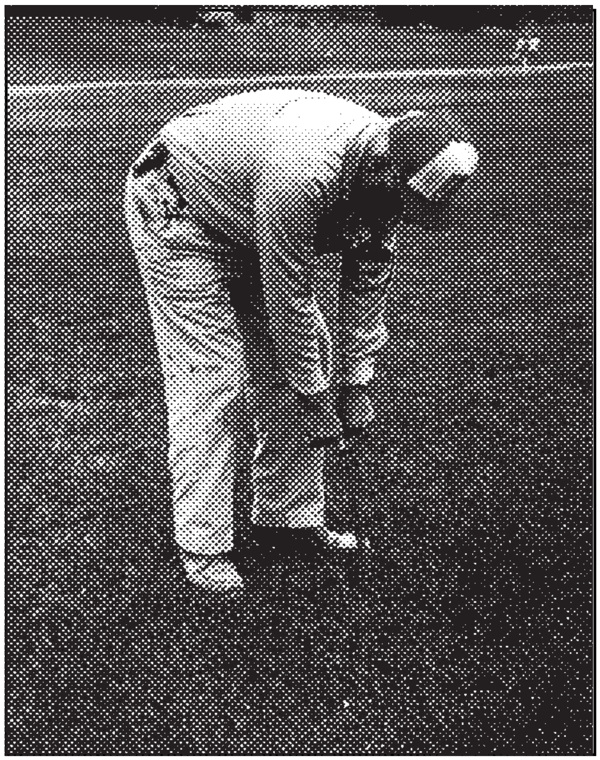
- **Carefully follow soil sampling instructions. Keep good records.**
- **Select a soil lab that suits your soil type.**
- **Choose a lab and stick with it to insure consistent results.**
- **Test at time of establishment and then every three to four years.**
- **If you have any questions on the test results or interpretations, ask.**

Soil Testing

continued from cover

types around the state.

Select a lab service that uses soil test calibration data for the interpretation of their results. Labs associated with the land grant universities usually have this information base as well as a knowledge of the soils in your state. Many commercial labs are basing their recommendations on calibration work from universities as well. Ask your lab representative how they arrive at their recommendations. If they don't know, find another lab.



***Soil Sampling**: 3 to 4 inch depth; remove thatch; take representative sample; collect 1 pint per sample; label bag; keep record.*

One of the most questionable practices being made by laboratories today is interpreting results for micronutrients. This is a perfect example of how our ability to analyze for a nutrient has exceeded our ability to interpret the results. Many factors besides soil levels will influence micronutrient availability. Organic matter, soil temperature, even grass species and cultivar will influence availability. Due to the complex nature of micronutrients, there has been little soil test calibration work done on turfgrasses. Therefore, if someone recommends that you apply micronutrients to turf because of low soil test levels, question their recommendation.

In summary, the following steps should help you get the most out of your soil testing program:

- Carefully follow soil sampling instructions. Keep records of how and where samples were taken.
- Look at several labs and find out if their testing procedures are the most appropriate methods for your soil types.
- Once you have found a lab, stick with them. Labs are not likely to change methods. Using different labs could mean different results.
- Soil test at the time of establishment and every three to four years thereafter. Allow at least a month turn around time for results.
- If you have any questions on the test results or interpretation, don't be afraid to ask. You will be able to obtain more information from the test report as your understanding of the process improves.

NORMAN W. HUMMEL, JR.

Scanning the Journals

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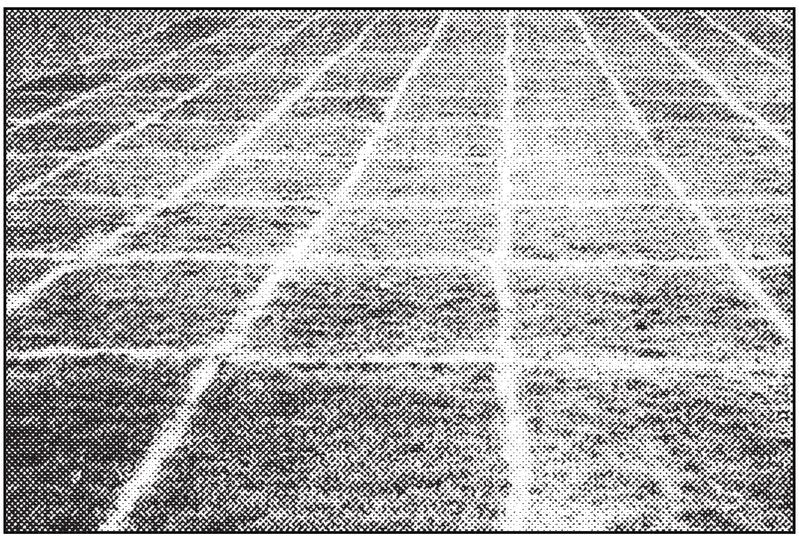
it did not exceed EPA maximum levels for drinking or agricultural water use. The study is being continued to evaluate long-term effects. *(From: A.R. Hayes, C.F. Mancino, and I.L. Pepper. 1990. Irrigation of Turfgrass with Secondary Sewage Effulent: I. Soil and Leachate Water Quality. Agronomy Jounal 82(5): 939-943.)*

Are Kentucky Bluegrasses Getting A Bad Rap?

Law makers on Long Island were considering outlawing Kentucky bluegrass as a lawn grass. Water district managers in the Delaware River basin bashed lawns, especially those planted to Kentucky bluegrass, at a conference a few months ago. We often hear that Kentucky bluegrass is a water-guzzling, fertilizer-loving lawngrass. Is Kentucky bluegrass getting a bad rap by some ill-informed people? I sure think so, and I would like to explain why.

Kentucky bluegrass has long been the lawn grass of choice in the Northeast. Lawns planted with a mix of Kentucky bluegrass and fine fescue 20, 30, or 40 years ago have persisted with little care.



New low maintenance bluegrass trials were established at Cornell in 1990.

The misconception that Kentucky bluegrass is a fertilizer-loving grass probably originated with the release of Merion Kentucky bluegrass in 1947. A beautiful grass when well fed, Merion became the "Cadillac of bluegrasses" and was widely planted from seed and sod until the 1970's. Merion Kentucky bluegrass, however, has a high nitrogen requirement and had to be fertilized heavily to maintain that luxurious look. Efforts by plant breeders in recent years have yielded bluegrass cultivars that look good with far less nitrogen than Merion.

Kentucky bluegrass also tolerates drought as well as most cool season grasses. Bluegrasses that perform well in drought conditions include Touchdown, Adelphi, Nassau, Victa, Ram I, Cheri, and others. Most other bluegrasses have the ability to survive extreme drought periods, but may do so by going dormant; conditions that are rare in the Northeast.

We have established a new trial this fall at Cornell to evaluate over 100 bluegrass cultivars under extreme low maintenance. With variety names like Crest and Cobalt, who knows what the future holds in low maintenance bluegrasses. Work recently reported from trials at Iowa State, however, found several cultivars of bluegrass that had superior performance in non-irrigated, low fertility experiments. Included in the list were several old common types, as well as several improved cultivars, such as Vantage, Argyle, Plush, Vanessa, Fylking, Victa, Monopoly, Mosa, Ram I, Harmony, and Kimona.

What are the alternatives? Fine leaf fescues have low water use rates, but go into summer dormancy much sooner than bluegrass. Tall fescue, being touted as a water conserving grass, actually uses more water than any other cool-season grass. Admittedly, tall fescue has a deep root system that helps it avoid drought better than bluegrass, but it cannot be called a water conserving grass.

Likewise, perennial ryegrass has a high water use rate, and is also quite responsive to increasing nitrogen rates.

No one can deny that bluegrasses will respond to inputs of water and fertilizer by looking more attractive. Kentucky bluegrass's label as a high maintenance grass, however, is unfounded. Kentucky bluegrass has, and should continue to be the lawn grass of choice in New York State.

Norman W. Hummel, Jr.

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Composting To Reduce The Waste Stream

Composting yard, garden, and some food wastes where they occur reduces the waste stream and creates a valuable soil amendment.

Composting saves both transportation and disposal costs, and provides an environmentally sound way to manage wastes.

Composting transforms organic waste into a soil-like material called compost. Compost can enrich the soil used for gardens, lawns, and house plants. Reducing the waste stream is part of the solution for solid-waste disposal problems. Composting yard, garden, and some food wastes where they occur reduces the waste stream and creates a valuable soil amendment.

Yard waste is a prime candidate for composting. Yard wastes make up approximately 20 percent of the residential waste stream. Traditional yard waste disposal methods have long been environmentally unsound and are becoming increasingly expensive. Composting saves both transportation and disposal costs, and provides an environmentally sound way to manage wastes.

Composting is the biological decomposition of organic matter. While decomposition occurs naturally, it can be accelerated and improved by human intervention. An understanding of the composting process is important for producing a high-quality product and preventing operating problems.

Microorganisms and invertebrates that decompose yard and food wastes require oxygen and water. Products of the composting process include soil-enriching compost, carbon dioxide, heat, and water. The heat produced increases the temperature in the compost pile from near-ambient temperature to as high as 160º F. The increased temperature results in increased water evaporation. The conversion of carbon in waste to carbon dioxide results in a reduction in both the weight and the volume of the pile. Nitrogen, contained in yard waste is necessary for microorganisms to carry out decomposition efficiently.

Decomposers

Decomposers are the microorganisms and invertebrates that accomplish composting. Naturally occurring microorganisms complete most of the chemical decomposition in the material being composted. These microorganisms include bacteria, molds or fungi, actinomycetes, and protozoa. Tiny invertebrate animals such as mites, millipeds, insects, sowbugs, earthworms, and snails, are the primary agents of physical decay. They break up waste debris and transport microorganisms from one site to another. The ease with which organic materials are composted depends on the type of decomposers, the type of organic material being composed, and the composting method used.

Factors Affecting the Composting Process

All natural organic material eventually decomposes. The length of the composting process depends on a number of factors: carbon and nitrogen contents of the material, amount of surface area exposed, moisture, aeration and temperatures reached during composting.

Carbon-to-Nitrogen Ratios

When combining organic materials to make compost, the carbon-to-nitrogen (C-N) ratio is important. Microorganisms in compost digest (oxidize) carbon as an energy source, and ingest nitrogen for protein synthesis. The proportion of these two elements should approximate 30 parts carbon to 1 part nitrogen by weight. Given a steady diet at this 30:1 ratio, microorganisms can decompose organic material quickly.

Most materials available for composting do not fit this ideal 30:1 ratio, so different materials must be blended to meet the ratio. Woody materials are very high in carbon. However, green wastes, such as grass clippings, fresh weeds, kitchen refuse, and manure, contain relatively high proportions of nitrogen. Proper blending of carbon and nitrogen helps ensure that composting temperatures will be high enough for the process to work efficiently.

Surface Area/Particle Size

Microbial activity occurs at the interface of particle surfaces and air. The surface area of material to be composted can be increased by breaking it into smaller pieces, or by other means. Increased surface area allows the microorganisms to digest more material, multiply faster, and generate more heat.

Aeration

Aeration replaces oxygen-deficient air in the center of the compost pile with fresh air. Rapid aerobic decomposition can only occur in the presence of sufficient oxygen. Regular mixing of the pile, referred to as turning, fluffs up the material and increases its porosity. Turning enhances aeration in a compost pile.

Moisture

Microorganisms can utilize only those organic molecules that are dissolved in water. A moisture content of 40 - 60% provides adequate moisture without limiting aeration. The "squeeze" test is an easy way to gauge the moisture content of composting materials. The material should feel damp to the touch, with just a drop or two of liquid expelled when the material is tightly squeezed in the hand. If the pile becomes too wet, it should be turned and re-stacked. Adding dry material, such as straw or sawdust, can also remedy an excess moisture problem. If the pile is too dry, it can be watered with a trickling hose.

Temperature

Heat generated by microorganisms as they decompose organic material increases compost pile temperatures. Pile temperatures between 90 and 140 (32° - 60° C) indicate rapid composting. A temperature probe or a soil thermometer, can be used to keep track of pile temperatures.

(Taken from: Composting to Reduce the Waste Stream, N. Dickson, T. Richard, R. Kozlowski. Northeast Regional Agricultural Engineering Service Publication NRAES-43. 46 pages.)

For ordering information, contact NRAES 152 Rile Robb Hall, Ithaca, NY 14853. Cost $6.00. Multiple copy discounts available.

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What is *CUTT* ?

CUTT is a quarterly newsletter from the Cornell University Turfgrass Faculty. The purpose of *CUTT* is to bring to you the latest research results from Cornell, as well as other universities, in a timely manner. Each issue, published to coincide with the change in seasons, will help you understand turfgrass better, enable you to manage your turf better, and maintain healthier turf with greater environmental protection ■

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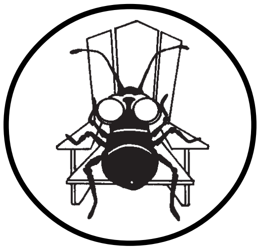
Weed Management in Winter



Pest Watch

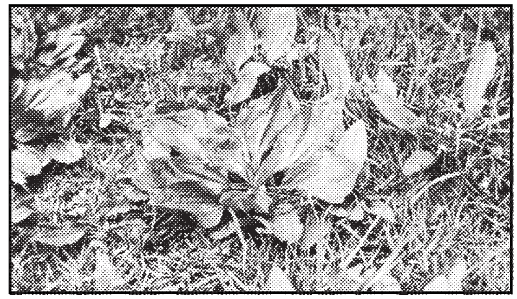
The goal is to optimize turfgrass quality, since your best defense against weed encroachment is a dense, healthy turf.

Weed management does not take a vacation in the winter. Now is the time to reassess last year's weed management program, to plan this year's program, and to repair and calibrate your equipment. The following are some of the questions you must ask yourself.

Are there areas which are weedy each year? If so, why? Many turf areas are prone to weed invasion. Evaluate these sites to determine if anything can be done to improve turfgrass density and quality. Correct compacted soil conditions. Reroute traffic. Improve drainage in wet areas. Improve wetting and irrigation in dry areas. Are these areas frequently damaged by other turfgrass pests? Check soil pH and fertility. If site conditions cannot be improved you might consider overseeding (or re-seeding) with a more well adapted turfgrass species or variety. The goal is to optimize turfgrass quality, since your best defense against weed encroachment is a dense, healthy turf.

Are there areas which are not weedy? If there are areas with a history of very good turf density and quality and no weed problems, then you may skip the scheduled preemergent treatments and go to a postemergent program on an as needed basis.

What weeds escaped your current weed control program, and why? Escapes can result from incorrect herbicide selection, incorrect weed identification, improper rate or timing, misapplication, new germination following treatment, or from poor site conditions which favor weeds over turf. Environmental conditions can affect herbicide performance. Unusually hot and dry, or cool and moist weather can shorten the length of residual control from preemergent herbicides and decrease the effectiveness of postemergent products. If you had escapes, try to determine why. Then you will be able to plan for more effective measures this year. Can areas under your management be prioritized? Prioritize high visibility areas for more intensive and timely treatments. Lower priority areas may receive only spot treatments for tough-to-control weeds or may not require treatment this year. To make these decisions, the turf must be scouted and hot spots mapped. This is best done in the fall.



Now is the time to plan your weed control program.

By asking and answering these questions, repairing and calibrating your equipment, and planning for the comming year, you should be able to improve upon your weed management program.

Cornell Cooperative Extension

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Cornell University
Ithaca, NY 14853