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TEXAS A & M UNIVERSITY

THE USGA/GCSAA TURFGRASS RESEARCH PROGRAM

by
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In the art of growing grass for golf, we stand on the threshold of a new era. Within the next decade, scientists in turfgrass research are going to provide us with new tools and new techniques to send the science, art and business of turfgrass management into the 21st Century.

But they are not going to do this alone! America's golfers are going to play an even more important role; they are going to pay for tomorrow's better turfgrasses. Who represents America's amateur golfers in this field of agronomics? You and I --- the American golf course superintendent and the USGA Green Section. This is said not to exclude others who also have a stake in better turfgrasses for tomorrow; golf architects, the PGA, club managers, regional and state golf associations, etc. But I say it to emphasize a fact and to make a point!

Historically, it has been the golf course superintendent and the USGA Green Section who have been the pioneers and the leaders in developing the best playing surfaces for golf anywhere in the world. Since the beginning of the game, it has been "the keeper of the green" who has perfected the skills and techniques of turfgrass management. Since 1921, it has been the USGA Green Section in the forefront of advances in turfgrass science; from better disease and weed control, to new grasses, to soil mixes for putting greens, to new fertilizers, irrigation studies, golf shoe investigations and even the Stimpmeter.

Naturally enough, the "easy phases" of turfgrass research were accomplished early on. They are only "easy" to us today because we have the privilege of looking back on them. But who will deny the frontiers of tomorrow are going to be a lot tougher to push back? Future programs can be made only with a well planned, coordinated and carefully monitored long range effort.

If you doubt that, look for a moment at the "research" of the past 20 or more years. We are just now emerging from an era we might call wheel-spinning turfgrass research. It has been generally going on throughout the nation. Scarce research monies were and some still are raised locally and then wasted on duplicated research efforts, poorly conceived projects and a lack of

knowledgeable, consistent supervision and overview. Let's be honest with ourselves. Too much research of the past 20 years; i.e., so called "research", was of a haphazard nature, lacking an overall plan and unfortunately, frequently the product of ego and/or political trips on the part of some fund raisers and even researchers! How many putting green soils mix research studies have you read about in the past 20 years? How many nitrogen, phosphorus and potassium studies on the same grasses and on the same soils have been conducted during this time? Everyone was repeating the work of others. The thinking was, "If it is research -- it has to be beneficial." What a waste of talent, time and money! Little new information or new knowledge was produced. Research, conducted in this manner, is a bottomless pit and we in the turfgrass industry can no longer afford it. We must be very careful not to fall back into this pattern in the next decade.

And now another era is before us. By joining together, the golf course superintendent, the USGA Green Section and the university researcher can take monumental strides forward. By pooling our resources and coordinating our efforts, we <u>can</u> influence turfgrass research and guide it into productive channels. The common bond between GCSAA and USGA Green Section has grown encouragingly closer in recent years. It is the product of a more professional golf course superintendent and a recognition of that fact by the USGA and all club officials.

To guide this cooperative turfgrass research effort in the proper direction, a Research Committee was formed in 1983 and consists of some of the most knowledgeable, widely traveled, broadly experienced and unbiased turfgrass experts in the world. Drs. J.R. Watson, Paul E. Rieke and Marvin H. Ferguson (until his untimely death in early January, 1985) formed the backbone of the Committee. Dr. Victor Gibeault of the University of California, Riverside, has recently been appointed to served in Dr. Ferguson's place. In addition, each year a young turfgrass scientist is appointed to the Committee for a one year term. This adds to a greater understanding and we believe a solid base for future progress. This year, Dr. Karl Danneberger of Ohio State University is participating.

I am happy to report that the GCSAA has been represented by Gerry Faubel, Chairman of the GCSAA Scholarship and Research Committee and a Golf Course Superintendent from Michigan. In addition, Jim Prusa, the Associate Director of the GCSAA also serves as a permanent member of the Research Committee. On the Green Section side, James Moncrief and myself (representing over 60 years

of turfgrass experience) represent the USGA. We also have three administrators including Frank Hannigan, Executive Director of the USGA; George Bard, Green Section Committee Chairman and C. W. Smith, USGA Director of Administration.

This Committee has formulated a plan for the development of Minimal Maintenance Turfgrasses for Golf. Through this plan and a cooperative research effort, we believe it is possible to reduce water use and overall maintenance costs on golf courses by 50 percent within the next decade. We believe this can be done, but the USGA cannot do it alone. It will take millions of dollars over the next ten or so years; it will take that kind of money from all of golf if we are to be successful. And that is why provincialism and fragmented efforts have not worked in the past and why they must be avoided in the future.

This long term turfgrass research effort is the most comprehensive and substantially funded undertaking of its kind in the history of agriculture. The breeding and cultural studies will require ongoing and increasing funding in the years ahead. Additionally, new projects are anticipated and will be added as funds become available. Widespread public recognition will be given to all those organizations and individuals supporting this cooperative undertaking.

It is the Research Committee's intention to bring a greater sense of direction, cost effectiveness and concentration to the vital areas of turfgrass research for golf. It intends to establish specific agreements, monitor expenditures, set certain expectations, insure proper progress and to be accountable to those providing funds. The Committee's entire purpose is to establish a sound program, closely follow its progress and achieve the states objectives.

While other organizations in golf and in the turfgrass world will have their own self-interests to serve, representatives of those organizations and institutions are asked to embrace the spirit of cooperation that the USGA and GCSAA are attempting to promote and that, together, we will work cooperatively and understandingly toward better turfgrasses for all of golf for tomorrow. The Game deserves nothing less!!

GROWTH REGULATORS FOR ANNUAL BLUEGRASS MANAGEMENT AND CONTROL

by
Bruce E. Branham
Michigan State University

Plant growth regulators for turfgrass have been available for the past 30 years. However, until introduction of mefluidide (Embark) in 1978, no PGR had yielded acceptable aesthetic quality with good vegetative and reproductive growth suppression. Currently, there are two PGR's in the marketplace that provide good to excellent vegetative and reproductive growth suppression. Currently, there are two PGR's in the marketplace that provide good to excellent vegetative and reproductive growth suppression while maintaining fair-to-good visual quality. These two materials flurprimidol (EL-500 or Cutless) and paclobutrazol (PP-333) are still experimental products. These two PGR's have a different mode of action as compared to mefluidide and amidoclor in that they inhibit gibberellic acid biosynthesis. GA is a plant hormone responsible for cell elongation and thus plants treated with these two PGR's continue to produce new cells but without elongation. Seedheads are produced, however, they don't elongate. In addition, there are antidotes to these herbicides; applications of GA to treated plants will completely overcome the growth suppression.

Growth regulators have typically been used with the idea of eliminating mowing for 6 to 10 weeks. This may be desirable on low to medium quality turf such as roadsides, low traffic parks, and non-trafficked commercial sites. For higher quality turf, no PGR currently exists which can give 6 to 10 weeks growth suppression while maintaining acceptable quality.

By using reduced rates of the PGR, the period of growth suppression is reduced. HOwever, the phytotoxicity from PGR applications, normally seen as turf thinning and discoloration, is also reduced. Many superintendents in Michigan use mefluidide for annual bluegrass seedhead control at rates of 6-8 oz. product/A (0.09-0.125 lbsAI/A). These rates give good annual bluegrass seedhead control while reducing mowing frequency to once every one to two weeks in the early spring. Similar results should be obtained on kentucky bluegrass turf whether fairway or home lawn.

One PGR, flurprimidol, shows promise for selective removal of annual bluegrass. Flurprimidol seems to work by selectively retarding annual bluegrass more than other grasses. This should allow other grasses to compete more favorably with annual bluegrass and eventually crowd out the annual bluegrass. Observations in the field seem to

indicate an increase in creeping bentgrass turf when treated with flurprimidol. Unfortunately, we have not been able to document any effect of flurprimidol in increasing the percentage of creeping bentgrass turf. A study was initiated in 1984 to examine the effect of five management practices on the competition between annual bluegrass and creeping bentgrass. One of the factors was plant growth regulator with three treatments consisting of flurprimidol at 1.5 lbsAI/A, mefluidide at 1/8 lbAI/A, and a check; measured population shifts saw a 2.25, 0.65, and 4.03 percent decrease in the annual bluegrass populations, respectively, from the three treatments. The fact that the check plot showed a larger decrease in annual bluegrass than the plots treated with flurprimidol indicates that after one year flurprimidol had no effect on annual bluegrass populations. A second study was initiated in the spring of 1985 to examine different rates and timing of flurprimidol applications. The data shown in table 1 were taken on August 12, 1985. The spring treatments were applied on May 15 and the fall treatments had yet to be applied. The results show that no increase in creeping bentgrass cover could be attributed to flurprimidol.

Both of these studies have only been conducted for one year and flurprimidol may cause a subtle change in the turfgrass stand composition over the course of several years. However, at this time it appears that flurprimidol does not cause a significant reduction in annual bluegrass population in our research plots.

Table 1. Change in area of "Penncross" creeping bentgrass plugs in annual bluegrass after treatment with Cutless at different rates and times. Measurement obtained on 12 August 1985. Hancock Turfgrass Research Center, East Lansing, Michigan

Treatment	Cutless Rate & Timing	Mean of 3/Plugs Plot (cm^2)	% Increase/Decrease From Check
1	1.5#/A Spring (May 15)	76.3	5.3
2	1.5#/A Fall (August 15)	84.3	14.7
3	1.0#/A Spring	77.1	6.7
4	1.0#/A Fall	77.9	5.3
5	0.5#/A + 0.25#/A + 0.25#/A Spring (May 15, June 1, June 15)	77.8	7.0
6	0.5#/A + 0.25#/A + 0.25#/A Fall (August 15, August 30, September 15)	68.0	-5.3
7	0.5#/A + 0.5#/A Spring (May 15, June 1)	77.3	6.3
8	0.5#/A + 0.5#A Fall (August 15, September 1)	77.4	9.7
9	1.0#/A + 1.0#/A Spring, Fall	87.0	16.7
10	CHECK	71.7	0.0

NOTE: Based on the analysis of variance (AOV) no statistical differences were noted on this evaluation date.

COPING WITH SALINITY AND SODIUM

by
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New Mexico State University

Salt-affected soils are common in arid and semi-arid regions where annual precipitation is insufficient to meet the evatranspiration needs of plants. As a result, salts are not leached from the soil. Instead they accumulate in amounts or types detrimental to plant growth. Salt problems are not restricted to arid or semi-arid regions, however. They can develop in sub-humid and humid regions, or well-watered turf areas under appropriate conditions.

Many present day salt-affected soils result from man's activities. For example, salts commonly are transported from areas of over-irrigation to accumulate in poorly drained areas. Indeed, drainage is absolutely critical to the continued success of irrigated agriculture in general, and irrigated turf in particular. Proper irrigation management includes periodic irrigation with water in excess of plants needs, in order to leach accumulated salts from the plant root zone. When drainage is restricted, leaching is impaired and salt damage may follow. Maintaining the physical and chemical properties of a soil to allow for adequate drainage is thus a prime prerequisite of a soil for salinity control. Soil amendments such as acid or gypsum may be useful when accumulations of sodium reduce soil permeability, but are largely ineffective if the problem is physical.

The main effect of soluble salts on plants is osmotic, since high salt levels make it difficult for plants to obtain water for plant growth. The effect of salinity on plants appears primarily to be energy diversion from growth processes in order to maintain sufficient osmotic differential between the soil and plant root to allow for water uptake. The relative growth of plants in the presence of salinity is termed salt tolerance and is essentially a measure of a plant's ability to osmotic adjust. Salt tolerance data for selected turfgrasses are given in Table 1.

The success of a turfgrass project will depend upon the quality of water available, the turf species selected, water management (leaching) and maintenance of adequate drainage. There are no "miracle chemicals" that will insure success, but good agronomic practices will suffice where miracles fail.

Table 1. Salt tolerance data for selected turfgrasses

Species	EC (mmho/cm at 25 C) for yield decreases of 10%	25%	50%
Agrostis palustris, Seaside	3.5	6.0	9.0
A. Tenuis, Highland	1.5	2.5	5.0
Cynodon, Tifgreen	2.5	4.5	17.0
Cynodon, Tifway	7.0	11.0	15.5
C. dactylon, "Common"	4.0	7.0	13.0
C. dactylon, Ormond	5.0	7.0	13.0
C. dactylon, U-3	2.5	5.0	13.0
C. magennisii, Sun turf	7.5	12.5	17.5
Poa pratensis	2.5	4.0	7.5

ORNAMENTAL LANDSCAPE PLANTS FOR THE SOUTHWEST

by
James R. Sais
New Mexico State University

The southwest is unique in its climate. Brisk winds, bright sun and altitude changes offer challenges in selection and care of ornamental plants used in landscaping.

In choosing plants for the southwest landscape be aware of the following:

1. Winter Injury - Most plants used in the southwest can be affected by winter injury. Many plants tolerate low temperatures, but are damaged when winter temperatures are warm and sunny, followed by sub-zero temperatures.

Plant injury may occur by damaging or killing plant tissue on the south or southwest side of the plant. In trees, crotches are prone to winter damage. Likewise, alternate freezing and thawing takes its toll of plants each year.

2. Soils - The soils in the southwest are alkaline, narrowing choices for landscape plants even more.

High salt content of the soil may cause burning of plant foliage while any pH elevations tie up certain plant nutrients. Iron, and in some cases zinc, can become tied up and unavailable.

3. Water Requirements - Water cost and availability are prime considerations in choosing plants for southwest landscaping. In general the southwest is characterized by low rainfall and long dry periods. Plants should be grouped according to water requirements and drought tolerance.

Knowing when and how to water specific plants becomes an important management practice in growing landscape plants.

For descriptions of specific plants refer to NMSU Circulars C447 "Ornamental Trees for New Mexico," C448 "Ornamental Shrubs for New Mexico," C449 "Ornamental Vines for New Mexico," and C444 Ground Covers for New Mexico.

BUDGETING FOR MAINTENANCE AND REPAIRS OF TURF AREAS

by
Warren Bidwell
Tee-2-Green Corporation

The profession of turf management has made a strong and continuing progress since the days of World War II. This has not come about by simply a change of job title, but rather by educating ourselves to apply the knowledge we have acquired form our Land Grant Colleges like New Mexico State University under Dr. Glover. Having both teaching and turf experimental plots, this combination provides a complete exhibit of all facets of our modern day Turf Management System. Budgeting then becomes an important part of all schools who teach Turf Management.

With plant breeding in the hands of Turfgrass Specialists it became possible to select bentgrass species that have heat tolerance. To establish the so-called "cool season" grasses in the deep southland, by overseeding the Bermuda, the tolerant species with the all season, cool season potential has just about eliminated the necessity of depending on Bermuda as a greens turfgrass. This procedure reduces the spring/fall transition each year and is considered to be kind to the overall budget. This has, in part, been made possible by the accepted practice of far less nitrogen per thousand square feet than has been the practice for many years. These accepted new practices have been very good for revised budgeting concepts.

Budgeting for maintenance and repairs of turf species used in all areas of recreational turf management has become a must for our survival. As it should be, the use of public or private funding for such areas must be accounted for at the end of the budget year before the final accounting can be approved and published. Such managerial skills go far beyond our acquired agronomic know-how. Understandably, this becomes one of the prime requirements of the Turf Manager. Therefore, formulating and managing the funds to produce excellent playing facilities stands equally tall in the minds of those who provide such funding.

The cost of maintaining and repairs for large acreages of turfgrass often vary from one season to another, depending on the specific area involved. When such a variance does happen, it is likely to be a weather factor. Climate in this area may vary little from one season to the next. Not so in the Midwestern states.

Thousands of acres of turf and non-golf related play a very important role in recreation for our society. Unfortunately most of them are not adequately funded for the role they are expected to perform for the community in which they are located.

Community or regional, multi-use parks go far beyond their intended use by stretching the budget to the very limits, often failing in an attempt to fully serve the multitudes for lack of adequate funding. As one might suspect, the funds available for adequate equipment and material to do the job properly becomes part of the sad story and, as a result, the park facility never reaches it's potential in serving the community. The end result is criticism.

Then, there are those major sports stadiums that are multi-purpose facilities. Some are privately owned by investors, others by state institutions or cities. These stadiums are designed to host various events, thus fare better financially without having to account to the tax payers. Some, like the Purdue University stadium and the Orange Bowl have high content of sand as a growth medium and the PAT system of construction. Budgeting for maintenance of such installations becomes almost an exacting science since everything is controlled by the turf manager.

On visiting the Orange Bowl last November, it soon became quite obvious that the Turf Manager had to be a man of many, many talents. First of all, everything that goes on at the Bowl is evaluated from a financial view point. The Michael Jackson concert had just departed their two night stand in Miami, hosting an average of 63,000 for each show. "Everything is budgeted," said Dale Sandin, the Bowl supervisor. "We had to set up seating near the performance platform out on the playing field." The heavy plywood was being removed that had been placed on the field to protect the 328 Bermuda. Such specialties are expensive, but they were willing to pay the price.

The American business system is predicted on the Budget System. Calculators and computers are a part of the Turf Management and Budgeting System, regardless of the business purpose for which they are being used. More and more turf managers depend on them to keep an on-going budget for maintenance and repairs report up to date.

GOLF COURSE MANAGEMENT

by
Guy Wimberly
New Mexico Golf, Limited

A. From the Player's Viewpoint

1. Course Management
2. When to Hit the Driver
3. When to Hit the Iron
4. How to Strike a Putt Firmly

B. The Superintendent's Viewpoint

1. Weather Conditions
2. Height of the Cut
3. Topdressing
4. Water: Natural & Artificial

C. Through the Eyes of the Club Manager

1. Hours of Operation
2. Tournament Schedules
3. Setting up the Banquet
4. Speaker Information

D. The PGA Golf Professional's 20-20 Vision (or is it 20-200?)

1. Tee Times
2. Hours of Operation
    a. Public vs. Country Club
3. Public Relations Expert
    a. Speed of Play

LONG LIFE OF AIR COOLED ENGINES THROUGH SERVICE MAINTENANCE

by

Grady Tunnell

In order to understand Air Cooled Engine maintenance better, we will compare car mileage and maintenance to R.P.M. (as mileage) of air cooled engines to maintenance.

A. Type of Fuel

B. Type of Oil

ENDOPHYTES IN TURFGRASS

by
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The term endophyt means a plant living within another plant. Today we know of two endophytic fungi found in turfgrasses, namely, Lolium endophyte in ryegrass and Acremonium spp. in fescues.

The relation between the fungi and the grass is symbiotic. Where the fungal mycelium (thread) grows in the intercellular spaces of the host plant, but has not been observed to penetrate the cells. Endophyte mycelia grow between host plant cells in all parts of the grass except the root system, and is transmitted by the seed and vegetative propagation of infected grasses. however, the viability of the endophyte was lost in seeds that were stored more than 18 months while dry cold storage of grass seeds prolonged fungus viability several years (7,8).

The grasses benefit from the presence of the endophyte is complex and involves improved persistence, increased tolerance of stress, resistance to insects, and improved regrowth (1,3,8). Resistance to sod webworm, and to Argentine stem weevil is closely associated with the presence of endophytes in perennial ryegrass (2). The resistance to these insects is a result of the production of neurotoxins (lolitrems) in endophyte -- containing ryegrasses and pyrrolizidine alkaloids in tall fescue. It is not clear if these toxins are produced by the endophytes or the grass is producing phytoalexins as a reaction to the fungus. One thing for sure, the toxins could not be extracted from the fungus when it was grown on artificial media (7). The benefits of endophytes can be greatly increased if their presence or the production of the toxins can be extended to the root system. That may result in. controlling root feeding insects such as the grubs.

In spite of all these benefits there are some disadvantages to the endophytes. They cause the choke disease in fine fescues, where the mycelia grow up into the seed stalk blocking the water supply and causing the stem to die (1,4).

Another disadvantage, although not concerning turf managers, is the toxins production associated with endophytes. It was found that alkaloids produced in endophyte-containing tall fescue are responsible for the disorder known as summer syndrome in grazing cattle. Ryegrass staggers is another disorder caused by the neurotoxins lolitrems. These disorders occur only during periods of drought stress, heat and over grazing (7).

To the turfgrass manager, this wealth of knowledge about endophytes means the future promises new varieties of ryegrass and fescues that are highly resistant to insects, disease and are high performers as well as having good recouperative qualities (4). Even right now there are several varieties available commercially which possess these qualities. These varieties include Repell, Pennant, Regal and Citation II, to mention a few (5,6).

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CONTROL OF SMALL ANIMALS

by
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Small mammals often are undesirable in turfgrass areas. Their digging activities and the resultant soil displacement often poses problems with mowing, irrigation or desired appearance of turfgrass. The three animals most often responsible for damage are pocket gophers, ground squirrels and skunks. By using proper techniques in a timely manner, problems can be minimized.

Pocket Gophers

Just as cheek pounces are used in identification of pocket gophers, their fan-shaped soil mounds are characteristic evidence of their presence. The gopher uses it forefeet and chest to push the soil out of its burrow and parallel to the ground surface, with a variable number of lateral burrows off the main. These end at the surface with a soil mound or sometimes with only a soil plug.

The most common control methods for pocket gophers include poisoning and trapping. The key to the efficient and effective use of these methods is locating the main burrow system. The main burrow generally is found 12 to 18 inches away from the plug on the fan-shaped mounds. A probe of 3/8 inch steel rod can be used to locate the main tunnel. You will know you have located a burrow by the decreased friction on the probe.

The most widely used poison is strychnine alkaloid (0.31 to 0.5% active ingredient) on grain baits. Strychnine acts very rapidly and gophers sometimes die within an hour after consuming a lethal dose. Dig down to the main burrow and place a rounded tablespoon on bait well into each direction of the tunnel system with a long-handled spoon. Block off each tunnel with sod clumps and soil to prevent the pocket gopher from covering the bait with soil as it plugs the opening. The bait will maintain its effectiveness for at least 2 weeks, and most bait is eaten during the first week.

Bait can also be placed in a burrow system by using a special hand-operated bait dispense probe. These are available commercially or can be built using 1/2 inch pipe. Be sure to follow label directions on all toxicants.

Trapping is extremely effective to control pocket gophers on small areas and to remove remaining animals after a poisoning control program. It is recommended that 2 traps be set in the main runway so the pocket gopher will be caught coming from either direction. Traps can be

marked aboveground with engineering flags and should be anchored with a stake and wire or chain. Trapping is most effective when gophers are pushing up new mounds, generally in spring and fall. If a trap is not visited within 48 hours, move it to a new location.

Ground Squirrels

The spotted ground squirrel and the thirteen-lined ground squirrel usually cause damage when they burrow in well-maintained lawns and other grassy areas or divert the flow of irrigation waters. Traps, toxicants and fumigants are most commonly used to control ground squirrels.

Rodenticides currently provide the cheapest and most effective method for controlling ground squirrels in large areas. Registered products include strychnine and zinc phosphide. Both are Restricted Use Pesticides. Newly developed anticoagulant rodenticides, first developed for rat and mouse control, have potential and are being labeled for more field rodent uses. A pelleted grain baiting containing 2% zinc phosphide is also registered. Grain baits are most effective in spring or late summer when ground squirrels are gathering seeds in the cheek pouches.

To avoid hazards to game birds, domestic poultry, or other wildlife, placed poisoned grain directly into the ground squirrel burrows. Follow label instructions to the letter. Placement, quantity of bait, timing and handling instructions will vary among toxicants.

Ground squirrels can be killed in their burrows by suffocating gasses. DO NOT fumigate burrows under or around buildings. The fumigant could seep into buildings and create a hazard for occupants. Fumigate during spring, summer and early fall before ground squirrels plug their burrows with soil prior to hibernation. Commercial, easy-to-use gas cartridges are available from hardware stores, U.S. Fish and Wildlife Service supply depots, garden supply centers, or seed catalogues.

Several types of traps are effective. Box traps, body-gripping traps or simple wooden-base snap-type, rat traps are all effective. The triggers can be baited with peanut butter, grain, nuts or whatever type of food the ground squirrels are eating. Secure solid baits (like nuts) to the trigger with a thread or wire. Place the traps near burrow, along runways, or where damage is occurring. To be most effective, bait and place the traps unset for several days to allow the ground squirrels to get used to them, then set the traps. Check traps frequently.

Skunks

Skunks become nuisances when they dig holes in lawns, golf courses and gardens to search for insect grubs found beneath the ground surface. Digging normally appears as small, 3- to 4-inch cone-shaped holes or patches of upturned earth.

When fencing is not practical to exclude the skunks, live traps are usually used to remove them from the area. Skunks can be caught in live traps set near the entrance of their den. Skunks frequently are taken in traps using canned fish-flavored cat food as bait.

A canvas should be used to cover the trap before setting it to reduce the chances of the skunk discharging its scent. A person may approach a trap slowly and quietly without upsetting a trapped skunk and gently remove the trap. The skunk can be released or killed. If it is to be released it should be transported at least 10 miles and released in a habitat far from human dwellings. If the skunk is to be killed, gently lower the trap into a tank of water to drown the skunk.

PESTICIDE REGULATIONS

by
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New Mexico Department of Agriculture

Pesticide regulations affect everyone who applies pesticides and it depends on several factors as to what degree it will affect the applicator. These factors include your type of employment and the classification of the pesticide.

Commercial Pesticide Applicators: If an individual applies pesticides for hire, the New Mexico Pesticide Control Act requires that individual be licensed and certified as a commercial pesticide applicator. The requirements for a commercial pesticide applicator are two years experience, passing the appropriate exams and obtaining a liability certificate of insurance to cover their spraying operation. Anyone applying pesticides for the commercial pesticide applicator also needs to be licensed as a commercial operator.

Noncommercial Pesticide Applicator: A noncommercial applicator license is required for an individual who purchases and uses a restricted use pesticide in his duties of applying pesticides to the private property of the company or it could be a private golf course. No experience is required nor is an insurance policy required. Individuals applying pesticides under the supervision of a noncommercial applicator need not be licensed. If restricted use pesticides are not used, no license is required; however, it would be advantageous in the liability aspect to have someone certified and licensed.

Public Applicator: A public applicator license is required for an individual who is employed by a municipality, city, state or federal agency and uses a restricted use pesticide as part of their duties. This license can only be used in their employment duties.

All three of the above licenses require the applicant to take and pass exams to become certified and licensed.

Classification of Pesticides

The U.S. Environmental Protection Agency classifies pesticides into two categories -- general use and restricted use. General use pesticides are those products considered safe enough to be used without special training and can be purchased and used by anyone. Restricted use pesticides can only be purchased and used by certified and licensed applicators. Pesticides are designated restricted use by EPA for various reasons which include toxicity or

having an adverse impact on man and the environment. To prevent a pesticide from being mishandled or misused, they are classified as restricted use pesticides. Then only those individuals who demonstrate a minimum amount of competency are licensed through the testing procedure. On the front panel of a restricted use pesticide label the wording states that only licensed applicators can use that product.

At the present time there are approximately 150 pesticides which are labeled for restricted use. Continually more pesticides are being added to this list. By this time next year, Furadan and Di-Syston granules will become restricted use products. Of the 34,000 pesticides EPA has registered in the United States, very few have been reviewed for classification.

The state of New Mexico also has an additional list of restricted use pesticides that are primarily used by pest control operators. In the past, many problems have arisen because of misuse by the average home owner so these products have become state restricted. Both EPA and state restricted use pesticides are unavailable to an unlicensed person as pesticide dealers are required by regulation to request an applicator license before selling the product. A record of all sales of restricted use pesticides is kept by the dealer and submitted to the New Mexico Department of Agriculture.

Disposal

There are many questions about the regulation of pesticide disposal in the minds of pesticide users. Considerable confusion exists about the EPA regulation of pesticide disposal. A lack of a clear understanding of the two federal laws administered by EPA is one reason for all this uncertainty.

The two federal laws that govern the disposal are the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Resource Conservation and Recovery Act (RCRA). Regulations promulgated under these two legislative acts, particularly RCRA, are quite comprehensive and in a state of continual change. Each of the two laws have a place in the overall system of regulating pesticide disposal. The state law regulating hazardous waste is the New Mexico and it is enforced by the New Mexico Environmental Improvement Division. However, the NMDA enforces the pesticide part when it becomes a hazardous waste. At the present time, there are no hazardous waste disposal sites in New Mexico and there are not any in the planning stage.

PREVENTIVE MAINTENANCE

by
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For years equipment manufacturers have supported their products with operators manuals, repair/overhaul manuals, parts manuals containing pages upon pages of charts, lists and information on items to check, components to maintain, all in the hopes of prolonging equipment life. But, it hasn't been until very recently that we've begun to see the real meaning and benefits of preventive maintenance.

Since funds are tight, labor expense high, regulations stiffer, budgets less and having backup units available a thing of the past, there exists a need and MUST for gaining the greatest productivity, safety and economy as well as extending the useful life of the equipment.

How? Through preventive maintenance. Preventive maintenance, or PM, is that maintenance performed to prevent malfunctions and parts breakdowns by periodically and systematically checking equipment and its systems. Preventive maintenance will cut back corrective maintenance.

Failures usually occur when the equipment is needed the most and it will occur when the tractor is the farthest away from the shop. Unexpected failures result in lost productivity, lost man hours and lost time. It also puts an added drain on our budgets and costs increase.

A program involves more than the usual periodic adjustments, cleaning, lubrication and oil changes. Let's break it down. This can be broken down into four groups. SCHEDULING -- INSPECTIONS -- LUBRICATION -- REPAIR.

SCHEDULING. Each machine should be scheduled for PM according to hours used and severity of its use. Set your schedule according to your operating needs. Use the manufacturer's recommended PM periods as a starting point -- then alter it according to your operating needs. Once a schedule is developed stick to it, don't let it slide.

INSPECTIONS. Inspections of the equipment should be an ongoing task. For example, an operator performing the pre-operational checks is a form of inspection.

While performing PM tasks the individual should always be alert to conditions that may seem abnormal. A determination then must be made, either correct it immediately or schedule the equipment in for repairs. Remember, a tractor and/or related systems will always give some indication prior to it failing. We just have to learn

the signs -- chaffed, cut or pinched hoses; loose hydraulic connections; bent linkages; missing bolts, nuts, hardware; loose or disconnected wire (safety); missing guards or shields, etc.

LUBRICATION. We all know the important of oil in an engine and lubricant in gearboxes and on moving parts. It is important to lubricate machines on a regular basis. The lubrication schedule can be altered to fit your needs. When using oil, lubricant and filters be sure to use what the manufacturer recommends to gain maximum protection.

REPAIR. Repair is considered a part of preventive maintenance. The repair we are speaking of is that repair performed due to wear under normal operation. When using the word "normal" we mean normal for your particular condition. Because of the wear factor repairs must be performed to keep equipment in top operating condition. When repairs are handled in a prompt, efficient and correct manner we begin to see a decrease in major equipment failures and decrease in operational costs. At the same time we see an increase in the equipment's performance availability.

Record keeping is a very important and most often a forgotten part of the preventive maintenance program.

I'm sure we'll agree that we want to keep our PM record system simple. Don't fall prey to a complex involved system. It may look great and work today, but when things get busy then it gets time consuming and difficult to keep up.

There are as many different PM record systems as there are machines. Design your system to fit your operation and company structure. The PM record system should also be designed to gain a return for both you and your organization. Think of what you would like to see from this program a month, six months and a year down the road.

Take a look at what's needed to begin developing a PM program. To begin is perhaps the most difficult part of the PM program. Begin by reviewing the manufacturer's information about the equipment. What do they recommend as maintenance.

Develop an easy to follow check list of PM tasks for each period -- daily, monthly, yearly. Review your shop's operating schedule and compare it to the operating schedule of the equipment. Schedule the equipment in the shop during its normal off-period. Allow ample time to perform all the tasks called for that PM period -- weekly, monthly, semi-annually, etc.

Develop a simple service order system. This will be used by the person who performs the PM tasks. The work order should identify the following:

-- Machine name and/or number
-- Hours on machine
-- What PM period is being performed
-- Discrepancies that were corrected/ description
-- Discrepancies that require shop repairs
-- Quantities of materials used; oil, lube, etc.

This form should be made up of an original and one copy, minimum. Original always should be filed in a PM record folder. More copies can be added depending on your needs.

Set up a PM or Machine History file. A manila folder is ideal. Important information should be typed or written on the inside cover of the folder. This way you have easy access to the information and it will not be lost. From here on any invoices, service orders and other pertinent information can be filed in this folder. A permanent record of activities has now been established for the equipment.

What can you expect from a PM program?

A. Saves operating cost
B. Less down time
C. Cost control
D. Long life expectancy
E. Better and longer operating quality
F. Safety
G. Better means of budgeting
H. Justification
I. Less inventory of product to perform job

When is a good time to start? NOW!!