

NORTHERN MICHIGAN TURF MANAGERS ASSOCIATION

James B. Beard
FRANK HEMINGER, SECRETARY-TREAS.

TUESDAY, MAY 17th, 1983
Manistee Golf & Country Club
Manistee, Michigan

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TRAVERSE CITY, MI. 49684
PHONE: 616-947-9274

Our first meeting for this 1983 season will be held at the above indicated location. This is a Tuesday, lunch will be available in the club house for those coming to play golf, may we suggest that you plan your day so that you will have time for your game, relation, and ready for dinner at 6:00 P.M. Our business meeting will follow dinner so that we can conclude early enough for all to get home at a reasonable hour.

Mr. Mike Doan is the Golf Professional-Superintendent-Manager of this fine country club and he invites you to play this challenging golf course. It is one of the older golf courses in Northern Michigan and you will enjoy the beauty along Lake Michigan. Don't forget however the two dollars needed to enter into our golf tournament so that you may take home a very nice prize, if ----- you play well.

As usual, we are enclosing a postcard for you to return telling us that you will be there or not. This is necessary so that the Country Club will know how many will be there fore dinner. Again this year, we will give a prize for returning postcards, you do not have to be present to win, and the winner will be drawn from the postcards received at the meeting. If you don't send in your postcard, you have no chance of winning so NOW make up your mind and mail that card.



We are fortunate this year in having as our speaker, Mr. Robert A. Moore, President of Aquatrols Corporation of America. Bob is probably the outstanding authority on wetting agents in the country and if you have compaction problems, hard greens, dry spots on your fairways, water will not penetrate, this will be a fine time to get answers. The use of wetting agents or surfactants is getting larger every year and is now being distributed all over the world. Its use is not confined to golf courses alone but is being used more and more in nurseries, hot houses, labratories, farms and so forth with new plantings and crops.

1983 membership booklets have been mailed under separate cover by third class mail. You should have your copy by the time of our first meeting, however if per chance you do not, additional copies will be available. If you do not attend this first meeting, a copy can be procured by contacting either our Sec.-Treas. or Tuck Tate. Hemingers phone number is listed above and Tuck can be reached at 616/352-4101.

We would be remiss if we did not tell you that this booklet was made possible only by the people that have advertised in it. Without their cooperation and help, there would be no membership booklet. We therefore suggest, that when you are contemplating your purchases for 1983, that you will keep these people uppermost in your mind in appreciation for their gracious cooperation.

We also would like feedback on this publication and would welcome any suggestions to improve it. If you think something should be added or deleted, your suggestions would be appreciated. This year in particular, we would like someone to contribute their assistance in publication and/or our monthly notices which we send out. Anyone interested, please contact our editor "Tuck" Tate. Thanks.

ENERGY.
We can't afford
to waste it.

SOILS AND HERBICIDES
Department of Horticulture
R.R. Romanowski and G.F. Warren
Purdue University

In agriculture we apply many of our herbicides to the soil surface before weed emergence. It is very important to understand the many factors that influence the activity of herbicides after they are applied to the soil surface. The following are some ways in which soil herbicide activity is reduced.

1. Volatilization—influences the activity of herbicides in many ways. One important way is the loss of herbicides from the soil surface as a vapor. The loss as vapor can result in a considerable reduction in effectiveness of a herbicide. Vapor losses of herbicides from the soil surface may also cause damage to sensitive crops growing in an area.
2. Leaching—is the movement downward of a chemical in the soil profile. Leaching is influenced both by properties of the herbicide and the properties of the soil.
3. Adsorption—onto the soil particles, greatly influences the activity of herbicides. Adsorption will prevent a herbicide from moving through the soil; however, it can also bind a herbicide to a soil particle so that it will not be available to control weeds. The following factors are important in adsorption on the soil:
 - A. Herbicide factors
 1. Nature of the herbicide
 2. Solubility of the herbicide in the soil solution.
 - B. Soil Factors
 1. Organic matter—is the most important variable in soil adsorption. Herbicide adsorption is directly related to the amount of organic matter in the soil. Higher rates of herbicides must be used on soils high in organic matter.
 2. Texture—can be important in soil adsorption. Clay soils adsorb higher amounts of herbicides than sandy soils.
4. Microbial—degradation of herbicides also influences the soil residual of herbicides. Soil microorganisms as algae, fungi, and bacteria can use herbicides as food for energy and growth. Some herbicides are readily decomposed by soil microorganisms, whereas others resist decomposition.
5. Photodecomposition—can be important in reducing the effectiveness of herbicides. Photodecomposition is the breakdown of a herbicide by light. The breakdown by light can be especially important when herbicides remain on the soil surface for extended periods of time. The movement into the soil by rainfall or irrigation will often reduce decomposition by light.

6. Chemical breakdown—is another factor to consider for soil applied herbicides. Each herbicide has a certain pathway by which it is converted into other compounds. This depends on soil moisture, temperature, microorganisms, time, etc. It is a well established fact that some herbicides take a long time for chemical decomposition and this can often become a severe problem in soil carryover. (see separate sheet on Bio-persistence of Herbicides in Soil).

The above discussion is given with the intent that it will serve only as an introduction to soil factors that influence herbicide activity. The following are some practical applications of the above information.

RELATIVE WEED CONTROL WITH SURFACE VS. SOIL INCORPORATED APPLICATIONS WITH RAINFALL OR SPRINKLER IRRIGATION WITHIN A FEW DAYS AFTER APPLICATION

**Better on
soil surface**

DCPA (Dacthal)
chloropropham (Chloro IPC)
linuron (Lorox)
dinoseb

**About the
Same**

diphenamid (Enide)
atrazine (AAtrex)
naptalam (Alanap)
bensulide (Prefar, Betasan)
alachlor (Lasso)

**Better incorporated
with soil**

EPTC (Eptam)
butylate (Sutan)
pebulate (Tillam)
vernolate (Vernam)
trifluralin (Treflan)
benefin (Balan)
isopropalin (Paarlan)
dichlobenil (Casoron)

MOVEMENT OF HERBICIDES IN PLANTS

R.R. Romanowski and G.F. Warren
Department of Horticulture
Purdue University

An understanding of the movement of herbicides in plants will be of assistance under field conditions to obtain better kill of unwanted weeds species. More herbicides will become available in the future that will be sprayed over crop plants to remove existing weed populations. As more selective post-emergence sprays become available it will be important to follow exacting directions as regards use. Undoubtedly, lower rates of some selective post-emergence herbicides will be applied more frequently. This principle alone merits a discussion of the movement of herbicides in plants.

Once an herbicide has penetrated the leaf or the root surface, there may be barriers to its movement to the site of the action. A number of herbicides are absorbed or otherwise inactivated in the roots or leaves and do not move to the other parts of the plant. Assuming the herbicide is not immobilized in the leaf or root, it moves in the plant primarily by one or both of two routes. These routes are generally referred to as **xylem** and **phloem**. The movement of herbicides taken up via the soil generally moves via the xylem and those applied to above ground parts of plants generally move via phloem and/or xylem tissues.

Xylem. Some herbicides that are applied to the soil generally move in xylem conducting ele-

ments along with the water supply. The xylem may be compared to water conducting pipes made of steel or plastic. The xylem is **nonliving**, hence some very toxic materials can pass through without injuring the xylem system. Some herbicides applied to leaves will move only toward the tips of leaves in the xylem along with the movement of water.

Phloem. Certain herbicides move in the phloem and xylem. One of the important features of 2, 4-D dalapon (Dowpon or Basfapon) and glyphosate (Roundup) is this ability to be transported in the phloem. Applications to the leaves can thus move to the roots of plants. Phloem movement is associated with sugar transport, therefore, good light conditions are helpful. Also, it is very important not to kill the leaf and stem tissues rapidly since transport is via **living** tissue. Rapid foliage kill will result in poor transport and poor root kill. Sometimes two or three doses of an herbicide of this type will give better results than a large dose that kills too rapidly.

A summary of the movement of certain herbicides in plants are contained in the attached table.

GENERAL MOVEMENT PATTERNS OF HERBICIDES IN PLANTS (ALL WILL VARY WITH SPECIES)

Applied to Foliage

Move in Phloem and xylem	Move only in xylem	Little or no movement
2,4-D MCPA 2,4,5-T silvex picloram (Tordon) dicamba (Banvel D) amitrole (Aminotriazole) dalapon (Dowpon, Basfapon) glyphosate (Roundup) MSMA DSMA	atrazine (AAtrex) prometryn (Caparol) metribuzin (Sencor, Lexone) monuron (Telvar) diuron (Karmex) linuron (Lorox) fluometuron (Cotoran) bromacil (Hyvar X) Terbacil (Sinbar)	chloramben (Amiben) dinoseb (Permerge or Sinox PE) diquat (Diquat) paraquat (Paraquat) chlorpropham (Furloe) nitrofen (TOK)

Applied to Soil

Move readily in xylem		Movement in xylem restricted
atrazine (AAtrex) simazine (Princep) prometryn (Caparol) metribuzin (Sencor, Lexone) monuron (Telvar) diuron (Karmex) fluometuron (Cotoran) linuron (Lorox)	bromacil (Hyvar X) terbacil (Sinbar) amitrole (Aminotriazole) dalapon (Dowpon, Basfapon) TCA chlorpropham (Chloro IPC) EPTC (Eptam) picloram (Tordon) dicamba (Banvel D)	2,4-D 2,4,5-T chloramben (Amiben) Little or no movement dinoseb (Premerge or Sinox PE) DCPA (Dacthal) trifluralin (Treflan) nitrofen (TOK)

(Continued)

**RELATIVE WEED CONTROL WITH
GRANULAR VS. SPRAY APPLICATIONS
TO THE SOIL SURFACE**

Spray usually better	About the same	Granular usually better
atrazine (AAtrex) simazine (Princep) DCPA (Dacthal)	naptalam (Alanap) CDAA (Randox) propachlor (Ramrod, Bexton) alachlor (Lasso) chloramben (Amiben)	EPTC (Eptam) vernolate (Vernam) butylate (Sutan) pebulate (Tillam) CDEC (Vegadex) dichlobenil (Casoron)

RELATIVE LEACHING OF HERBICIDES IN SOIL
(Compiled from research at Purdue and from the literature)

A. Readily leached in all soils. dalapon (Dowpon, Basfapon) TCA	CDAA (Randox) propachlor (Ramrod, Bexton)
B. Readily leached in low organic, sandy soils but with some resistance to movement in others. chloramben (Amiben)* dicamba (Banvel) 2,3,6-TBA	dinoseb bromacil (Hyvar X) terbacil (Sinbar) metribuzin (Sencor, Lexone)
C. Readily leached in low organic, sandy soils but considerable resistance to movement in other soils. 2,4-D* naptalam (Alanap) picloram (Tordon)	atrazine (AAtrex) simazine (Princep) propazine (Milogard)
D. Moderate movement in low organic, sandy soils but little or none in others. alachlor (Lasso) diphenamid (Enide) monuron (Telvar) EPTC (Eptam)	
E. Only slight movement in low organic, sandy soils and essentially none in others. diuron (Karmex) linuron (Lorox) vernolate (Vernam) butylate (Sutan) chlorpropham (Chloro IPC, Furloe) prometryn (Caparol) terbutryn (Igran)	DCPA (Dacthal) diclobenil (Casoron) bensulide (Prefar, Betasan) benefin (Balan) trifluralin (Treflan) napropamide (Devrinol) nitrofen (TOK) oxyfluorfen (Goal)

*Esters of these are less leachable than the amine or inorganic salt formations.

BIO-PERSISTENCE OF HERBICIDES IN SOIL
Approximate length of herbicidal activity under normal summer conditions in Indiana at dosages used for selective weed control in crops.

Less than one month 2,4-D naptalam (Alanap) cyanazine (Bladex) dinoseb (Peremrge or Sinox PE) propham (Chem-Hoe)	chlorpropham (Furloe) EPTC (Eptam) butylate (Sutan+) pebulate (Tillam) vernolate (Vernam) cdec (Vegadex)	CDAA* (Randox) propachlor* (Ramrod or Bexton) dalapon* (Dowpon or Basfapon) TCA* (Sodium TCA) nitrofen (TOK) glyphosate (Roundup)
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(Continued)

One to three months
 chloramben* (Amiben)
 dicamba* (Banvel)
 linuron (Lorox)
 metribuzin (Lexone or Sencor)
 chlorbromuron (Bromex or Maloran)
 chloroxuron (Tenoran, Norex)
 DCPA (Dacthal)
 alachlor (Lasso)
 pyrazon (Pyramin)
 prometryn (Caparol)

Three to six months
 atrazine (AAtrex)
 propazine (Milogard)
 diuron (Karmex)
 monuron (Telvar)
 trifluralin** (Treflan)
 isopropalin (Paarlan)
 oryzalin (Surflan)
 bensulfide (Prefar) (Betasan)
 diphenamid* (Enlde)
 dichlobenil (Casoron)
 benefin (Balan)

More than six months
 2,3,6-TBA*
 picloram (Tordon)
 simazine (Princep)
 prometon (Pramitol)
 bromacil (Hyvar X)
 terbacil (Sinbar)
 napropamide (Devrinol)

*In low organic matter soils these herbicides may have a shorter residual life if excessive rainfall occurs since they are readily leached.

**Breaks down faster under excessive soil moisture conditions.

Reprint Indiana G.C.S. Newsletter

GOLFER'S ETIQUETTE

"When to the links you go
 There are certain things to know.
 Never talk or hum or sing
 When a golfer starts to swing.
 Never let your shadow fall
 Across another's putting ball.
 Never doubt an opponent's score,
 You saw 6 but mark it 4!
 Never kick one from the rough,
 Play it fair when luck is tough.
 Never cheat in deepest wood,
 God is watching, so be good.
 Never raise your voice or swear
 When you top or fan the air.
 Never, even as a joke,
 Fail to count each single stroke.
 Don't improve a hanging lie
 "Accidentally" - on the sly.
 In a sand trap, it's a rub,
 Never, never ground your club.

The farmer killed a pig and hung it up for the night, intending to butcher it in the morning, but the next day it was gone. He didn't tell a soul about it, and nothing happened for more than two months. Then, another farmer who lived down the road came by and asked, "By the way, Josh, did you ever find who out stole your pig?"

"Nope," said Josh, "not till just now."

The instructor of the class in mechanics spoke to one of his students: "I am putting this rivet in the correct position; when I nod my head, hit it real hard with your hammer." The student did and the instructor woke up the next day in the hospital.

Sunshine Magazine

Being An Editor ...

Getting out this magazine, is no picnic.
 If we print jokes, people say we are silly.
 If we don't they say we are too serious.
 If we stick to the office all day,
 We ought to be around hustling material.
 If we go out and try to hustle,
 We ought to be on the job in the office.
 If we don't print contributions,
 We don't appreciate genius;
 And if we do print them, the paper is
 filled with junk!
 If we edit the other fellow's write-ups
 we're too critical;
 If we don't we're asleep.
 If we slip things from other papers
 We are too lazy to write ourselves.
 If we don't we are stuck on our stuff.
 Now, like as not, some guy will say
 We swiped this from some magazine.*

*We did!

CLEANING CONTAMINATED CLOTHING

Pesticides are great for getting rid of unwanted weeds and insects, but they aren't very good for humans. Chemicals are frequently spilled during mixing and it is sometimes impossible to keep them from drifting back on the operator during application. Because pesticides can enter the body through the skin, proper care in the laundry room is vital.

A recent study by researchers at Iowa State University Ames, showed that normal laundering is sufficient to remove 99.8 to 99.9 percent of the chemicals. Sample fabrics consisting of heavy cotton denim and a polyester cotton blend chambray were contaminated with Atrazine, a herbicide, and Thimet, an insecticide, then washed and dried using normal household procedures.

Clothing worn while applying pesticides should be kept separate from other clothing and washed daily, using the following procedure:

1. Store contaminated clothing in a plastic bag to await laundering or put them directly into the machine after they are removed.
2. Use hot water, 140 degrees Fahrenheit, with the machine set for normal or full water level.
3. Add recommended amount of heavy-duty phosphate based detergent.
4. Dry the clothes thoroughly in an automatic dryer at the regular fabric setting.
 Make sure no pesticides are left in the washer by running the empty machine through the complete laundering cycle, using detergent.

FOREFRONT

Praise is priceless—and costless.

JOB AVAILABLE *****
 Hidden Valley, Contact Mr. Pat Duffy, 517/732-5181, P. O. Box 556, Gaylord, Michigan 49735. Hidden Valley is both a fine golf course but is also well known as an outstanding ski resort. Details of position are not available.

The turfgrass program at M.S.U. is planning to expand their telephone "hotline" for this coming growing season. The Turfgrass Management Update was recorded on a weekly basis in 1982. The various turf problems which were addressed and the management suggestions which were supplied were limited in scope because of the limited number of people available to observe current turf problems. This year they hope to draw on people in the field as a resource to stay on top of developing disease and insect problems more efficiently.

This "hot line" service will begin on April 4th and continue through the growing season. Professional turf managers may get this service by calling 517/355-5221. Extension personnel may contact this number or through COMNET system. If further information is needed, please contact:

- Dr. Paul E. Rieke 515/355-0266
- Dr. Jos. M. Vargas 517/353-9082
- Shawn McBurney 517/353-9022

Our next meeting will be at the beautiful Garland Golf Club, Lewiston, on June 15th. This will be the 7th Annual Michigan Turfgrass Foundation Benefit Day, so start thinking about bring your own foursome or groups to participate. This tournament will be a "BETTER BALL OF 4 SCRAMBLE". Dave Longfield, golf course superintendent at Garland, promises a real treat and one of the finest tests of golf in Northern Michigan. SO----- act now and start putting your group together for a fine day.

Many golf course superintendents find in the spring that they have equipment which they either did not use last year or just want to sell. If you have anything that you would like to dispose of, we would be happy to include these items in our next letter however, you must advise our editor "Tuck" Tate. A brief description on a note would be the best way of advising him. You may or may not quote price or prices whatever route you feel best.

A better word for self-confidence is God-confidence.

Duncan Stuart



The person who can laugh with life has developed deep roots with confidence and faith—faith in oneself, in people and in the world, as contrasted to negative ideas with distrust and discouragement.
 DEMOCRITUS

A very little boy came home dejected from his first day at school.
 "Ain't goin' tomorrow," he said.
 "Why not, dear?"
 "Well, I can't read 'n' I can't write 'n' they won't let me talk—so what's the use?"

The Kleinknecht Encyclopedia

There are only a very few that have not paid their 1983 dues as yet. We would appreciate those few who have not, if you would mail your check to our Secretary-Treas. Frank Heminger. If any of you that have paid and have not received your 1983 membership card which is "orange", please let "Tuck" Tate know so that this error can be corrected.

The POSTCARD on our Manistee Country Club meeting, May 17th, send it TODAY. Thanks.