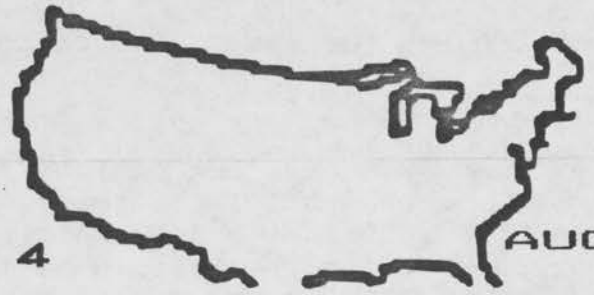
TURFCOMMS



V. 6, I. 4 AUG. 24, '91

PURPOSE: To pass on what we learn willingly and happily to others in the profession so as to improve turf conditions around the country.

SOME MORE ON RICE HULL COMPOST - Spent a day and a half with J. D. McMaster, who for the last 23 years has been selling this product out of Houston. Learned that this product could be used as is for the rooting of many cuttings. That when mixed with sand it produced a much more uniform product than when the same volume of peat was mixed with sand. This is confirmed by what I've seen in the field and what gentlemen from two different sand companies reported to me.

Rice hull compost when packed in the pit will support a dredge or a tractor trailer even though the water table is less than 10 feet below in the compost. It packs so firm yet retains so much pore space one wonders if you couldn't make a green out of pure compost. Pure rice hulls compost will support a luxuriant growth of bermudagrass.

McMaster also taught me how to do a quick check for the rice hull compost in a sand mix. Take a snowball size sample in your hand and then squeeze it like you were making a hamburger patty. The rice hull compost in the sand mix then becomes clearly visible.

ISOLITE - PRONOUNCED (ees-o-lite): Advertisements claim "upward to 50% water savings" - but turf researchers don't seem to be finding any. This product does have a good water holding capacity and does release the water back to the root. It may be of some use in localized dry spots. Dollar and cents wise you will probably be better off aerifying and applying a wetting

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agent. This product isn't quite the same as calcined clay - but, close to it.

REED SEDGE PEAT: There seems to be a lot of interest lately in this material as a soil amendment for greens. Janick in HORTICULTURAL SCIENCE 4th Ed. writes, "Its rapid rate of decomposition and low fiber content make it unsatisfactory for synthetic soil mixes." pg. 223. Madison in PRINCIPLES OF TURFGRASS CULTURE writes, "Sedge or reed peats are quite variable and may contain clay and silt up to 20%....Usually available from local deposits, sedge peat is less desirable than moss peat but low price may be a consideration." pg. 174.

Reed Sedge peat should not be your first choice and you should be aware of the possibility of a silt and clay percentage in any organic source. Having the organic matter ashed will usually provide you with a guide to the silt and clay content. Ideally there should be 10 percent or less left after ashing. Rice hulls is one exception. This material has a very high silicon content and usually ashes out at 21% with no silt and clay present.

PENNANT - Planning to use this new preemerge on bermudagrass collars, aprons, frog hair, banks of greens? DON'T if there is a bentgrass green where this material can move onto it with the runoff. Pennant is very water soluble and will move much like Kerb. This should also cause anyone planning to use this new preemerge in ornamentals bordered by any cool season grass to rethink their options. Also use on bermudagrass or zoysia fairways surrounded by Kentucky bluegrass or tall fescue might well result in a loss of turf on the downhill side of the fairway.

PESTICIDE UPDATE - Pages three and four of this issue of Turfcomms addresses a side of insecticide use that we as applicators need to be familiar with; that is the hazards of turf pesticides to non-target species. Or more specifically in this case, the danger to fish and birds from the pesticides we use. The interesting thing about this material is that it shows the pesticides that are very toxic to fish are not very toxic to fowl and vice versa.

This material first appeared in a recent issue of the Rocky Mountain Reporter. My apologies to the Colorado readers that are having to see it twice.

RELATIVE HAZARDS OF TURF AND ORNAMENTAL PESTICIDES TO NON-TARGET SPECIES

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One of the more publicly visible issues involving pesticide use on turfgrass and in landscape plant protection involves harm to desirable 'non-target' species, such as birds, fish, and other wildlife. Pesticide applications do have potential impact to harm these organisms - as well the intended target pest species (white grubs, webworms, billbugs, mites, etc.). Inadvertent wildlife kills can draw intense scrutiny to the applicator of pesticides, as indicated by the attention given diazinon-related bird kills on golf courses. Federal laws protecting endangered or threatened species of wildlife have cause further regulation of this issue.

Potential hazards to fish and birds are sometimes not well communicated on the label directions. Often some generic warning exists which does not give much appreciation of the relative hazard amongst the many other label warnings that tend to wash over the reader after time. However, it is in the interest of the turf care professional to become aware of potential special hazards associated with products so that problems can be minimized.

Methods used in determining toxicity of pesticides. The relative toxicity of various chemicals, including pesticides, is often evaluated in terms of their LD_{50} value. This is the lethal dose of the chemical which kills 50% of the test animals. The figure is adjusted for body weight of the animal and expressed as a number based on milligrams (mg) of pesticide required per kilograms (kg) of body weight. (This is equivalent to parts per million of body weight.) Effects of pesticides to fish and other aquatic organisms are measured somewhat differently. Instead, an LC_{50} value is given, based on the lethal concentration of the pesticide diluted in water. In these schemes, lower LD_{50}/LC_{50} values indicate higher toxicity.

Toxicity of turf and ornamental insecticides/miticides to birds. The insecticides most toxic to birds (Table 1) are primarily organophosphate insecticides such as diazinon, Dursban, and Mocap. Bendiocarb (Dycarb, Turcam) is the lone carbamate among the higher risk insecticides. Most of these insecticides are considerably more toxic to birds than to mammals. Diazinon, for instance is 100 times more toxic to birds (LD_{50} value 3.5 mg/kg) than for mammals (about 350 mg/kg), a few granules of the 14G formulation being a lethal dose to many birds. This insecticide typically carries a label indicating only moderate toxicity (Warning) whereas it would be in the highest risk category if risk to birds was the basis for label direction warnings. (Concerns about toxicity have recently resulted in more restrictive diazinon-product labels and most granular insecticides are currently under regulatory review.)

Toxicity of turf and ornamental insecticides/miticides to fish. Fish show a very different pattern of susceptibility to insecticides and miticides. The newer insecticides, pyrethroids (Talstar, Mavrik, Tempo) and avermectins (Avid), dominate the high risk insecticides to fish (Table 2). Most are extremely toxic to fish, at least in the clear water tanks in which these studies are conducted. For example, bifenthrin, the active ingredient in Talstar has an LC_{50} value equivalent to **1 teaspoon per 8,680,560 gallons of water**. (Manufacturers point out that pyrethroids bind readily to organic matter, so that actual risk in ponds is greatly reduced.) Many of the miticides (Pentac, Kelthane, Vendex) also show considerable toxicity to fish, whereas they are of much lesser risk as a group to mammals and birds. Organophosphates, so highly toxic to birds, generally fall towards the bottom among insecticides toxic to fish.

Table 1. Acute avian (bird) toxicity of insecticides and miticides used in tree and turf care. LD_{50} values for single feed acute toxicity of mallard ducks are given unless otherwise indicated.

Pesticide (Trade name)	<LD_{50} value>	Pesticide (Trade name)	<LD_{50} value>
Highly toxic to birds (equivalent to Category I-Danger/Poison label-pesticides for human exposure, oral LD_{50} 0-50)			
bendiocarb (Turcam, Dycarb)	<3.1 mg/kg>	diazinon	<3.5 mg/kg>
ethoprop (Mocap)	<4.2-61 mg/kg>		
Moderately toxic to birds (equivalent to Category II-Warning label-pesticides for human exposure, oral LD_{50} 51-500)			
isazophos (Triumph)	<61 mg/kg>	chlorpyrifos (Dursban)	<76.6 mg/kg>
avermectin (Avid)	<84.6 mg/kg>	acephate (Orthene)	<350 mg/kg>
Lower toxicity to birds (equivalent to Category III-Caution label-pesticides for human exposure, oral LD_{50} 501+)			
fenpropathrin (Tame)	<1089 mg/kg>	malathion	<1485 mg/kg>
bifenthrin (Talstar)	<2150+ mg/kg>	carbaryl (Sevin, Sevimol)	<2179+ mg/kg>
fluvalinate (Mavrik)	<2510+ mg/kg>	cyfluthrin (Tempo)	<5000+ mg/kg>
Pesticides of low toxicity to other birds but data for mallards unavailable.			
hexakis (Vendex)		dicofol (Kelthane)	dienochlor (Pentac)

Table 2. Acute toxicity of insecticides and miticides used in tree and turf care to rainbow trout. LC_{50} (lethal concentration in water) values for 96 hour exposure. (ppb = parts per billion; ppm = parts per million.

Pesticide (Trade name)	LC_{50} value	Pesticide (Trade name)	LC_{50} value
biphenthrin (Talstar)	0.15 ppb	cyfluthrin (Tempo)	0.68 ppb
fluvalinate (Mavrik)	2.9 ppb	avermectin (Avid)	3.6 ppb
isazophos (Triumph)	6.3 ppb	hexakis (Vendex)	6.6 ppb
fenpropathrin (Tame)	10.3 ppb		
dienochlor (Pentac)	50 ppb	dicofol (Kelthane)	53-86 ppb
diazinon	635 ppb	ethoprop (Mocap)	1.02-1.85 ppm
bendiocarb (Turcam, Dycarb)	1.55 ppm	carbaryl (Sevin, Sevimol)	1.95 ppm
malathion	2.00 ppm	chlorpyrifos (Dursban)	3.0 ppm
acephate (Orthene)	> 1000 ppm		