PLANT PEST Newsletter

MINNESOTA EXTENSION SERVICE UNIVERSITY OF MINNESOTA

PPST19 August 20, 1993

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CORN

BLACK LIGHT TRAP CAPTURES

Data collected by: University of Minnesota, Minnesota Department of Agriculture and Private Cooperators—Traps Reporting 8/18/93

EUROPEAN CORN BORER +

District	Location	Aver.	High	Date/Max
WC	FERGUS FALLS	3.75	6.00	930816
C	GLENCOE	4.83	8.00	930817
C	BIRD ISLAND	7.71	17.00	930812
C	OLIVIA	7.29	13.00	930814
C	GAYLORD	1.83	4.00	930814
C	GROVE CITY	3.86	9.00	930814
SC	BLUE EARTH A	19.33	42.00	930817
SC	BLUE EARTH B	9.83	17.00	930817
SC	LE SUEUR W	33.29	62.00	930816
SC	LE SUEUR E	22.14	34.00	930816
SC	SLEEPY EYE A	25.33	54.00	930813
SC	SLEEPY EYE B	22.17	43.00	930815
SC	WASECA	4.86	9.00	930814
SC	ST. PETER	17.67	36.00	930816
SE	CALEDONIA	1.50	4.00	930816
SE	RANDOLPH	14.14	27.00	930816 *-2
SW	LAMBERTON	16.80	32.00	930816

*-Number of nights...High derived by average over multiple nights. + More than 1 night with maximum value.
Observation dates: 930811 TO 930818

For more information regarding the Plant Pest Newsletter contact Extension Plant Pathology at 612-625-6290

UNIVERSITY OF MINNESOTA, U.S. DEPARTMENT OF AGRICULTURE, AND COUNTIES COOPERATING

WHEAT

FACTS ABOUT DEOXYNIVALENOL (DON)—Survey samples are rolling into our laboratory and testing is now underway. So far 8 samples of the 200-250 have been tested and all of them contained DON at levels of 2-18 ppm. The testing lab will now be able to run about 20 samples per day and results will be reported when completed. Up to date results can be obtain by calling our office.

We have had a lot of questions about the toxicity of DON in animal feed. Below are some general exerpts from the literature that will help answer some questions.

* **FDA suggested levels of concern are 1 ppm for flour, 2 ppm for baked goods and 4 ppm for feed.**
* **Ruminants**
  Chronic studies of naturally occurring concentrations of 10 ppm failed to cause any discernable effects in cattle or sheep.
  Detoxifies in the rumen
  No transfer to milk when fed 66 ppm in the feed
  Associated with loss in rolling average milk production with a high correlation to DON with the number of days open (up to 0.334 ppm).
* **Poultry**
  No impact on the productivity of broiler cockerels up to 116 ppm.
  Oral lesions at 49 ppm or higher
  Leghorn 50 ppm for 4 weeks had no effect on egg production or caused any other problem
  Broiler chicks 16 ppm causes reduced growth rates in one study, it also impaired feed conversion, increased the liver size and caused anemia.
  No effect in studies containing 18 ppm, 38 ppm and 83 ppm.
  No residues in meat at 83 ppm.
  Less than 0.2% transferred to egg but on 10% was DON. No threat in eggs.
  May effect the fertile egg so it should not be used in any breeder flocks, either the grain or straw bedding.
  Leghorn chicks, laying hens and broiler chicks at 4-5 ppm had none appear in the eggs or tissue.
  None in eggs at 18 ppm.
* **Hogs**
  One ppm reduced feed intake.
  One study reported traces of the DON appearing in the major organs at the time of slaughter but the residue disappeared when the contaminated feed was withdrawn about 12 hours before slaughter.
  Decreased feed consumption and reduced wt gain at 2 ppm.
  The amount of DON effecting hogs vary from 2-8 ppm we have had refusal when 1 ppm was found in a feed. There are other compounds which could have an additive or synergistic effect.
* **Effect on grain Quality**
  Lowers test weight.
  Lowers grade, kernels damaged by mold.
  Baking quality effected. Effects rising quality color and elasticity of bread.
  The quality of gluten is reduced, low elasticity, stretch and swelling capacity reduced.
  Produces an off odor flour.
  DON not destroyed by baking or cooking.
* **Effect on Seed quality**
  Reduces germination.
  Degrades starch in seeds.
  Kills embryo by invading the embryo during germination.
  Example: In a sample of grain where 28% was infected with scab, the 1000 seed weight was reduced, it had a higher ash content, less protein, less wet and dry gluten and the gluten quality was reduced.

Seed treatments, seed vigor tests and burying corn and wheat residue is recommended to reduce infections in the growing seasons to come.

The bottom line in feeding is none to hogs and horses (just because we do not have good data on horses), poultry and cattle up to 10 ppm. This builds in a safety factor as there are some studies which indicate some problems. Most studies, however indicate very little problem with sheep, cattle or poultry at up to 10 ppm.

IMPORTANT

The recommendations are based on DON concentrations. Caution should always be used in feeding as other compounds may be produced which are more toxic than DON. We are looking for one other possible toxin (nivalenol) and will report results when they arrive.

Richard A. Meronuck
Extension Plant Pathologist
Roger K. Jones
Extension Plant Pathologist

ANSWERS TO SOME FREQUENTLY ASKED QUESTIONS ABOUT SCAB AND VOMITOXIN

Q: Does vomitoxin increase in storage?

A: No. Vomitoxin is formed in the field as a result of fungal growth in the kernel and in the glumes—under conditions of very high humidities. Once grain is dried below moisture levels of 22-25%, vomitoxin production is stopped. Grain stored at appropriate moisture content for storage won't have further vomitoxin development.

Q: Does grain drying increase the vomitoxin level?

A: No. Drying grain to appropriate moisture levels for storage does not increase vomitoxin levels. However, if a vomitoxin test is taken on wet grain, about 14-15% moisture, the wet grain may actually test **lower** for ppm vomitoxin than if the grain moisture content was at 14-15% moisture or lower, because of a dilution effect of the water still left in the wet grain. Test for vomitoxin at moisture contents of 14-15% or lower.

Q: Does high temperature grain drying decrease vomitoxin levels?

A: Normal grain drying will not decrease vomitoxin levels. The grain can be detoxified only at temperatures of 230°+ Centigrade, a temperature so hot that it causes roasting of the grain.

Q: Is there a way to detoxify the vomitoxin?

A: There are no quick fixes. Food chemistry journal articles indicate that various chemical reagents, such as sodium bisulfite, chorine, aqueous ammonium, and other reagents have been tried for reduction of vomitoxin, with varying degrees of success, but these procedures are not well defined nor have they been developed for farmers or grain elevators. Often they destroyed the milling quality of the grain.

For hay or silage that may be at high moisture levels, common procedures to reduce mold in this material may reduce the scab fungus or stop it from growing in the wet hay. Discuss this possibility with livestock specialists.

Q: Does the vomitoxin pose a risk to grain handlers or farmers at harvest or in storage?

A: Vomitoxin is present in the kernel, and to pose a risk, it would have to be ingested in very high amounts. However, grain fields this year are moldy, moldy, moldy, and not just from scab spores. Mold spores will cause allergic reactions and breathing problems if inhaled. Normal precautions should be taken to protect lungs when working in environments with high levels of grain dust and molds.

VOMITOXIN FINDINGS, PLUS EFFECTS OF USING AIR CLEANING AND GRAVITY TABLE TO REMOVE SCAB AND REDUCE VOMITOXIN

Summary of Vomitoxin Tests done by Dr. Casper, NDSU, through Aug. 17

Wheat: ND - 19 samples representing Pembina, Traill, Cass, Richland and Sargent counties.
MN - 17 samples representing Clay, Wilkin and Becker counties.
Vomitoxin ranges from 0.9 - 18 ppm, over half between 4-10 ppm.

Barley: ND - 46 samples, mostly from same area as wheat; vomitoxin ranges from 0.9 - 24 ppm.
Over half from 4-10 ppm, one-fourth over 10 ppm.
MN - 1 sample, at 11 ppm.

Levels frequently higher than 2 ppm guideline for grain and 4 ppm feed.

CLEANING DOES REDUCE VOMITOXIN LEVELS—Past experience has shown us that scab levels and vomitoxin can be reduced with grain cleaning. Hard evidence is also available. The USDA Northern Regional research lab at Peoria, Illinois does much work with mycotoxins. They cleaned 23 samples of scabby wheat in 1991 with aspiration (air flow) and reduced the vomitoxin levels by half or greater 80% of the samples. Air cleaning will result in a large loss of grain, however, because the levels of air needed to get rid of scabby grain results in loss of non-scabby grain as well.

Results of gravity flow cleaning: A Felton, MN elevator recently sent Dr. Casper samples (four wheat and one barley) that had been cleaned to varying degrees on a gravity table separator. The results show that this type of cleaning is very effective in getting grain to high test weights and low vomitoxin levels. A summary of the data follows:

Degree of Cleaning	Average TWT	Average Vomitoxin
dirty (field sample)	54.2	7.0 ppm
#1 cleaned (best)	59.9	1.5 ppm
#2 " "	58.4	3.1 ppm
#3 " "	55.7	5.0 ppm
screenings	41.2	26.1 ppm
Barley (1 sample)		
dirty		14.8 ppm
#1 clean		5.9 ppm
screenings		26.0 ppm

Gravity flow may not be suitable for the poorer grain because of degree of cleanout needed.

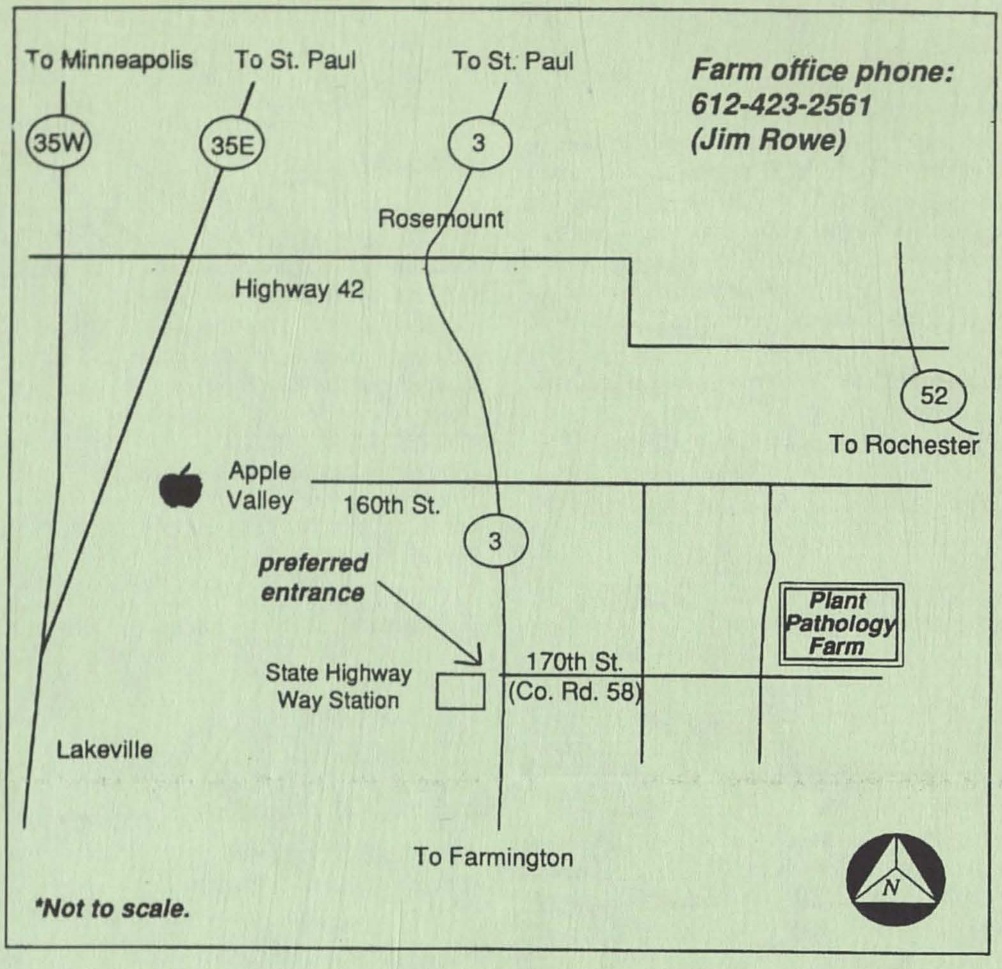
ADDITIONAL INFORMATION ON CLEANING WHEAT TO REMOVE VOMITOXIN—Please be advised that for the four wheat samples cleaned on the gravity table at Felton, MN, the test weights ranged from 50 lb to 57 lb.

To get to the end test weight and the vomitoxin levels below the 2 ppm guideline, much of the original sample was removed: an estimated (but not measured) 15% to 35% went to screenings, and an estimated 17% to 21% was left in the final #1 best sample. Much less grain would be lost, or more could be utilized as marketable grain, if the guidelines for grain would be relaxed to the 3-4 ppm range for the 1993 crop.

At the 2 ppm guideline, farmers will have to do some strong thinking and calculations to determine the economics of clean-out at this level of infection.

Marcia McMullen
NDSU Extension Service

VEGETABLE IPM FIELD DAY—The final schedule (including map) for the 1993 field day is summarized below. Current research on vegetable pathogen and insect pest management will be highlighted, including recent results on alternatives to conventional insecticides. All industry personnel (chemical, *B.t.*, processing), growers and extension educators are welcome.



Vegetable IPM Field Day: August 25th, 1993
Plant Pathology Farm
Rosemount Agricultural Experiment Station

12:00-1 PM Informal, Hands-on ID of Insect/Disease Samples, meet with specialists. (Veggie hors d'oeuvres)

1:00 Sweet corn, pea and snap bean diseases: 1993 Damage, ID & Overview. **Laura Sweets, Pillsbury-Green Giant.**

1:15 Sweet corn and pea seed treatment studies. **Laura Sweets**

1:30 Insect Pest Overview & Monitoring Methods: Blacklight & Pheromone Trap Options. **Bill Hutchison, Department of Entomology, University of Minnesota, Minnesota Extension Service**

1:45 Colorado Potato Beetle Control: Resistance & Insecticide Alternatives—1993. **Dave Noetzel, Department of Entomology, University of Minnesota, Minnesota Extension Service**

2:00 Sweet Corn/Cutworm Demonstration Trial: Cutworm Biology & Management. **Dave Noetzel**

2:20 Impact of Corn Borer Infestation Timing and Sweet Corn Plant Growth Stage (whorl to silk) **Dave Bartels, Department of Entomology, University of Minnesota**

2:40 Corn borer first-generation insecticide trial results and review of 2nd-generation studies. **Bill Hutchison**

3:00 Corn borer/Snap Bean Study: Infestation Timing & Residual Activity of Insecticides. **Bill Hutchison**

3:20 Cabbage insecticide & *B.thuringiensis* (microbial insecticide) results: an emphasis on cabbage looper. **Bill Hutchison**

3:45 Evaluation of New Action Thresholds for Cabbage Pests & Impact of Reduced *B.t.* Rates on Pest Parasitism. **Pat Bolin, Department of Entomology, University of Minnesota**

4:30-5:00 Free Dinner (Sweet corn, etc...)

Bill Hutchison
Extension Entomologist

CLINIC REPORTS

PLANT DISEASE CLINIC

Samples submitted to the clinic recently included:

soybean	-	Downy mildew bacterial leafspot SCN - white females on roots *Rhizoctonia* sp., *Phythophthora* sp. and *Pythium* sp. root rots
radish	-	*Aphanomyces* sp.
alfalfa	-	*Phythophthora* sp. root rot
turf	-	*Rhizoctonia* sp. root rot *Colletotrichum* (anthracnose) *Drechslera* sp. leaf spot
oak	-	oak wilt
elm	-	Dutch elm disease
strawberry	-	*Botrytis* sp. fruit rot
rose	-	*Coniothyrium* sp. canker
geranium	-	*Xanthomonas* sp - bacterial wilt
petunia	-	*Pythium* sp. stem rot
spirea	-	*Cylindrosporium* sp. leaf spot
bleeding heart	-	*Pythium* sp. root rot

DIAL U

COUNTY AGENTS: Please alert master gardeners to the following:

Lots of pruning calls are coming our way this month. While it's a perfectly good time to prune most shade trees, it's really too late to prune shrubs, whether they're deciduous or evergreen. Pruning now will encourage new growth and could interfere with the hardening off process whereby they slow down to make it through the winter.

Flowering perennials have been green long enough that you can probably cut them back (in order to divide them) without jeopardizing next year's growth. Late summer is a good time to plant, divide, or transplant most perennials. Hold off moving garden lilies, though, till the latter part of September or early October.

Any perennial foliage that's turned quite yellow by now can be cut down, but don't cut healthy green foliage back unless you are dividing and transplanting.

People are interested in sodding now. There's no reason not to sod as long as you're able to water regularly so it doesn't dry up in the heat. Seeding should wait until weather cools again, except in northern Minnesota where it's rarely too hot and the window of seeding opportunity is very short. In the Twin Cities area you have until mid-September to seed; perhaps a week later, further south.

Creeping charlie is still our number one weed call, but it's a bit early to attack it. Wait till weather moderates in September. Fall spraying weakens it so winter weather can finish the job (hopefully).

Crabgrass is very apparent in many lawns. If you need to seed, hoe out much of the crabgrass or if the grass is nothing but crabgrass, rent a sod cutter to slice it out. These plants are only annuals; they won't be back to cause any trouble next year. It's their seeds you need to worry about.

Seed grass in early autumn, then use a pre-emergent herbicide in the area next spring to stop the crabgrass seeds from sprouting. Keep the area watered and fertilized to promote good grass growth next year. The thicker the turf, the less problem you'll have with annual weed germination.

Late season insects on trees and shrubs—We have been receiving various questions about caterpillars, sawflies, beetles, aphids, and other insects attacking trees and shrubs. The feeding of these insects is not important, this late in the season. Unless there are special circumstances, such as very heavy infestations on stressed trees or very young trees or shrubs, control is unnecessary.

Picnic beetles—Now is the time to be careful to avoid attracting picnic beetles into gardens. These small (1/4 inch long), black insects with four orange spots are attracted to fermenting smells and will be found on overripe and rotting fruits and vegetables. Once in the garden, picnic beetles can move to developing fruits and vegetables to feed. When found in the garden, these beetles are difficult to discourage. Insecticides can effectively kill picnic beetles. However, then you have to wait before you can safely harvest your produce and by then the picnic beetles have probably returned. Insecticidal soap doesn't have any waiting period and may be effective. The best bet is to pick fruits and vegetables as they ripen to avoid attracting the beetles to begin with.

Iris borers—There have been questions recently about dusting iris bulbs with insecticides to prevent iris borer attacks. This is not likely to work for several reasons. First, the timing is wrong. The iris borer is a mature caterpillar about now. It will pupate and emerge as a moth later in the fall. The residual of insecticidal dusts doesn't work that long. None of the insecticides registered as dusts are very effective against iris borer even if the treatment was timed correctly. Most (if not all) dusts available to the public are not registered for irises, making the suggested usage inconsistent with the intended labelling.

Bat exclusion—Young bats are usually able to fly and forage on their own by mid-August, making September a good time to undertake exclusion efforts. Exclusion is the most effective and permanent means for preventing unwanted bat roosting. First, identify the entry and exit points, sometimes as small as 3/8". Dark smudges on the house siding often indicate such passages. Openings can also be located by watching the bats leave to forage approximately 1/2 hour before dusk.

Secure 1/4" mesh polypropylene bird netting above each opening with staples or duct tape. The lower edge of the netting remains unattached and should hang 2 feet below and extend 1 foot to each side of the opening. Attach a wood spacer 1-4" directly above the opening to lift the netting slightly away from the siding. This allows bat to emerge, but later they will fail to find their way back. The netting acts as a one-way excluder until repairs can be made at a later date. Allow 2-3 nights during warm weather and at least a week before completing repairs during cool periods in the fall. Hardware cloth with 1/4" mesh works well on chimneys and vents. Caulking, flashing, weatherstripping, stainless steel wool and insulation are also suitable patching and sealing materials.

Brown rot is a fungal disease which can infect blossoms, twigs, and/or fruit of most cultivated varieties of stone fruits. Typically, this disease is first noticed on the maturing fruits as light brown spots which tend to expand rapidly under favorable weather conditions. In warm, humid weather ash-grey tufts of fungus mass develop over the rotting fruit. Twigs may develop small cankers when fruit or blossom infection persists, and the fungus continues to grow into the woody tissue. The fungus tends to overwinter in infected branches/twigs or more commonly in dried infected mummified fruits of plum, cherry and apricot. To control: remove all mummified fruit and infected twigs. Next spring, apply fungicides at blossom time and repeat sprays according to the label to help manage this disease.

Other common calls include carpenter ants, insect/mite galls, bumble bees and galls

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