RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

FIELD CROPS/LIVESTOCK EDITION $1.50 JUNE 8, 2000

INSIDE

Corn Fields – A Rainbow of Colors

Daniel Kluchinski, Mercer County Agricultural Agent

Corn grows best under warm, sunny conditions. However, growing conditions this spring have been generally cool and often damp to wet. Specific weather conditions, in addition to some management factors, can cause corn plants to exhibit a range of colors. These colors can be useful diagnostic tips in assessing potential problems, and helping you to know if you have a reason for concern or not.

Many fields have plants with **yellow-green** colored leaves, due to cool after-planting air and soil temperatures. Warm, sunny days will help to bring out a darker green color. If the condition persists, and the yellow starts to deepen at the leaf tips, and move along the middle of the leaf, there may be nitrogen deficiency problems. Consider soil testing to determine current nitrogen concentration in the soil, and apply the recommended sidedress rate when the corn is 12 to 18 inches tall.

Red or purple corn can be due to accumulation of the pigment anthocyanin that can be produced in large or small quantities based on the variety. Red color can also be due to poor root development, cool nights, or low or unavailable phosphorus. Warm, sunny weather should remedy the situation as root growth or phosphorus availability increases. One might consider soil testing to determine if soil P levels are below optimum. If so, there might be a need to consider applying more phosphorus in the starter fertilizer. Root restriction may also be due to grub feeding or soil compaction. If the plants do not grow out of this stunted growth, check for these problems.

If corn plants are **white**, focus on herbicide damage. White symptoms may be due to injury by the herbicide clomazone (COMMAND), isoxaflutole (BALANCE) or spray drift of glyphosate (ROUNDUP). If a single white plant appears in the field, it most likely is a genetic mutant.

Silver or dull-gray leaves, or portion of the leaf that is positioned horizontally, may be due to radiational cooling on clear calm nights were temperatures fall in the mid-to upper 30's. The damage is superficial and will not cause a yield problem.

For assistance or additional information, contact your local county agent. ❑

Wildlife Management Twilight Meeting

Raymond J. Samulis, Burlington County Agricultural Agent

It comes as no surprise to farmers that wildlife damage to New Jersey farms is on the rise. Natural pest populations are increasing and urbanization has greatly reduced normal animal habitats. Deer, geese, swans, ground hogs, and grackles all raise havoc and cause severe economic losses. Rutgers Cooperative Extension of Burlington County has developed a Wildlife Management Twilight Meeting to share the latest techniques and devices to better deal with wildlife problems. The Rutgers Wildlife Damage Specialist, as well as state and local Fish and Game personnel will give demonstrations. This Twilight Program will be held the evening of June 19, 2000, at 7:00 p.m. on a farm just outside Mt. Holly. While this program was designed for Burlington County farmers, growers from other counties with severe wildlife problems or just interested in wildlife damage are welcome to attend. Out of county growers can call our office at (609) 265-5050 for directions.

Growers attending the meeting can anticipate learning the most comprehensive wildlife damage information available, enjoy refreshments, and direct discussions with knowledgeable experts and growers experiencing the same problems as you are. Why not come out and experience the latest in an ongoing struggle? ❑

Not All Buggy-Whipping in Corn is Due to Herbicides

Mark VanGessel, Ph.D., Weed Science, University of Delaware

Buggy-whipping in corn is a common sight early in the growing and season and later under certain environmental conditions. The cause of buggy whipping is the formation of abnormal waxy leaf layers and leaves do not unfurl properly. Agrichemicals and environment can cause this. The chloroacetamides (Dual, Harness, Surpass, Topnotch, Frontier, Partner, etc) can all cause this problem. Even with the safeners added to these products, bugging whipping can occur. The common scenario is that the first rain event after application is a heavy rain storm followed by a few days of cool and overcast weather. Corn that has emerged (up to 2-3 collars), before the rain event can also develop this buggy whipping, but the taller the corn becomes the less likely it is to occur. Banvel, Clarity, Distinct, or 2,4-D in the whorl can cause buggy-whipping.

There is a phenomenon called "accelerated growth syndrome" that Bob Nielson at Purdue University identified as early as 1995, if not earlier. Basically it's unusual twisted growth where the affected plants are tightly twisted, are often severely bent over, and do not unfurl on a timely basis. Young leaves deep in the whorl continue to grow rapidly, but are unable to emerge from the unfurled upper leaves. The growth stage where this seems to occur is around 5 to 6 visible leaf collars. After the whorls unroll, you may see "yellow tops" across the field. The younger leaves that had been trapped inside the twisted upper leaves are yellow because they had been shaded for quite some time. After a day or two the plants will green up and the problem will not be visible. Yield effects will be minimal, if any. This problem often occurs following a sudden return to optimum growing conditions preceded by a period of poor growing conditions. I have seen this occurring in some of my plots this year. ❑

Manganese Applications with Postemergence Roundup

Mark VanGessel, Ph.D., Weed Science, University of Delaware

Roundup Ready soybeans may require a postemergence application of Roundup and a manganese application about the same time. Roundup Ultra can be tankmixed with manganese with some precautions. The manganese products can bind with Roundup in the spray tank and reduce Roundup's effectiveness. The form of manganese has an impact. Manganese chelated with EDTA did not affect the performance of Roundup, but other forms of manganese did. The addition of ammonium sulfate overcame the problem. Thus, when tankmixing Roundup with manganese, use an EDTA form of manganese or add ammonium sulfate to overcome the reduced weed control. When using ammonium sulfate be sure to add the ammonium sulfate to the tank first and add the Roundup last. ❑

Avoiding Common Pesticide Usage Problems

Phillip Tocco, Salem County Program Associate in Field Crops ICM

Pesticides are a very important tool in modern agriculture. When used properly, they can save a crop from being destroyed. They can have the opposite effect if they aren't used properly. Common errors are the single biggest reason pesticides don't work as advertised. With this in mind, let's review some basic ideas about pesticide usage that may add to their value to you when pesticides are needed.

Read and follow the label instructions.

The newest pesticides can be tricky to use. Whether or not they work at all can depend on how well the directions are followed. The first way you can keep a lot of problems from happening is by following the directions on the label.

The other reason you should follow the label directions is legal. A pesticide label is a legal document. If you don't follow the recommendations written on the label, you are breaking the law. If you are caught using the pesticides in a way other than what is printed on the label, you could be fined, or worse.

In 1995, a pesticide applicator in Minnesota was caught illegally applying chlorpyriphos (Dursban) to oats. He was convicted of misuse of pesticides and food adulteration and received a sentence that included 5 years in jail *and* 200 hours of community service. Dursban was not labeled for use on oats. This is why reading and following the label is important.

Know your target.

More than half of all pest management treatments fail because of a misdiagnosis of the problem. If your plants are dying, make sure the ugly green critter you see everywhere is responsible for it before spraying to kill the critter. If you have a CCA or crop scout, make sure that he or she gets *into* the field to see what's going on. There's nothing worse than basing pest management decisions on a dashboard diagnosis. If you aren't sure of what's eating your field, ask your local field crops extension agent. That's what they're there for.

Don't overlap your spray pattern unless you planned to when you calibrated your rig.

This is a case where if some pesticide is good, more pesticide may not necessarily be better. Some herbicides are only selective at certain application rates. By overlapping the spray pattern, you may be doubling the application rate and killing your crop.

Make sure your spray rig is in working order.

Make sure the rig is calibrated. Correct pressure and nozzles are necessary for an accurate application. If the nozzles are worn or clogged, the application may be uneven. If the pesticide requires tank agitation, is your method of agitation working (i.e. enough extra pressure bypassed to the tank)? Many of the new pesticides require so little product to be effective that any one of these problems can really make an application ineffective.

Wash and rinse the spray tank with a tank cleaner and fresh water.

Residues from previous spray applications can burn or kill plants. This makes it really important to minimize carryover from one application to the next. By using a tank cleaner, you guarantee yourself a clean tank for the next application.

Planting crops is a big investment. It makes sense that if I put the time and money into tilling the ground and planting seed, I would want to do my best to keep after the crop. Many common problems can be avoided by just paying attention to details. The nice thing is that once we've done our part to make the crop a success, we can sit back and enjoy the paybacks come harvest time. ❑

Farmers Needed for Wildlife Damage Study

David Drake, Ph.D., Wildlife Management

Rutgers Cooperative Extension is currently conducting a study to assess damage to a variety of agricultural crops. We have put up roughly 70 exclosures so far and expect to put up another 30 - 50. However, we need to locate farmers who are experiencing wildlife damage (ranging from some to a lot) to their crops. We are looking for farmers who are currently growing strawberries, apples, leafy vegetables, and nursery stock. We will be looking for other fruit and vegetable crops, forage crops, and grains as they are nearing harvest. The USDA assessment techniques can only be used when the crop is mature and nearing harvest or actually being harvested. You cannot be using fencing or any other type of crop protection, as this will bias our results. We will not interfere with any farming practices. We need to assess damage from all types of wildlife (i.e. groundhogs) and not just deer and geese. Please contact your county agricultural agent about participating in the study. ❑

Wet Soils

J. C. F. Tedrow, Ph.D., Professor Emeritus, Environmental and Natural Resources, Cook College

One of the most important factors limiting crop production in New Jersey is lack of proper water-air balance in the soil. While many soils drain too rapidly and have poor moisture retention, many other cases exist where the soils have some degree of impeded drainage.

Oxygen is needed in the soil in large quantities, this source being primarily from the atmosphere. One of the important functions of oxygen is to permit the development of a larger root system that can pick up more plant nutrients from the soil. If the soil is water-logged, little or no oxygen will get into the soil, and plants will not make normal growth.

The soil profile reveals the air-water relationships in the soil. When soils are water-logged or semi water-logged, they show signs of **mottling**. Mottling means there is too much water in the soil and gaseous exchange is not rapid enough.

Following are some facts to remember:

- ✔ The best soils for general crops show no signs of mottling.
- ✔ If the mottling is deep, it will not cause as much trouble for plants as if it is shallow.
- ✔ Strong mottling and gray colors are signs of wet soil conditions.
- ✔ Crops that should be grown only where no mottling is found are: alfalfa, corn, potatoes, orchards, and most vegetables. Crops that will tolerate an intermediate amount of mottling are: small grains (except wheat), and alsike clover. Crops that will tolerate a high degree of mottling are: red top, Reed canary grass, and timothy. Some special crops, particularly cranberries and blueberries, however, not only tolerate wet soils, but thrive on them.

Submitted by Joseph Heckman, Ph.D., Soil Fertility. ❑

What Does the Atmosphere Feed Your Crops?

Reprinted from Agri-Briefs Agronomic News Items, Summer 2000, No. 1, Potash & Phosphate Institute.

Our atmosphere is changing. Industrialized society has produced rising levels of carbon dioxide, ozone, and nitrogen oxides. Sulfur dioxide emissions may have stabilized, but considerable amounts are still transferred in the air, particularly in the northeast states.

What do these substances do to your crops? Do they help, or do they harm?

Carbon dioxide, worrisome for its role as a greenhouse gas, is the biggest source of nutrients for all plants. More than 90 percent of plant dry matter is made up of the carbon and oxygen it supplies. Numerous studies indicate that the elevated levels expected in the future are likely to stimulate plant productivity.

Ground level ozone, on the other hand, can hurt your crop. Near urban areas, crops frequently show symptoms of ozone injury. Increasing levels of carbon dioxide may not do much more than counterbalance the increasing levels of ozone.

Across the eastern Corn Belt, sulfur dioxide in the air can supply substantial amounts of the plant nutrient sulfur. Plant leaves can absorb it through their stomates as a gas or through their roots after rain washes it into the soil as sulfate. The soil does not hold sulfur well, though, and crops like alfalfa, which remove a lot of it, can still show deficiencies.

In some areas, sulfur dioxide may be concentrated enough to cause stress to plants. Recent research in India showed that nutrient-deficient soybeans were particularly susceptible, while those grown with balanced levels of nitrogen, phosphorous and potassium tolerated stress better. Potassium protects against ozone as well by increasing leaf levels of antioxidants such as ascorbic acid.

Nitrogen can be delivered through the air just like sulfur. Across most of the Corn Belt, 5 to 8 pounds per acre fall with the rain each year. Ammonia that volatizes from livestock operations, manure storages, and fields can be absorbed as a gas by plant leaves. Leaves also rapidly take up oxides of nitrogen that are emitted from the soil. In fact, a recent study in Ontario found that turf fertilized with nitrogen took up nitrogen oxides faster than unfertilized turf.

In some areas near the ocean coasts, the rain delivers as much as 28 pounds of chloride per acre each year. Away from those areas, however, chloride deposition is negligible. Rainfall delivers only very small amounts of calcium, magnesium, potassium, and phosphorus – not enough to be significant to the nutrition of most crops.

Deposition varies greatly from one place to another and from year to year. The National Atmospheric Deposition Program, through its nationwide network of precipitation monitoring sites, provides useful maps showing the distribution of nutrients delivered by rain each year. Their website, http://nadp.sws.uiuc.edu/, gives full public access to the data.

Your nutrient management plan is not complete if it doesn't consider what comes from the air.

Submitted by Joseph Heckman, Ph.D., Soil Fertility. ❑

Crop Field Day

Corn and Soybeans
Thursday, June 15th

9:30 a.m. to 11:30 a.m., Sam Santini Farm, (Cline Farm) Stewartsville, NJ
2:00 p.m. to 4:00 p.m., Neil Murphy Farm, Kresgeville, PA

Sponsored by Cooperative Extension of Rutgers and Penn State Universities

- Learn to evaluate corn and soybean stands.
- Practice identifying weeds, insects and diseases.
- Learn how to improve management practices to increase corn and soybean yields.
- Learn how to "fine tune" the timing of Round-Up applications.
- Learn how to improve post-emergent weed control.
- Learn to identify insect damage and determine thresholds for rescue treatments.

Special Feature: Diagnostic Clinic

Bring your problem weeds, insects and disease samples with you and receive personal assistance in problem identification and management.

Agricultural specialists and agents from Rutgers and Penn State Universities will present information and hands-on evaluations of corn and soybean fields to improve yields, control weeds, analyze soil fertility, and increase profitability.

To register, please call *by June 13th*: Everett A. Chamberlain, Rutgers Cooperative Extension of Warren County at 908-475-6503 or Robert C. Mickel, Rutgers Cooperative Extension of Hunterdon County at 908-788-1339.

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged below normal. Extremes were 96 at Pemberton on the 2nd and 39 degrees at Charlotteburg on the 30th. Weekly rainfall averaged 0.14 inches north, 0.12 inches central, and 0.02 inches south. The heaviest 24 hour total was 0.35 inches at Toms River on the 2nd to the 3rd. Estimated soil moisture, in percent of field capacity, this past week averaged 80 percent north, 71 percent central and 66 percent south. Four inch soil temperatures averaged 61 degrees north, 63 degrees central and 62 degrees south.

Weather Summary for the Week Ending 8 am Monday 6/5/00

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.23	13.87	1.84	89	46	64.	-1	498	81	72
CANOE BROOK	.15	9.78	-3.43	92	48	64.	-1	570	190	76
CHARLOTTEBURG	.15	12.09	-1.00	88	39	60.	-2	355	85	69
FLEMINGTON	.04	12.04	-.48	90	47	65.	-1	595	196	79
LONG VALLEY	.15	12.16	-1.32	86	46	61.	-2	423	111	74
FREEHOLD	.07	9.20	-3.26	90	50	65.	-2	629	161	71
LONG BRANCH	.00	10.97	-1.81	91	50	63.	-3	477	61	53
NEW BRUNSWICK	.09	11.67	-.58	91	48	65.	-3	603	101	78
PEMBERTON	.02	10.98	-.90	96	52	70.	3	922	426	44
TOMS RIVER	.37	10.21	-2.20	93	49	63.	-1	580	150	68
TRENTON	.16	11.11	-.17	90	50	65.	-3	656	107	58
CAPE MAY COURT HOUSE	.01	12.45	1.52	90	48	63.	-3	596	107	63
DOWNSTOWN	.08	11.45	.25	91	48	65.	-3	671	108	52
GLASSBORO	.00	12.23	.26	92	43	66.	-2	735	192	53
HAMMONTON	.01	9.89	-1.76	91	47	64.	-4	630	95	57
POMONA	.01	9.46	-1.31	90	47	63.	-3	582	118	57
SEABROOK	.00	12.84	2.45	92	51	66.	-2	730	162	50
ATLANTIC CITY MARINA	.00	10.21	-.01	83	53	63.	-2	599	160	49
WOODSTOWN	.07	14.13	2.31	94	46	67	NA	754	NA	NA

WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week 154 (Ending 5/29/00) This Week 175 (Ending 6/5/00)

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PLANT & PEST ADVISORY

FIELD CROPS/LIVESTOCK EDITION

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