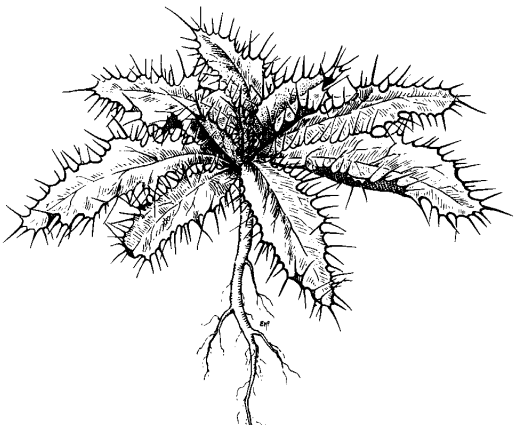
RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

FIELD CROPS/LIVESTOCK EDITION $1.50 JUNE 22, 2000



INSIDE

Weed Notes

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

Weed Science Field Days

The University of Delaware will hold its Annual Weed Science Field Day on Wednesday June 28, starting at 8:15 am. We will meet in the Grove at the University of Delaware Research and Education Center on Rte. 9, Georgetown, DE. For further information, call the Research Center at 302 856-7303. Pesticide credits will be awarded. $5.00 lunch is optional.

What is in Those Soybean Herbicide Pre-mixes?

The following is a summary of the products in commonly used pre-mixes for postemergence soybean herbicides. This is meant as a reference point to compare the amount of various products based on the use rate that is appropriate for you.

Premixes	Component Products
Conclude B&G (co-pack) B at 1.5 pt G at 1.5 pt	1 pt Basagran 4L plus 1 pt Blazer 2L 1.5 pt Poast Plus 1.5E
Extreme 2.17 WS at 3 pt	1.44 oz Pursuit 70 DG plus 1.5 pt Roundup original
Stellar 3.1E at 5 fl oz	6 fl oz Cobra 2E plus 4 fl oz Resource 0.86E
Storm 4S at 1.5 pt	1 pt Basagran 4S plus 1 pt Blazer 2S
Synchrony STS 42DF at 0.5 oz	0.64 oz Classic 25DF plus 0.20 oz Pinnacle 25DF
Typhoon 1.41E at 1.6 qt	0.75 pt Fusilade DX 2E plus 1.5 pt Reflex 2S

Postemergence Options in Soybeans

Spraying Roundup Ultra over the top of Roundup Ready soybeans provides a wider window of application for effective control than with most conventional soybean herbicides. Evaluate conventional soybeans for postemergence sprays 14 to 21 days after planting. The smaller the weeds are, the more options you have to control them, and control will be better. Roundup Ready soybeans should be treated three to four weeks after planting for conventional tilled fields, and three to five for no-till fields. But conventional soybeans should be treated earlier than Roundup Ready soybeans. Most conventional soybean herbicides have residual control that

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allows you to use them early and not need a second application. The reason for spraying conventional soybeans early is due to achieving effective control. The narrower window for spraying conventionally tilled, Roundup Ready soybean fields compared to no-till fields is due to moisture conservation; which should not be an issue this year.

Herbicide Injury is Often Relative

Soybean injury from postemergence spraying is not uncommon. Environment at time of application is a factor. Cloudy weather for a few days prior to spraying and hot, humid weather at time of application are conditions to increase the likelihood of herbicide injury. Herbicide injury can be minimized by using non-ionic surfactant rather than crop oil where possible; as well as not using liquid nitrogen or ammonium sulfate. Below is a relative ranking of soybean injury severity for various postemergence herbicides.

Ranking	Herbicide
Most injurious	Cobra Stellar
Moderate safety	Basagran Blazer Flexstar Pinnacle (non-STS soybeans) Raptor Resource
Fair safety	Classic Pursuit 2,4-DB
Good safety	Reflex FirstRate
Least injurious	Assure II Fusion Poast/Poast Plus Select Roundup Ultra (Roundy-Ready soybeans) Touchdown + Basagran (Roundy-Ready soybeans) Classic (STS soybeans) Pinnacle (STS soybeans) Synchrony STS (STS soybeans)

Touchdown Injury on Roundup Ready Soybeans

Roundup Ready soybeans have shown injury to Touchdown. The injury is brown, dead spots on the leaves, similar to Blazer injury. Only the young leaves at time of application are affected. New growth shows no symptoms. The plots were treated under hot, humid conditions without a surfactant. Less than 10% leaf injury was observed. Including 1 to 2 ounces of Basgran with the spray solution somehow greatly reduces Touchdown injury. However, this low rate will not enhance weed control. ❑

Organic Soybean Production

Jeremy W. Singer, Ph.D., Field and Forage Crops

Organic production is on the rise worldwide. In 1986 there were 29,000 acres of organic cropland in Europe, and 2.6 million in 1996. In the U.S. in 1992 there were 432,000 acres of certified organic cropland and 850,000 acres in 1997. Demand for organic products has been increasing by 20 to 30% for the past several years in the U.S. Organic soybean production has been growing the fastest among grain crops because of research into the medical benefits of soy products and the price advantage over conventional soybeans. The three-year average U.S. price per bushel for organic soybeans from 1995-1997 was $14.58 compared to $7.12 for conventional soybeans.

Many farmers are reluctant to rely on mechanical weed control instead of chemical weed control and never attempt to grow organic soybeans. Those producers who have produced organic soybeans successfully advise that there is a transition period during which they have to master new management techniques to learn the "art and science" of mechanical weed control.

In order to cultivate organic soybeans, they are usually sown in wide rows, typically 30" apart. Therefore, most organic producers use a corn planter to plant their soybeans instead of a grain drill that drills soybeans in narrow rows, usually between six inches and 16 inches. Once the soybeans are planted, a rotary hoe is usually used to eliminate weed seedlings in the white-root stage, before the soybeans emerge. It is not uncommon to rotary hoe soybeans two to three times to minimize weed competition. This implement helps control weeds in the row. Rotary hoeing should not be used when soybeans are in the brittle "crook" stage to three days after. As soybeans grow and rotary hoeing is no longer feasible because of the potential to damage the soybean plant, a switch to cultivation occurs.

Cultivation will only control weeds between rows, so an effective job using the rotary hoe is critical. Cultivators are manufactured for low and high residue conditions. More recently, flamers are being used in addition to cultivation to control weeds within the row. Flamers are used to control weeds that escape rotary hoeing or cultivation. Flames from LP-gas burners kill plants by rupturing cell walls and are most effective on broadleaf weeds as small seedlings.

A wide variety of mechanical weed control measures are used in organic soybean production. Familiarity with each of these tools will allow organic soybean producers to control weeds. ❑

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. ❑

Hay Quality

Jeremy W. Singer, Ph.D., Field and Forage Crops

Every situation has an up side. Last year during the drought at least it was easy to produce high quality hay. So far this year the window for cutting hay and curing it under favorable weather conditions has been more challenging. Nevertheless, high quality hay will be produced in New Jersey this season.

Visual determination of hay quality can be misleading. There is only a weak relationship between hay color and quality. The best method to determine hay quality is to send a representative sample out to a lab for forage quality determination. The test will cost around $20, but the benefit will most likely pay for the test. You can provide a forage quality analysis to potential hay buyers that will verify you are selling a premium product that commands a premium price. If you are feeding the hay then you will have more information to help balance the ration.

To collect a sample to send out to a lab for analysis, collect 20 18-inch hay cores per lot (the same field or the same cutting) using a hay corer. Sample the center of the long end of the bale, not the cut side. Make sure the bales you choose to sample are randomly selected so the results are not biased. Seal the 20 core samples in a plastic bag and send the entire quantity to the lab. Phosphorus and calcium concentrations are important for horses so you may want to consider measuring these elements. The standard analysis usually provides dry matter content, crude protein, acid detergent fiber, and neutral detergent fiber.

For information on labs in our area to send samples to, refer to Extension fact sheet 935, Feed and Forage Testing Labs. There is a market for premium hay in New Jersey. Documentation that the product is premium quality should only strengthen your reputation among hay buyers as a hay producer that produces a high value product. My next article will focus on interpreting results from hay quality analyses. ❑

Stored Grain Pest Control Key to Keeping the Harvest

Daniel Kluchinski, Mercer County Agricultural Agent

Harvest time is fast approaching as wheat, barley, and oats come to maturity. To optimize returns, it is obviously important to keep as much stored grain as you can in top quality for later sale. There are numerous stored grain insect pests that can cause large losses in stored grain. These insects feed on the grain, reducing kernel weight and grain quality that can lead to financial losses at the elevator or reduced nutritional value of livestock rations. It is therefore important to prepare storage bins and develop a plan for preventing or reducing grain losses.

The most common source of insect infestation is old grain. Both internal and external sites can have grain residues and harbor these pests, allowing quick introduction once the grain is augered into the bin. External sites include spillage areas, grain residue in augers and other equipment, and stored animal feed. Internal sites include grain residues in the bin or subfloor areas, and grain attached to walls or in duct-work. To reduce and eliminate such sites for these pests:

✔ Clean around the outside of the bins. Remove any brush, weeds, or spilled grain from around the bins. This can be a haven for insects as well as mice and rats.

✔ Clean equipment and augers before the start of harvest season. Removing this grain and any insects will help to avoid introduction of insects into the new grain. Dispose of this grain away from the bins.

✔ Clean the walls and floor of the empty bin with a broom or vacuum. If possible, clean as much duct and subfloor areas if possible.

Once the bins have been cleaned and potential sites for insects removed, pesticide applications may be recommended to protect the new grain. These treatments include applications to the empty bin, to the grain as being augered into the bin, or as a top dressing application.

✔ If necessary, use a fumigant to kill any insects in the subfloor area. This treatment should be done every 4 to 5 years. For recommendations and procedure on fumigant use, as well as bin preparation and safety procedures, contact your county agricultural agent.

See Grain Pest Control on page 5

Table I: Pesticides Labeled for Empty-Bin Stored Grain Insect Control for Barley, Oats, Wheat

Pesticide	Dilution Rate	Application Rate and Method
Chlorpryrifos-methyl (Reldan 4E)	0.5 pint in 3 gallons of water	Apply 1 gallon per 1000 sq. ft. of structure surface.
Diatomaceous earth (Insecto)	Rate depends on formulation	Apply 0.4 to 1 lb. per 1000 sq. ft. of surface.
Cyfluthrin (Tempo 2) (Temp 20 WP)	 8 ml/gal/1000 sq. ft. 9.5 g/1000 sq. ft.	Treat storage facilities before filling with grain. 2.96 ml = 1 ounce 1 scoop = 9.5 gram

Table II: Pesticides Labeled for Use in Stored Grain Insect Control in Barley, Oats and Wheat

Pesticide	Dilution Rate	Application Rate and Method[1]
Malathion 57 EC (premium grade)	1 pint in 2 to 5 gallons of water	5 gallons per 1000 bushels as grain fed in auger.
Malathion 1, 2, or 6% dust	apply undiluted	Apply labeled rate as grain fed in auger OR mix into grain surface in truck prior to augering.
Chlorpyrifos-methyl (Reldan 4E)	Apply as grain fed in auger. Rates depend on grain to be treated. Check label.	
(Pytherins)	Dilute one part of spray with 29 gallons of water	Apply 4-5 gallons of solution per 1000 bu of grain as fed in auger. Only provides short residual control.
Reldan 3% dust	apply undiluted	Apply 10 lb. per 1000 bushels as grain fed in auger OR mix into grain surface in truck prior to augering. Can also apply as top dressing in bin at 7 lb. per 1000 sq. ft. of surface area to prevent Indian meal moth.
Diatomaceous earth (Insecto)	Apply undiluted	1 to 2 lb. per 1000 bu. Treat the first loads on the bottom of the bin, and the last loads in the top of the bin.
Bacillus thuringiensis	1 LB. in 10 gallons of water OR wettable powder formulation dry to grain surface	Apply as a top dress in the bin at 10 gallons per 500 sq. ft. of surface area. Mix into top 4 inches of grain. Controls introduction of Indian meal moth.

[1]Insecticide can be applied by small compressed air sprayer, gravity feed drip-on applicator or auger mounted dust distributors

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✔ The inside and outside of the bin can be sprayed with a pesticide and should be done 2 to 5 weeks before the grain goes into the structure. The outside of the bin walls should be sprayed up to 15 feet above the base, and the soil around the bin. Target cracks and crevices as well as the walls, floor and ceiling. See Table I on previous page for pesticides.

✔ Auger the grain into an empty bin or on top of grain recently harvested. *Never* put newly harvested grain on top of last years' grain. If the grain is to be stored for six months or longer, consider using a pesticide on the grain stream while being augered. General information is listed in Table II. Ask your Extension agent for specific recommendations, as rates and materials vary with application method and crops. Always check the label and follow all instructions and precautions.

Once the grain has been place in the bin, monitor and inspect the bins periodically. A good inspection program should include inspection 4 to 6 weeks after the grain is stored and then every 30 days. Look for any signs of infestation such as crusting or webbing on the upper surface, musty odors or wet, warm grain. All are indications that insect activity may be present. Probing the grain is particularly useful in determining infestations, grain damage or moisture in the grain mass. If present, further sampling may be helpful in determining the problem and course of action.

For grain in long term storage, the key is aeration. During the fall, winter and spring, the best way to slow insect activity is to cool the grain mass. The optimum development for insect development is 70°F. If the grain temperature is below 55 to 60°F, insects quit feeding and egg laying, and if maintained at even lower temperatures, will eventually starve out.

These procedures should help to reduce potential losses due to insect pest infestation. If insects are found, bring a sample to your county agricultural agent for identification and information on best control practices. ❑

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged above normal south and below normal north. Extremes were 93 at Pemberton and Hammonton on the 13th and 18th and 45 degrees at Charlotteburg on the 14th. Weekly rainfall averaged 1.02 inches north, 1.40 inches central, and 1.32 inches south. The heaviest 24 hour total was 1.41 inches at Atlantic City Marina on the 18th to the 19th. Estimated soil moisture, in percent of field capacity, this past week averaged 95 percent north, 82 percent central and 58 percent south. Four inch soil temperatures averaged 67 degrees north, 71 degrees central and 72 degrees south.

Weather Summary for the Week Ending 8 am Monday 6/19/00

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	1.44	17.98	4.15	87	53	65.	-3	727	71	91
CANOE BROOK	.69	13.09	-1.89	90	53	67.	-2	822	200	88
CHARLOTTEBURG	.96	16.43	1.39	87	45	62.	-4	543	70	92
FLEMINGTON	1.02	14.97	.70	89	53	66.	-3	852	205	91
LONG VALLEY	.99	15.73	.42	84	52	64.	-3	628	102	92
FREEHOLD	.72	10.99	-3.09	90	54	68.	-2	900	169	75
LONG BRANCH	1.54	14.19	-.05	91	54	67.	-2	742	75	89
NEW BRUNSWICK	1.31	14.55	.78	90	54	68.	-3	868	93	94
PEMBERTON	1.57	13.19	-.36	93	57	74.	4	1268	506	82
TOMS RIVER	2.55	14.03	.03	92	57	70.	1	860	197	100
TRENTON	.72	12.32	-.46	89	55	69.	-3	933	110	61
CAPE MAY COURT HOUSE	.96	13.95	1.55	90	58	72.	2	894	157	61
DOWNSTOWN	1.17	13.01	.35	91	57	73.	1	973	129	72
GLASSBORO	.93	13.64	-.01	91	58	73.	2	1050	227	67
HAMMONTON	1.68	11.92	-1.37	93	56	73.	1	927	112	80
POMONA	1.69	11.51	-.65	92	57	73.	3	884	141	93
SEABROOK	.91	14.31	2.30	91	57	73.	1	1048	198	61
ATLANTIC CITY MARINA	1.90	12.94	1.38	88	59	71.	2	883	199	100
WOODSTOWN	data will no longer be available due to unexpected passing of Ed Flitcraft the observer.									

WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week 209 (Ending 6/12/00) This Week 233 (Ending 6/19/00)

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PLANT & PEST ADVISORY

FIELD CROPS/LIVESTOCK EDITION

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