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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 94-22
Oct. 14, 1994

Wheat crop off to a healthy beginning

Surveys across much of Nebraska have shown the wheat crop to be relatively free of diseases. There is some exception to this in the Panhandle where loose seedbeds and dry conditions may lead to crown and root rot. The survey showed some infection on the coleoptile which could cause some stand loss. Many of the Panhandle fields were planted 3 to 4 inches deep because of dry conditions in early September. Good growing conditions and adequate moisture will reduce the threat of crown and root rot. Other diseases monitored in the fall surveys are leaf rust and wheat streak mosaic. As of early October, neither disease was found in newly emerged wheat, but was present in volunteer wheat. Some wheat streak mosaic is being reported in Kansas, but in Nebraska our wheat is still too small to show evidence of infection. Leaf rust, which occasionally may become moderately severe in the fall, so far hasn't been detected in the surveys.

From our perspective it appears that the 1995 wheat crop is getting off to a healthy start and is in better condition than it has been in the last couple of years.

John Watkins
Extension Plant Pathologist
University of Nebraska-Lincoln
Eric Kerr, Extension Plant Pathologist,
Panhandle Research and Extension Center, Scottsbluff

Fall soil sampling: determining need and method

This year's early harvest will allow many farmers to complete soil sampling this fall instead of next spring. The first question to consider is whether soil should be sampled every year.

For the immobile nutrients and pH it is not necessary to soil sample annually because these soil test levels do not change dramatically from year to year. Many farmers, however, depending upon their personal plans, consulting service or fertilizer dealer do sample annually because they like the yearly record. If one set of samples is bad during one year they know the data is probably an outlier from the long term trend. Soil testing originally was designed to determine the soil fertility level, develop a recommendation, follow that recommendation for three to five years, then sample again.

The one nutrient that probably needs to be determined yearly is residual nitrate-N. This is especially true for continuous corn, grain sorghum, or wheat. Several qualitative factors should be considered when deciding whether to sample for residual nitrate.

The best advice is when in doubt, "Don't guess, soil test."

Procedures for proper soil sampling are outlined in the University of Nebraska-Lincoln Extension publication, NebGuide G91-1000, *Guidelines for Soil Sampling*. Fall soil sampling for nitrate-

N is not recommended for sandy soils. Another consideration is the influence of early sampling on nitrate levels because of late fall or early spring mineralization. Early sampling will underestimate nitrate-N compared to later sampling in the absence of leaching. The amount, however, may not be more than 10 to 20 lbs N/A in a 4-foot depth.

Variable Rate Fertilization

Should farmers consider some type of grid sampling for variable rate fertilizer application? The first question to answer is whether your dealer or you have the capability to variably apply the fertilizer based on manual or computer driven equipment. Having soil samples from some type of grid sampling scheme is the first step, however. For phosphorus, potassium and

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Fall soil sampling *(Continued from page 149)*

zinc, pH and organic matter surface samples from the tillage depth are sufficient. For nitrate-N, however, samples should be taken from the active rootzone (depending on the intended crop) or to a 3- or 4-foot depth. Grid sampling every 2.5 acres (330 foot sample spacing) will generate 30-35 samples in an 80 acre field compared to four composite samples based on current recommended procedures. At \$20 per sample that makes quite a difference in soil sampling costs.

To produce accurate soil nutrient maps, standard grid spacings range from 200 to 330 feet

Biocontrol Conference Nov. 1-3

Biological Control of Insects, a conference on beneficial natural enemies and their use in pest management, will be held at the Nebraska Center for Continuing Education, Lincoln, on Nov. 1-3. This conference will cover the basic principles of biological control of insects, as well as specifics on its use in different settings.

Speakers will include University and USDA scientists conducting biological control research in the Midwest. There will be sessions covering biological control of insects on corn, grain sorghum, alfalfa, livestock, turf, ornamentals and horticultural crops. A laboratory session will provide an opportunity to see live and preserved specimens of many beneficial enemies.

Registration materials and program information are available from Nancy Fields, conference coordinator, 402-472-2844.

Bob Wright, Extension Entomologist, South Central Research and Extension Center, Clay Center

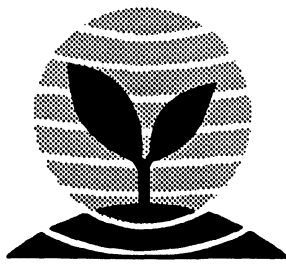
between sampling points. Recent research has shown that a single 2-inch core taken from the center of an area provides as accurate a map as a sample composited from five to eight cores from the same area.

How do grid sampling results compare to field averages for a nutrient like phosphorus? Frequency distributions of soil test phosphorus values from grid sampling typically show a log normal distribution, that is, there is not a nice symmetric distribution of soil test values on either side of the field mean. In a log normal distribution the mean is considerably higher than the median, or central tendency of the data. So what does this mean in practical terms? A high average from a log normal distribution can lead to under

application of a nutrient, especially in low fertility areas. In fact, data has shown that on highly variable fields, more phosphorus is applied by variable rate than by using the field average soil test phosphorus level. With grid sampling, however, the PROPER RATE is applied at the RIGHT PLACE.

Similar findings have not been shown by research on variable rate application of nitrogen the last two years. The variable rate of nitrogen applied to a field is only slightly less than the average nitrogen rate applied to the field based on field average yield, organic matter and nitrate content. The primary difference is where the proper rate of nitrogen is going. A single

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Lisa Brown Jasa, Editor

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Fall soil sampling (Continued from page 150)

Factors to Consider	Presence of Residual NO ₃ -N		
	Very Probable	Possible	Not Likely
1. Were the very lowest corn leaves dark green after the silks were dry?	X		
2. Have you used less than 1.1 pounds N/bu of corn each year for the last five years?		X	X
3. Have you used more than 1.3 pounds N/bu of corn each year for the last five years?	X		
4. Corn in some areas of the field is lighter green showing possible nitrogen deficiency.		X	X
5. Your nitrogen applicator ran out and you could not see where the miss occurred.	X		
6. You have a corn-soybean or sorghum-soybean crop sequence.		X	X
7. Yields of corn were reduced 20% to 40% due to green snap.	X		
8. You have applied manure in one of the past two years and have not reduced your fertilizer nitrogen rate.	X		

average nitrogen rate applied to the whole field will under-apply in some areas and over-apply in some areas. The variable nitrogen rate applies the right nitrogen rate at the right location in the field. In most instances the yields may not be that much different between fixed and variable rate nitrogen. However, the factor that will be different is the residual nitrate-nitrogen level.

The field fertilized with the fixed nitrogen rate creates 'hot' spots or high nitrate areas that have higher potential to leach nitrogen whereas with variable rate application there is a possibility of having a uniformly low residual nitrate over the whole field at the end of the cropping season. We haven't had enough years of

experience with variable rate nitrogen application yet to know whether we can consistently produce the low residual nitrate levels but that is one goal of the current research. The economic and the environmental evaluation of variable nitrogen rate technology is just beginning. We need to have accurate assessments of the impacts on input costs, yield effects, crop nitrogen uptake, and soil residual nitrate after harvest to determine if both economic or environmental benefits occur with variable nitrogen application and under what conditions it is most likely to occur. Variable rate is a promising technology that will have some very specific uses but may not necessarily be required for all production situations.

Soil sampling instructions 20 years ago suggested sampling different areas of the field to have an idea of the large scale variability that existed. Farmers could still average soil test levels and put on an average rate but they knew the degree of variability that was out there. This aspect has not changed today even with the advent of variable rate fertilizer application technology. Even if we know the variability, we must know how to use it to our economic or environmental advantage.

Gary Hergert
Extension Soils Specialist
West Central Research and
Extension Center, North Platte

Sooty stripe common in sorghum fields

During the last few weeks, a fungus disease of grain sorghum leaves has developed very rapidly wherever the crop is grown in Nebraska. The disease is not new to the state, although it commonly escapes detection because of its usual low incidence. This year it was more prevalent than in past years and is easily seen on mid and upper leaves as the crop matures. Fortunately, the disease developed late in the season and, hence, should not limit yield.

Leaf lesions gradually enlarge from small, circular, brown spots

with a yellow halo to elongated or spindle-shaped lesions with straw-colored centers and reddish purple to tan margins. Fully developed lesions are 2 to 5 inches long and from one-half to three-fourths inch wide. The lesions are regular in outline and strongly bordered with a yellow margin. As the spots mature, they become black or sooty (hence the name sooty stripe) with the production of numerous small, superficial structures called sclerotia. These are hard, resting bodies of the fungus that give rise to new infections in subsequent years.

Sclerotia production is a key diagnostic characteristic separating sooty stripe (*Ramulispora sorghi*) from other leaf spotting diseases such as leaf blight (*Exserohilum turcicum*) or gray leaf spot (*Cercospora sorghi*).

Disease management strategies include crop rotation or destruction of infected leaf debris as a means of reducing initial inoculum originating from the sclerotia, and the use of genetically resistant varieties where available.

David S. Wysong
Extension Plant Pathologist

Winterize sprayers now to avoid problems later

When fieldwork is completed, it's time to start thinking about storing equipment for winter.

Here's a compilation of tips offered to ensure your sprayer is ready for a fast, troublefree start next season.

Clean and wash the sprayer, both inside and out. Triple rinse fertilizer and ag chemical sprayer tanks, plumbing, and booms with water.

Drain and rinse foam marker tanks and rinsewater tanks. Open and drain any other tanks, being sure not to forget agitation lines or chemical inductor lines.

Remove or disassemble the filter housings, since they can hold liquid over the winter. Remove the lowest plug on the pump housing for the most thorough draining.

Remove all nozzles, and if they're equipped with diaphragm-type check valves, loosen the caps on the diaphragms and drain completely.

Use an RV-type antifreeze—a nontoxic liquid that's normally pink in color—to flush the tank and booms. Standard automotive

See page 154 for a checklist for maintenance on nitrogen applicators.

antifreeze or windshield washer fluids are less desirable since many tend to be toxic or dry out seals.

Position tank plumbing valves so antifreeze circulates throughout the agitation system and the chemical inductor. Once the liquid has circulated throughout the tank and hoses, open the booms (remember to retighten your diaphragm check valves) until the liquid is clearly discharging from the nozzles. A small amount of antifreeze can be left in the tank.

Circulate RV antifreeze in the foam marker tank and discharge foam marker lines.

Disconnect any other electronic controllers from the battery. Remove the battery and store it in a cool (not cold) area.

While the spray booms are typically greased as part of daily maintenance, it's always best to

lubricate all joints just prior to storing the equipment for winter.

When a rig is stored outside, cover the rubber accordion-type boots to protect against the sun's rays, which will deteriorate the rubber over time.

Check hoses on liquid systems for wear and aging.

Check nozzles for wear, using a new nozzle as comparison.

Touch-up any chipped paint or areas beginning to rust. Running gear made of mild steel, such as the frame and axle, should be painted.

Perform necessary maintenance or repairs, such as replacing shaft bearings and chains before the equipment is stored for the winter.

Save equipment maintenance records.

Robert Grisso
Extension Engineer

Precipitation projections

The following soil moisture projections were calculated by Al Dutcher, State Climatologist, UNL Department of Agricultural Meteorology. See the Sept. 16 *Crop Watch* (94-20) for more information on how to use these soil moisture and precipitation tables.

Expected Precipitation for the Period 10/10/94 - 3/31/95 at the Following Probability Levels.			
Location	75%	50%	25%
Grand Island	6.72	5.05	3.59
Lincoln	8.55	6.50	4.60
Omaha	9.10	7.21	5.23
Norfolk	8.10	6.25	5.05
North Platte	5.33	4.20	3.14
Scottsbluff	3.50	2.68	1.93
Valentine	5.80	4.46	3.42

Nebraska/Kansas crop updates

Harvest continued across much of the state this week as relatively good weather was prevalent after last week's rains. The Nebraska Agricultural Statistics Service reported Monday that corn harvest was slightly ahead of normal with 29% of the crop harvested. Soybean harvest also was slightly ahead of normal with 64% of this year's crop reported harvested. As of Oct. 9, 33% of the sorghum crop had been harvested, compared with 4% at this time last year and a five-year average of 28%.

Winter wheat seeding was reported to be nearly complete with emergence rated at 84%. Kansas reported similar luck seeding their winter wheat, with 75% of the acreage seeded by Oct. 7, slightly behind the average. Dry conditions in central and western Kansas resulted in thin and spotty stands. Crop condition is reported to be 33% good, 51% fair and 1% poor to very poor.

The Kansas sorghum crop is mature, well ahead of 60% in 1993 and the average of 65%. Harvest was well ahead of normal. Condition is rated 74% good to excellent, 23% fair and 3% poor to very poor.

Location	Estimated Soil Moisture				Projected Soil Moisture on 4/1/95 Under the Following Precipitation					
	Field Capacity		as of 10/10/94		Probability Levels.					
	in	%	in	%	75%		50%		25%	
	in	%	in	%	in	%	in	%	in	%
Grand Island	12.0	100	3.6	30	8.3	69	7.1	59	6.1	51
Lincoln	12.5	100	7.5	60	12.5	100	12.0	100	10.7	86
Omaha	12.5	100	8.4	67	12.5	100	12.5	100	12.1	97
Norfolk	14.5	100	11.5	79	14.5	100	14.5	100	14.5	100
North Platte	12.0	100	3.2	27	6.9	57	6.1	51	5.4	45
Valentine	7.0	100	1.9	27	6.0	86	5.0	71	4.3	61
Scottsbluff	11.0	100	1.1	10	3.6	33	3.0	27	2.5	23

NH₃ applicator maintenance checklist

	Yes	No	Date	
1.	_____	_____	_____	Is the tank free of any leaks?
2.	_____	_____	_____	Is the tank's paint in good condition?
3.	_____	_____	_____	Are all transfer valves identified as liquid or vapor?
4.	_____	_____	_____	Is the pressure relief device free of debris and water?
5.	_____	_____	_____	Is the rain cap in place over the pressure relief device?
6.	_____	_____	_____	Is the transfer hose in good condition—free of cracks, cuts, and soft spots?
7.	_____	_____	_____	Are the hose couplings in good condition?
8.	_____	_____	_____	Are the pressure relief devices free of dirt and paint?
9.	_____	_____	_____	Are all pressure and liquid level gauges working and in good condition?
10.	_____	_____	_____	Does the flow control valve appear to be in good condition?
11.	_____	_____	_____	Does the regulator appear to be in good condition?

Nebraska weather update

	Soil temperature						Precipitation			
	Ave.	Seven-day summary ending on 10/10					9/26-10/9		4/1-10/9	
		Norm.	Dep.	Hi/Day	Lo/Day	Last Reading	Act.	Nrm	Act	Nrm
Ainsworth	57.3	60.2	-2.9	62/3	54/5	56.6	.81	112	15.74	88
Alliance	52.4	58.4	-6.0	60/2	48/4	53.4	1.59	338	6.55	48
Arthur	56.5	58.5	-2.0	61/2	54/6	55.4	1.10	204	13.10	84
Beatrice	60.9	62.8	-1.9	65/1	57/6	57.7	1.47	120	18.91	82
Central City	58.7	62.0	-3.3	63/3	55/6	55.7	NA	NA	NA	NA
Clay Center	59.3	62.8	-3.5	64/3	56/6	56.9	.35	34	18.11	87
Concord	55.6	60.0	-4.4	61/3	52/6	52.6	1.07	99	20.14	100
Curtis	58.9	60.9	-2.0	62/3	56/6	57.7	.98	161	10.40	62
Elgin	56.5	59.8	-3.3	61/3	53/6	54.1	.28	31	15.20	78
Gordon	52.5	57.8	-5.2	59/2	49/5	52.2	1.85	394	12.68	87
Grant	58.9	61.6	-2.7	63/2	57/5	58.2	1.23	262	9.25	61
Holdrege	60.7	61.9	-1.2	66/3	56/6	56.5	.43	49	16.39	83
Lincoln	61.1	62.4	-1.3	65/3	58/6	59.4	.54	46	18.05	85
McCook	59.8	62.8	-3.0	64/3	56/6	57.2	.20	32	13.15	81
Mead	59.8	61.9	-2.1	63/3	56/7	56.0	.31	20	21.29	81
North Platte	54.5	59.7	-5.2	60/2	50/5	52.4	1.26	221	14.25	92
O'Neill	58.8	59.7	-1.0	63/3	55/6	56.9	.16	20	20.79	114
Ord	59.7	59.7	.0	64/3	57/6	57.7	.43	51	20.55	109
Red Cloud	60.3	62.3	-2.0	66/3	56/6	56.9	.66	67	14.04	68
Rising City	75.4	61.5	13.9	80/3	71/6	72.8	.71	63	20.12	103
Scottsbluff	53.2	59.6	-6.4	60/2	50/4	52.2	.94	225	5.75	50
Shelton	59.3	61.3	-2.1	64/3	56/6	56.9	.62	68	17.94	.94
Sidney	49.6	58.3	-8.7	56/2	46/5	50.7	2.72	647	13.66	102
Tarnov	58.4	60.3	-1.9	62/3	55/6	55.6	.20	21	19.13	96
West Point	56.4	60.4	-4.0	61/3	53/6	53.0	.63	56	22.83	107

Soil temperature in Fahrenheit at 4 inches