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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 2003-3
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Cutworm numbers high in neighboring states

Check wheat fields early for insects

Winter wheat may be at risk of damage from several insects that may develop earlier or be more numerous due to the recent mild winter or the dry conditions the last few years. In 2002 winter wheat in western Nebraska experienced severe army cutworm problems, stemming from slow regrowth of the wheat under dry conditions coupled with increased cutworm problems. There were reports of increased army cutworm problems in southwest Colorado this winter and we are already getting reports of problems in southern Kansas and southeast Colorado this spring.

Growers need to be evaluating this situation as winter wheat begins to break dormancy. Eggs are laid throughout the fall, and larvae begin to feed later in the fall or winter when conditions are warm enough. These larvae will develop through the winter and be half grown in the spring when conditions become consistently favorable. The army cutworm is really the only cutworm of significant size likely to be present this early in the spring. The larvae are pale gray with a lighter broad band on the upper surface and a narrower light band along the side. Insects will grow to 1 ½ to 2 inches in length. At any one time a cutworm population would likely include insects of greatly varying sizes.

Scout wheat for insects as soon as it breaks dormancy. Reports of army cutworms have been higher than normal in neighboring states this year.

Wheat (and alfalfa) should be monitored at green-up to determine if army cutworm populations are high enough to cause concern. Larval densities of four or more per square foot may warrant treatment. If the plants are stressed and regrowth is slow, lower cutworm densities (two or more per square foot) may warrant treatment. In determining the need to treat, consider the stress level and vigor of the plants, their ability to regrow, and the yield potential in the absence of insects. Often these insects have a spotty presence in the field with higher populations on the edges or other areas. These infestations may best be handled with spot

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Inside

Outlook dry for Nebraska summer

Most of Nebraska is predicted to be drier than normal this summer, according to predicted anomalies of 2003 spring and summer temperature and rainfall for eight sub-climate regions in Nebraska. The predictions were made using a statistical model and precipitation and temperature data from 1895 to 2002. The model breaks down historical variations for a variable such as precipitation, and then synthesizes the variances to make a projection. Maps showing the anomalies are available on the NU School of Natural Resource Sciences Web site at *http://snrs.unl.edu/climate/prediction.*

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Updates

New publications

The following new or revised publications are available from your local Cooperative Extension office or online.

- Selecting Alfalfa Varieties for Nebraska at *http://www.ianr.unl.edu/pubs/fieldcrops/EC153.pdf*
- Fertilizing Proso Millet *http://www.ianr.unl.edu/pubs/fieldcrops/g924.htm*

Management tip

The six-month notice policy that applies to annual cropland leases does not apply to pasture leases in Nebraska. A 1955 Nebraska Supreme Court decision stated that pasture leases may be terminated without giving six months notice if the pasture lease is for less than 12 months. The pasture lease period in Nebraska generally is from May through October. Tenants should contact their landlords to make sure their pasture lease is going to be renewed.

Outlook dry

(Continued from page 21)

A summary of the predictions follows. For spring, most of the state will have near normal precipitation with a slightly wetter (10% above average) situation in the west and a drier condition in the east. Most of the state is expected to have slightly cooler temperatures (within 8°F) this spring except the Panhandle where temperatures are expected to be in the normal range.

The outlook for summer is not very optimistic, however. Most areas of the state are predicted to be on the dry side with possible severe dryness in the northern portion of the state. Summer temperatures are predicted to be above normal (by about 8°F) except for the southeast quadrant.

Qi Steven Hu
Extension Climatologist

Technical and conservation planning opened to private industry

Producers enrolled in federal conservation programs may be looking to private industry for help with the required technical and conservation planning.

The 2002 Farm Bill authorized the use of certified technical service providers (TSPs) from private industry to help meet a growing demand that is expected to exceed current staffing capacity of NRCS and conservation districts. Individuals from the private sector, non-profit organizations, and public agencies can be certified for planning, design, layout, installation, and checkout of approved conservation practices. NRCS and conservation districts have traditionally provided these technical services, and will continue to do so; however, funds will now be available to reimburse producers who choose to use certified TSPs.

Individuals wanting to be TSPs may work through professional organizations – such as the American Society of Agronomy and the Society for Range Management – or they can prove privately that they meet the required qualifications. can prove their experience and education andthrough other routes. (The process is relatively streamlined for certified crop advisors in the ASA program with credits in the appropriate categories for which they're seeking TSP certification.)

An NRCS Web site (*see box*) provides further information on the steps to becoming a TSP, the 35 technical service categories and criteria options for certification in each category. One of the first steps in the process is applying for an on-line electronic government account at your local USDA Service Center. This will provide access to resources and forms, many of which can be filed on-line. An American Society of Agronomy Web site (see box) also provides information on how CCAs can be certified as TSPs.

For information on CCA programs in Nebraska, contact Dee Peterson, Nebraska CCA coordinator, at the Nebraska Agri-Business Association at 476-1528.

Key information on becoming a technical service provider is available at:

- Certified Crop Advisor, the American Society of Agronomy Web site at *http://www.agronomy.org/cca*
- Technical Service Provider Registry, the NRCS Web site at *http://techreg.usda.gov/*

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Wheat insects *(Continued from page 21)*

or border treatments to eliminate problems before they spread further in the field.

A related insect that tends to be much more problematic during consecutive years of dry conditions is the pale western cutworm. Pheromone trapping in the southern Panhandle has indicated that moth populations have been increasing the last few years and are at levels of concern. This insect is much more damaging than the army cutworm as it feeds at the crown and cuts tillers off below the soil line. Because the pale western cutworm overwinters as an egg and hatches early in the spring, its development is delayed compared to the army cutworm. The pale western cutworm is pale gray and does not have distinct striping or markings. It will grow to be about 1 1/4 inches in length.

Normally, serious damage (cutting of tillers) will begin a few weeks after spring regrowth begins and continue into early to mid May. Cutworms tend to be more serious in dry and loose soil areas (e.g. hillsides, hilltops) and can result in serious stand losses in these areas or in very serious cases across the whole field. Wheat growers are urged to be diligent in looking for this insect across western Nebraska this spring. Cutworm densities of one to two per square foot can result in serious reduction in tiller density. Again, plant conditions and density will impact the potential for significant damage.

If economically justified, both species of cutworms are best controlled with pyrethroid insecticides. For more information on management and control of these cutworms, refer to the:

- NU NebGuide G93-1145, *Management of the Army Cutworm and Pale Western Cutworm*, available at local Extension offices or online at *http://www.ianr.unl.edu/pubs/insects/g1145.htm;*
- NU Department of Entomology Integrated Pest Management Web site at *http://entomology.unl.edu/fldcrops/pestipm.htm;* or the
- High Plains Integrated Pest Management Web site at *http://www.highplainsipm.org.*

Table 1. Decision guidelines for early spring brown wheat mite infestations in winter wheat. *(Source: Kansas State University Cooperative Extension)*

Mites per inch of row	*Population*	*Significance*
<25	light	No impact
50-150	moderate	Yield impact unlikely significant
>200	heavy	Potential for yield impact only if natural decline of mites not expected soon

Damage *(above)* caused by the brown wheat curl mite *(right)* in wheat. *(Photos courtesy of Phil Sloderbeck, Kansas State University Extension.)*

Another pest that tends to be much more of a problem in dry years is the **brown wheat mite**. The brown wheat mite will be active in the fall and in the spring until temperatures are consistently warm in late April or May. It is rusty-brown and about the size of a period on a printed page. When viewed under a magnifier, its front legs are noticeably longer than its other legs. This mite feeds on the wheat leaf and causes a yellow mottling on the leaf. Severely damaged leaves will look brown or bronze.

Brown wheat mites are generally only severe when wheat is also severely drought stressed. Treatment decisions for the mites are difficult because heavy rains will tend to reduce mite populations and eliminate drought stress on the plants. However, without rain the plants will continue to be stressed even if the mites have been controlled. Kansas State entomologists have established three risk levels based on brown wheat mite density on winter wheat (see *Table 1*). The highest density level (more than 200 mites per inch of row) is comparable to about 20-50 mites per leaf on 9-12 inch tall wheat. 'Heavy' mite populations may warrant treatment to keep plants alive until they can get adequate rainfall if rain or natural decline with warm weather are not expected in the near future. Treatments with dimethoate or Lorsban 4E-SG should provide enough control to limit populations.

Mite problems are more likely to be severe in continuous wheat or where volunteer wheat was present through the previous winter, allowing for mite population build up. Preventing green plant material (e.g. volunteer wheat) from being present from the fall through early spring will reduce the potential for damage to next year's wheat crop.

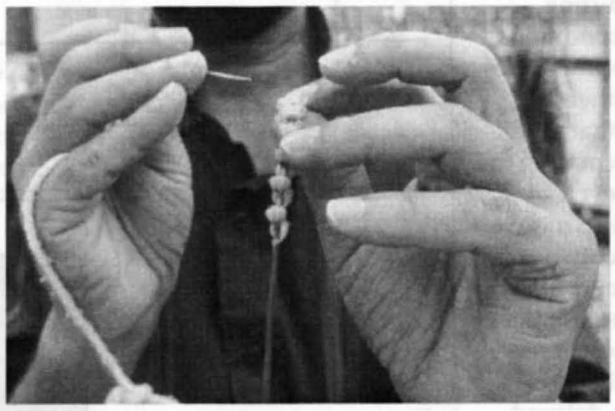
Gary Hein
Extension Entomologist
Panhandle REC

Developing successful wheat varieties is a 12-year process of breeding, testing, trials

Varieties developed by the cooperative University of Nebraska and USDA-ARS Wheat Improvement Team are grown on about 70% of the wheat acres in Nebraska and are widely grown in Wyoming, South Dakota, Colorado, and Kansas. The University of Nebraska, the federal government, and wheat growers through their check-off program generously support this effort. Our goals are to provide wheat producers with the best adapted, highest yielding varieties that can withstand drought, heat, disease, pests, and other adverse conditions. In addition the harvested grain must meet market standards (have good test weight, high protein content, few yellow berries, etc.) and have excellent bread making quality.

In any breeding program, there are three main phases. The first phase, which usually takes one to two years, is the introduction of genetic variation. This is done by crossing two or more wheat lines. The parental lines can be varieties, but often are experimental lines or even exotic lines that have useful traits. For example, no variety currently released has wheat streak mosaic virus resistance so our crosses for this trait involve experimental lines.

Once the cross is finished, the second phase is inbreeding and selection. Inbreeding is done by selfing (wheat is a naturally self-pollinated plant) so the inbreeding process consists of simply growing the plants and harvesting their seed. We use a breeding method know as bulk breeding in which the progeny are planted and harvested in bulk. The advantage of bulk breeding is that it allows nature to do some of the breeding work. The bulks are initially grown at Mead because it has a harsh winter and will kill winter-tender plants. Also, because it is out of the main wheat-growing region, we can infect plants with stem rust and select for resistant plants. The inbreeding and selection process takes six to seven years. We begin with over three million plants but by the end of this process, we have less than sixty lines. Each of these lines will have winter hardiness, stem rust resistance (thanks to researchers in the NU Department of Plant Pathology), an indication of high agronomic performance, and acceptable bread making quality (thanks to our NU Wheat Quality Laboratory).



A UNL researcher crosses two wheat cultivars to develop a third with the sought-after attribute. Hundreds of crosses will be made and tested in the development of a single new variety.

The final step takes five years and is known as the evaluation phase. Extensive testing is conducted to provide enough information to decide whether the lines should be released as a variety and, if so, where the new variety would be best grown. Our main breeding nursery locations are Mead, Lincoln, Clay Center, North Platte, Sidney, and Alliance. We formerly also tested at McCook and Grant, but current budget restrictions prevented testing at these sites, although we hope to include them again in the future.

We wanted to test in the major wheat growing regions of the state (east, south central, southwest, and the Panhandle) and at NU farms because we test seed from other states and it is important to make sure we do not bring diseases into Nebraska and and to farmers' fields. Seed from these trials is composited and baked in the Wheat Quality Laboratory. The first trials are in our breeding nurseries. The intermediate trials include regional testing across the Great Plains which is coordinated by the USDA-ARS based in Lincoln. The final trials include the State Variety Trials. The latter trials are very important because they have twice as many locations as our breeding nurseries and are used for field days so producers can see which lines may be released in the future. Before a line is released, it is tested in more than 100 location-years to provide the diverse growing conditions that it may experience at different times and places in Nebraska.

In summary, it takes a minimum of 12 years to create a variety, with over 700 crosses every year. Over three million plants are planted in segregating bulks and 15,000 yield plots are harvested yearly. At the end of his process, if we are very successful, a new variety will be released. As plant breeders we know the odds are not in our favor, but the impact a good variety can have is well worth the effort.

Stephen Baenziger
UNL Primary Wheat Breeder
and Professor of Agronomy
and Horticulture

When selecting herbicides

Consider restrictions on grazing and recropping

As you plan your crop and weed control program for 2003, consider the forage and recrop restrictions for various herbicide choices. With another dry year predicted, having flexibility to plant a forage follow crop may be wise.

Two references can help you avoid foraging and recropping limitations. Both are tables in the 2003 Nebraska Weed Management Guide (EC02-130), which is available at local Cooperative Extension offices or on-line at *http://www.ianr.unl.edu/pubs/fieldcrops/ec130.htm.* The first table lists forage, feed, and grazing restrictions for row crop herbicides (*pages 111-114*). This table is useful if the crop vegetation is to be fed to livestock, and applies both to the green plants and fodder. Some herbicides require a waiting period between application and feeding or grazing, some have no restrictions, and some do not allow any feeding or grazing. It's always better to know the product restrictions before use.

Another table with useful information concerns replant and rotational planting time restrictions for various crops after using a particular herbicide (*pages 104-110*). These time intervals range from no restriction to a number of days or months, the next cropping season, or longer. The table is comprehensive and lists 22 crops and 175 herbicides with 76 footnotes. Still, some crops are not listed, including turnips, which make an excellent temporary forage. Turnips have sensitivity similar to red clover.

There is some safety margin in these tables; however, rate of application, soil, and environmental conditions will greatly affect herbicide persistence and carryover. Herbicides do not degrade in dry soil so keep that in mind when recropping. Nevertheless, these tables provide a quick look at feeding and recropping restrictions for many herbicides. Always check the specific herbicide label for more details.

Fred Roeth
Extension Weeds Specialist
South Central Ag Lab

Even in a dry year

Soybean seed treatments recommended for protection in specific circumstances

Each year producers struggle with the decision of what to put on their soybean seed prior to planting. Of course, this year it's even tougher to decide on an additional investment given the predicted drought conditions. One thing to remember with soybeans is that this is the only time you get to make this decision since there aren't any curative applications which can be made. Therefore, even though drought is predicted for many areas, I still recommend a seed treatment fungicide if you have had stand problems with your soybean fields in the past.

This decision may be even more important in a year with low moisture as seed applied fungicides will affect overall root health in some instances. In many instances we will see increased plant height, which also reflects increased root growth with seed applied fungicides. This does not always translate into yield advantage, but it could be more important in moisture limited years. One of the key factors in whether seedling disease problems develop is how much moisture there is at planting. If fields have a history of stand problems and you get that "timely rain" right after the seed is in the ground, history may repeat itself. While general state predictions may be for a drier weather pattern, localized precipitation at planting could cause problems. It would appear to be prudent to go ahead and put the seed applied fungicide on if you have any of the following conditions:

- History of seedling/emergence problems: if you have a field with a history of stand problems, treat the seed with a good combination product this year.
- Early planting: if you're considering early planting, fungicide seed treatments are a necessity. Cool, wet soils are very conducive to poor stands without treatment. No-till fields will have cool soils later in the season than tilled fields. These will more commonly have seedling disease problems.
- Phytophthora history: fields with a history of Phytophthora will need additional metalaxyl or mefenoxam treatment. Even with resistant varieties, treat fields because those with Phytophthora will generally favor Pythium.

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Insecticide label changes

Label recommendations have been revised for several insecticide products available for use in Nebraska. The following presents information regarding these changes in an abbreviated manner. Follow all label instructions and restrictions. For further information on insecticide recommendations also visit the NU Department of Entomology's Web site, *Biology and Treatment Recommendationsfor Field Crop Pests*, at *http://entomology.unl.edu/fldcrops/pestipm.htm*

Bayer CropScience has announced a 2(ee) recommendation for the use of Baythroid 2 (cyfluthrin) insecticide against army cutworm on alfalfa in Colorado, Kansas, Nebraska, Oklahoma and South Dakota. Use rates are 0.8-1.25 fl oz per acre; use a minimum of 2 gal of spray volume per acre by air or 10 gallons per acre by ground.

Baythroid 2 is now labeled for use on corn and soybeans. Use rates on corn are 0.8-1.6 oz per acre for black cutworm; 1.6-2.8 oz per acre for armyworm, chinch bug, corn earworm, corn rootworm beetle, stink bugs, European corn borer, flea beetle, stalk borer, southern corn leaf beetle; 2.1-2.8 oz per acre for grasshoppers; 2.8 oz per acre for fall armyworm. Use rates on soybeans are 0.8-0.16 oz per acre for cutworms, potato leafhoppers, thrips; 1.6-2.8 oz per acre for armyworm, bean leaf beetle, blister beetle, cabbage looper, green cloverworm, saltmarsh caterpillar, velvetbean caterpillar; 2.1-2.8 oz per acre for grasshoppers.

FMC's Mustang Max (zeta-cypermethrin) replaces Mustang EW. The use rates for Mustang Max differ from Mustang EW. It is labeled against a variety of insects on field corn, seed corn, popcorn, sorghum, soybeans, alfalfa and wheat. See the label for rates and restrictions.

FMC has announced a label change for Capture 2EC insecticide (bifenthrin); the re-entry interval is now 12 hours for all uses and all crops.

Syngenta's Cruiser 5FS insecticide (thiamethoxam) is labeled as a corn seed treatment for protection against injury from early season insects such as wireworm, seed corn maggot, southern corn leaf beetle, chinch bug, flea beetle, white grub on field corn, popcorn, seed corn and sweet corn. The pretreated seed is labeled at a rate of 1.28-5.1 fl. oz per 100 lbs of seed.

Bob Wright, Extension Entomologist, South Central Agricultural Laboratory

Seed treatments

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The most common fungi involved in seedling diseases in Nebraska are species of *Fusarium, Phytophthora, Pythium*, and *Rhizoctonia.* All four are capable of killing soybean seedlings or causing yield-limiting damage. Fields with a history of Phytophthora problems should be planted into a resistant variety. Fields with a long-term history of Phytophthora may require a different resistance gene if you notice Phytophthora killing the variety planted. In addition, fields with a history of Phytophthora will require levels of mefenoxam or metalaxyl above the standard rate. See extension publication entitled, "Management of Phytophthora Diseases of Soybean" (*NF02-518*).

Not all seed treatment fungicides are compatible with Rhizobium inoculants. Always check the label for compatibility. If the seed is treated with a fungicide, apply inoculants in-furrow rather than on the seed when possible unless the label requires otherwise. Many products require that seed be planted within as short a time as four hours after inoculation with some liquid based Rhizobium inoculants.

Loren Giesler
Extension Plant Pathologist

Salvage thin alfalfa stands by overseeding

Many new alfalfa seedlings may not have survived last summer's drought; however, fields with partial stands can be salvaged by thickening them with extra seed.

Begin by evaluating current alfalfa stands. For maximum production, alfalfa fields should come out of the first winter with 10 to 25 plants per square foot, depending on production potential.

Thicken only those areas within the field that need it and skip over those that don't. Drill new seed as early as possible in the spring. Any delay can be detrimental to the new plants by increasing the risk of weeds and competition.

Drill new seed only about a 1/4 inch deep, using a drill that can cut into untilled soil. A grain drill with a box for small seeds will usually work, but sometimes a more rugged no-till drill is needed. Use five or six pounds of seed per acre for fields with at least half a stand. For fields with less than a quarter of a stand, use a full seeding rate.

Take the first cut extra early to help open the canopy so new seedlings can get more sunlight. To kill moisture-robbing weeds, use Poast, Select, Buctril, Pursuit, Raptor and Butyrac. They can selectively control grassy or broadleaf weeds with out harming new alfalfa.

Bruce Anderson
Extension Forage Specialist

Be leary of gypsum claims; consider value, cost

The following article from South Dakota State University was recommended to our readers by Charles Shapiro, NU soils scientist -- crop nutrition at the Haskell Ag Lab at Concord. He said the information would also apply to Nebraska production situations.

In the last 12 to 18 months there has been a flurry of sales activity for gypsum. The salesmen have been telling producers many half-truths and some outright deceptions. But like anything you are thinking of buying, Don't believe everything you hear. Some of the claims being made for gypsum include: 1) improving high pH soils by lowering pH; 2) increasing the ratio of calcium to magnesium; and 3) improving soil tilth and permeability.

Gypsum is calcium sulfate ($CaSO_4$. $2H_2O$). In its natural form it also has a couple of water molecules associated with the molecule. It has 23% calcium and 19% sulfur. Fertilizer grades are commonly slightly less than these analyses. It dissolves rather easily and forms Ca^{++} and $SO_4^{=}$ ions in the soil solution. Because calcium is positively charged, it will attach to soils and 'push off' other positively charged cations such as hydrogen (H), potassium (K), magnesium (Mg) and sodium (Na). The sulfate ion is negatively charged and like nitrate will move with water and can leach or move out of the root zone if enough precipitation or irrigation is received.

Gypsum is of value – in the right situations. Gypsum has been shown to be of value in reclaiming sodic (high sodium) soils. Sodium is often found with high salt areas. These areas are usually very small compared to the total area in the field. Although we see some of these sodic soils in eastern South Dakota, most are located in central and western SD. Too much sodium on a soil will cause clays to move apart and repel each other –thereby plugging soil pores with clay. This tends to inhibit water and root movement and makes the soil compact and hard when dry. The calcium from the gypsum replaces sodium on the soil. If there is enough water, the replaced sodium eventually can be flushed from the soil profile, improving soil tilth. Typical gypsum rates to accomplish this range from 1 to 3 tons per acre. This is 6 to 20 times more than the 300 lb per acre rate recommended by some gypsum sales representatives.

Table 2. Influence of added gypsum on crop yields, South Dakota, 2002.

	Site/crop			
Gypsum rate lb/a	*Houghton wheat*	*Warner wheat*	*Beresford corn*	*Beresford soybean*
	bu/a			
0	39	44	129	28
300	42	43	133	31
1500	—	—	141	27
Stats:	NS	NS	NS	NS

Gypsum will also work for a sulfur source – although it is 2-2 1/2 times as expensive as the sulfur in ammonium sulfate, for example.

Gypsum *can not lower soil pH* as it is a neutral salt. Gypsum can not improve salt affected soils, unless they are also sodic as discussed above. Gypsum is a salt and will simply increase any salt problem. Improving soil tilth and permeability by adding gypsum is only accomplished in sodic soils. There has been no scientific data showing addition of gypsum improves permeability in typical South Dakota soils. Crop yields were not improved with added gypsum at four sites in 2002 (*see table*).

Gypsum promoters typically claim that magnesium is bad and calcium is good and you are adding calcium with gypsum. This is rubbish! There have been agronomic studies in Wisconsin and Ohio showing no advantage to decreasing magnesium or increasing calcium levels (changing the Ca:Mg ratios) for crop production.

Adding 300 lb per acre of gypsum will add 70 lb per acre of calcium which is less than 1% of the exchange capacity of a typical silt loam soil in South Dakota. Therefore such a small amount of calcium – even if added for a number of years – will do nothing in changing ratios, lowering magnesium, or even replacing sodium. This rate is likely based more on salesmanship than science. Who would pay $250 an acre for gypsum? Even if you needed it for sodic conditions, this is difficult to justify economically. But $20-$25 per acre is something that can be sold – therefore the 300 lb per acre rate is born.

Prepared by Ron Gelderman
South Dakota State University

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Cash receipts from farm marketings contribute more than $9 billion to Nebraska's economy each year.

Dryland sorghum performs well in dry conditions in side-by-side trials with corn in 2002

Recent hybrid trials conducted in central Nebraska resulted in sorghum matching or outyielding corn in most years. In addition, grain sorghum is less expensive to produce and less risky in dry years. However, there are good reasons to plant dryland corn, including better herbicide selection and greater maximum yield potential. There also are good reasons to plant both crops, including the benefits of crop rotaton and spreading out field work.

Following last year's drought producers who farm dryland or fields with limited irrigation water may be asking themselves whether they should plant grain sorghum or corn To better address this question, University of Nebraska researchers have conducted side-by-side hybrid trials for the last six years in south central and for five years in southeastern Nebraska.

Seasonal available moisture is a major factor affecting differences in dryland corn and sorghum yields.

Sorghum has looked very good in these trials, having the highest single yielding hybrid at 177 bushels per acre and outyielding corn four of the last six years in south central Nebraska. The same conclusion can not be drawn from the southeast Nebraska trials, in part due to less data. However, sorghum clearly outperformed corn in 2002 in both southeast and south central Nebraska. Following is a synopsis of the 2002 trials and conclusions drawn from the multi-year trials.

2002 Results

The 2002 trials were conducted in Harlan and Gage counties. In Harlan County, where it was extremely hot and dry all summer, 20 corn hybrids were planted in the same field with 17 sorghum hybrids. Both crops were planted no-till into wheat stubble that had minimal subsoil moisture. Corn yields ranged from 1 to 39 bushels per acre with an average of 14 bushels per acre. Sorghum yields ranged from 45 to 84 bushels per acre with a 63 bushel per acre average.

In Gage County, which also was hot and dry much of the summer, 60 corn hybrids and 19 sorghum hybrids were no-tilled into bean stubble with very little subsoil

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Table 1 South Central hybrid trials, top 10 hybrids, bushels per acre.

		Grain Sorghum Yields				*Corn Yields*					*May-Sept Rainfall*
		Max	*Min*	*Range*	*GS Ave*	*Max*	*Min*	*Range*	*C Ave*	*Ave Diff **	*Inches*
1997	Nuckolls	124	113	11	118.3	107	85	22	92.8	-25.5	16.5
1998	Webster	177	152	25	161.6	172	136	36	145.9	-15.7	12.5
1999	Nuckolls	122	109	13	114.8	110	94	16	97.5	-17.3	20.0
2000	Nuckolls	136	123	14	129.7	149	126	23	133.4	3.7	19.5
2001	Webster	148	138	10	141.9	160	139	21	147.4	5.5	24.0
2002	Harlan	84	62	22	68.9	39	13	26	23.0	-45.9	7.0

Table 2. Southeast hybrid trials, top 10 hybrids, bushels per acre.

		Grain Sorghum Yields				*Corn Yield*					*May-Sept Rainfall*
		Max	*Min*	*Range*	*GS Ave*	*Max*	*Min*	*Range*	*C Ave*	*Ave Diff **	*Inches*
1998	Otoe	158	135	23	141.9	154	133	21	140.1	-1.8	22.0
1999	Gage	170	143	27	152.0	No data					22.5
2000	Lancaster	Hailed out			0	95	83.9	11	87.9	87.9	24.0
2001	Lancaster	131	99	32	109.1	171	143	29	150.6	41.5	26.5
2002	Gage	72	32	40	46.0	Crop failure			0	-46.0	14.0

* The average difference represents the corn average minus the grain sorghum average.

Dryland sorghum/corn (Continued from page 28)

moisture. None of the corn hybrids produced grain. Several of the sorghum plots had poor stands. All sorghum hybrids averaged 34 bushels per acre and ranged from 12 to 72 bushels per acre. The top 10 sorghum hybrids averaged 46 bushels per acre with a range of 32 to 72 bushels per acre.

For a summary of the side-by-side trials for each year from 1997 to 2001, view the fuller story and data on the *CropWatch* Web site at *http://cropwatch.unl.edu/archives/2003/crop03-3.htm#sorghum*

When we started this project, we expected that sorghum would outyield corn in dry years, corn would outyield sorghum in wet years, and they would have similar yields in average years. The hybrid trial data show that the corn and sorghum yield comparison was uncertain in the range of 20 to 24 inches of rainfall. Where moisture conditions were less favorable, sorghum was usually the better yielding crop and corn was the better yielder with good rainfall. It also appears hybrid selection is more important with corn than with sorghum because of a wider yield range for corn observed particularly in the south central plots. Data in *Table 1*, which shows the sorghum and corn yield ranges by year for the south central trials, indicate the yield range for the top 10 hybrids is consistently higher for corn. *Table 2* provides data for the southeast Nebraska trials.

Other related results

A study conducted at Mead from 1984 to 2002 compared corn and grain sorghum following soybeans and provided similar results. When May-September precipitation was below 14.5 inches, sorghum outyielded corn over 70% of the time for an average of 5.5 bushels per acre. When precipitation was in the 14.5-20.0 inch range corn outyielded sorghum 70% of the time for an average of 22.8 bushels. Corn outyielded sorghum over 90% of the time when precipitation was over 20 inches in May through September with average corn yields exceeding sorghum by 42 bushels per acre.

Table 3. Distribution of May-September precipitation by location.

Inches	*Wymore*	*Geneva*	*Minden*	*McCook*
<10	2.3%	2.3%	9.1%	15.9%
10-15	13.6%	15.9%	29.5%	52.3%
15-20	29.5%	40.9%	31.8%	25.0%
20-25	27.3%	25.0%	18.2%	6.8%
25-30	15.9%	11.4%	6.8%	
30-35	9.1%	4.5%	4.5%	
>35	2.3%			

Rainfall differences

Whether a producer should expect to have sufficient moisture for corn depends on subsoil moisture and where the farm is located. More than 40 years of weather data is summarized in *Table 3*. As the table indicates, May through September precipitation has been below 15 inches nearly 70 % of the time in McCook. If subsoil moisture were below normal at the start of the season and 5 inches of rainfall could be expected to make up the deficit, one would have to expect 20 inches or more rainfall in the growing season to make up for the subsoil moisture deficit and have the 15 inches or more required to be better off planting corn. McCook has received 20 inches or more only 6.8% of the time (3 in 44 years). The odds look better in Minden and Geneva, but one would have to be as far east as Wymore in Gage County before there would be better than a 50% chance of receiving 20 inches or more.

In on-farm situations, dryland corn may have appeared to yield better because it was usually planted on the best land (most fertile, best subsoil moisture, and most residue cover) while sorghum was planted on the poorer land (eroded hillside with less subsoil moisture and less residue cover). The data reviewed here suggest that when both are planted into the same conditions, sorghum will outyield corn when growing season rainfall is less than 15 inches and corn could be expected to outyield grain sorghum when growing season rainfall is 25 inches. Subsoil moisture levels at the beginning of the growing season also would influence the rainfall needed to favor planting corn. Also the timing of rainfall would influence the amount needed.

Figuring the economics

In addition to yield differences, typically there also are differences in price and production costs. Over the last 10 years, grain sorghum prices in Nebraska have averaged about 25 cents per bushel below the corn price. However, grain sorghum prices actually have exceeded corn prices on several occasions in recent years and the loan rates are the same under the current farm program. (In mid-March grain sorghum prices were quoted in Aurora at a 5 cent premium above corn.)

Since production costs are lower for sorghum, by as much as $12 per acre for seed alone, sorghum generally requires less than a 10%

(Continued on page 30)

Dryland sorghum/corn *(Continued from page 29)*

yield advantage to net more than corn. For example using 10-year average prices received by Nebraska farmers, 107 bushel grain sorghum at $2.10 per bushel (107 x $2.10 = $224.70) would be more profitable than 100 bushel corn at $2.35 per bushel at a $12 per acre higher production cost (100 x $2.35 -$12 = $223). If yields are below 40 bushels per acre, corn must yield more than sorghum to be the most profitable alternative at $2.35 corn, $2.10 sorghum and an additional $12 per acre cost of growing corn. However, at these yield levels, sorghum typically outyields corn.

Crop insurance

Crop insurance coverage may be an additional consideration in choosing between corn and grain sorghum, particularly when beginning the year with low subsoil moisture. For farms that have a higher proven yield for dryland corn than grain sorghum, it might appear an insured producer would be better off in case of crop failure to have planted corn. However, this conclusion is not necessarily correct, since multiperil premiums are generally higher per dollar coverage for corn. Consider an actual example in Clay County where one could buy 70% coverage on a 100-bushel sorghum yield with a $2.10 per bushel price election or 60% coverage on a 120-bushel corn yield at $2.20 per bushel price election for a premium of $2.24 per acre. The corn coverage would generate an indemnity of .60 x 120 x $2.20 = $158.40 per acre in case of complete crop failure and would realize $143.96 per acre net of premium and an additional $12 per acre growing costs. The sorghum would generate a maximum indemnity of .70 x 100 x $2.10 = $147 per acre or $144.21 net of premium in case of complete crop failure, slightly more than corn. Further, if you were to raise some sorghum (but corn would have failed completely) and the market price is above the indemnity price, you would gain even more from having planted sorghum even though in our example the yield guarantee on the sorghum, .70 x 100 = 70 bushels, is slightly less than the yield guarantee on the corn, .60 x 120 = 72 bushels and the insurance premium on sorghum is slightly higher. Producers are encouraged to ask their insurance agent for help in making their own comparison.

Conclusion

There are several good reasons to produce dryland corn, including better herbicide selection and better maximum yield potential in excellent years; however, sorghum appears to be a better bet if you are in an area expected to have less than 15 inches of available moisture net of any beginning subsoil deficit. In better moisture conditions planting both corn and sorghum would help diversify the risk. Limitations of the comparisons we have provided include not incorporating beginning subsoil moisture in the analysis of the trials examined and failure to consider the effect of adjusting plant populations (particularly in corn) under drier conditions.

For more information, contact your Cooperative Extension Office or view the hybrid test results on the web at *http://varietytest.unl.edu.* For historical precipitation in your area see the web site *http://hprcc.unl.edu/products/historical.htm.* Data from the Mead experiment is available in a forthcoming Agronomy Journal article: "Soybean nitrogen contribution to corn and sorghum in two-year cropping systems in the Western Corn Belt," by G.E. Varvel and W.W. Wilhelm.

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Dormant spray alfalfa weeds

Achieving cleaner, healthier alfalfa at first cutting requires treating winter annual weeds in alfalfa during the next burst of spring-like weather. Weeds like pennycress, downy brome, mustards, cheatgrass, and shepherd's purse are common in first cut alfalfa. They lower yields, reduce quality, lessen palatability, and slow hay drydown. If you walk over your fields today you probably will be able to see their small, green, over-wintering growth. Once alfalfa starts growing, it will be difficult to control these weeds.

Several herbicides can help control winter annual grasses and weeds in alfalfa. They include Karmex, Sencor, Velpar, Sinbar, Pursuit, and Raptor. They all control mustard and pennycress. Karmex and Pursuit do not control downy brome very well, but Karmex has enough residual soil activity that can help control a few summer annual grasses like foxtail and barnyardgrass.

To be successful, though, you must apply most of these herbicides soon -- before alfalfa shoots green-up this spring -- to avoid injuring alfalfa. If alfalfa shoots are green when you spray, growth may be set back two or three weeks.

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