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ARTICLES IN THIS ISSUE:

Wheat Management Tips

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It's no secret that low market prices and yield-bashing weather conditions have hit Kentucky wheat producers hard the past few years.

Although you can't do much about the weather, following some time-proven management practices will lessen the impact that market and weather conditions have on your farming operation.

These suggestions will help you reduce the negative effects of market prices and weather:

Develop a conscious marketing strategy instead of selling automatically to the cash market at harvest. Establish a break-even price
per bushel by dividing your production costs by the expected yield. The break-even market price should cover both your production costs and living expenses.

Develop a management plan to deal with marketing, production (yield), and financial risks.

To reduce marketing risks, develop trigger price levels to start marketing your wheat crop, perhaps using forward contracting and options. Also set a minimum price for the crop.

Use stable-yielding varieties to counter yield

risks. Taking part in government programs like crop insurance is another tool to reduce production risks.

Machinery management is an important part of dealing with financial risks. Take a close look at what equipment size or machinery capacity is needed for your farming operation. Also evaluate whether it's better to buy new versus used machinery, or to custom hire.

If you're renting land, try to pay with a crop share rather than cash rent. And remember the adage, "save for a rainy day."

It's important to look at cost reduction in an economic sense. Be sure your cost savings is more than the reduced crop value (lower yield times market price); otherwise you'll end up shooting yourself in the foot.

"Input substitution" is one way to reduce costs. Substitute your knowledge and management time for cash-out costs. Educate yourself to make the decisions necessary to produce a profitable crop. Use experimentation and historical data to modify research-based recommendations to fit the situation on your farm.

For instance, put a little more management into weed control. Use the benefits of crop rotation to help control weeds; rotate with corn to take out broadleaf weeds that could be a problem in continuous wheat. And mow field borders where ryegrass seems to be worst to keep combines and other equipment from spreading ryegrass out into fields.

If you're using saved seed, be sure they are weed free and have been thoroughly cleaned.

Remember to monitor fields to determine whether you need to spray for weed or disease problems.

Yes, intensive wheat production is a high-input operation. The high "input" isn't necessarily what you buy and spend; rather it's the input of your knowledge and decision making. When you make the right decision, you've either protected the yield or not spent money you didn't need to spend.

If you're going to plant wheat, it won't cost more to plant at the optimum time; however, it could cost you indirectly if you plant too early or too late. Pay attention to planting depth and the recommended seeding rate. Seed is expensive; so calibrate your drill to get the most out of your seed dollar.

For more information, visit the Wheat Science Group's home page at http://www.ca.uky.edu/ukrec/welcome2/htm or contact your County Cooperative Extension Service.

Wheat Streak Mosaic Virus and Management Considerations for 2000/2001 Crop

Donald E Hershman
Extension Specialist in Plant Pathology

Importance

Wheat Streak Mosaic (WSM) is a potentially devastating virus disease of wheat. In the United States, WSM is most prevalent in hard red winter and spring wheats grown in the central Great Plains region. Soft red winter wheat produced in the mid-south and mid-west is infrequently impacted by WSM. Epidemics are rare in Kentucky with the only recorded ones occurring in 1989 and 2000.

Losses due to WSM may range from negligible to complete crop failures. The entire range of disease severity was evident last year during the spring 2000 epidemic in Kentucky. The most extensive damage was found in scattered fields in Fulton, Simpson, and Warren Counties. Approximately 10% of the wheat fields in those counties were heavily damaged; many of those fields were destroyed and replanted to either corn or soybean. The disease was also evident in most

other wheat-producing counties of the state, but damage was limited primarily to test weight reductions.

Disease Development

Wheat Streak Mosaic Virus (WSMV) is transmitted to wheat by the wheat curl mite, *Aceria tulipae*. The epidemiology of the disease is directly linked to the population dynamics and biology of this tiny mite pest. For more detailed information on the biology of the wheat curl mite, consult the University of Kentucky Department of Entomology publication "Entfact 117" available on the web at: www.ca.uky.edu/Agriculture/Entomology/entfacts/fldcrops/ef117.htm or at Kentucky county Extension offices.

Wheat curl mites and WSMV survive the summer months, prior to wheat planting, on/in a range of grassy crop and weed species, especially volunteer wheat. Grass species often differ in their potential to support either the mite or the virus. Fescue, for example, is an excellent mite host, but is immune to WSMV. Corn is a moderate host for both the virus and the mite. Common weed species which are good hosts for both the mite and virus include: cheat (*Bromus secalinus*), crabgrass (*Digitaria* spp.), and barnyardgrass (*Echinochloa crusgalli*). Although these species are extremely common in Kentucky, apparently none of them contribute significantly towards WSM epidemics. If they did, we would see more evidence of WSM each year. This thesis is backed up by observations and studies from areas where WSM is common. Apparently volunteer wheat (i.e., wheat as a weed) is the only significant host plant (for the virus and mite) which contributes significantly towards the development of WSM epidemics.

In situations where significant levels of volunteer wheat exist, virus and mite populations are maintained at high levels in and on wheat, respectively, during wheat's "off season": that is, the time between the harvest of one wheat crop and emergence of the next crop. Then, if the volunteer wheat is not killed at least two weeks prior to the emergence of wheat in the same or adjacent fields, the mite will move onto the emerging wheat and spread the virus to the young wheat seedlings. Mites move to the emerging wheat by wind.

During the summer of 1999, there was an abundance of volunteer wheat in Kentucky because of poor weed control in doublecrop soybean due to drought conditions. Observation of many fields exhibiting WSM during 2000, in fact, showed an association with volunteer wheat in neighboring fields. However, this was not true in all situations and many fields that were severely affected by WSM were not closely associated with volunteer wheat. This suggests that mites moved into those fields from distant sources in wind currents. Another weakness in the link between volunteer wheat and WSM epidemiology is that many fields throughout the state had minimal WSM, even though significant volunteer wheat problems existed. Apparently other, as yet undetermined, factors also played an important role in promoting or limiting WSM in fields during the fall of 1999 and spring of 2000.

Management Issues

There is some evidence that soft red winter wheat varieties may differ slightly in their reaction to WSMV. However, all varieties currently available can be severely damaged by WSM and, thus, variety selection is of limited value in managing WSM at present. Similarly, there are no data to suggest that any chemical treatment aimed specifically at the wheat curl mite vector will be of value. The only practical means of managing WSM appears to be managing volunteer wheat on an area-wide basis. This is good news for Kentucky producers since in a normal season, volunteer wheat is not a serious problem due to effective weed control, particularly in

doublecrop soybean fields. However, any situation which results in large volunteer wheat populations throughout the summer months should be a cause for concern. In those instances, farmers must make a collective effort to eliminate volunteer wheat, either through chemical or mechanical means, at least two weeks before wheat planting in an area begins. This two-week period will greatly reduce wheat curl mite populations due to a lack of available host tissue. The key, however, is that this effort be undertaken communally. This is because mite control in individual fields will have little impact on area-wide populations of wheat curl mites. Thus, the risk for WSMV infection will still be quite high as long as any significant populations of volunteer wheat remain anywhere within a community.

Having said the above, there is no evidence that volunteer wheat was at the same high level during the 2000 season as it was during 1999 for most of Kentucky. An exception may be in the southern tier counties where much of the rain received in Kentucky was missed. If you are a wheat producer in a county that did experience a summer drought, make sure you heed the warning to destroy volunteer wheat well prior to planting wheat. Also, encourage your neighbors to do likewise and we may be able to avoid another serious problem with WSMV during the 2001 season.

Soft White Wheat- Where Are We?

Dave Van Sanford - Wheat Breeder

This past season approximately 750 acres of soft white winter wheat were grown in Kentucky, along with 400,000 plus acres of soft red winter wheat. All of the soft white wheat was grown under contract through a project organized by the Kentucky Small Grain Growers Association (KSGGA), Siemer Milling, and Bremner Bakeries. In general, growers were very pleased with the performance of the two white wheat varieties, Pioneer Brand 25W33 and 25W60. In addition to performing well in farmers' fields, these two varieties topped the state variety trial (electronic versions of the variety bulletin can be found at these web sites:)

http://www.ca.uky.edu/ukrec/00Rvarie.html or http://www.ca.uky.edu/agc/pubs/respubs.htm.

In addition to high yields, the white wheats have earned the growers a premium, thus increasing their profitability. From the miller's standpoint, white wheat has some advantages: the wheat can be milled closer to the bran, and the white bran itself is of a higher value than the red bran because it can be used in breakfast cereals. White wheat is attractive to the baker, as well, because the bran is not bitter tasting and more fiber can be included in the end product. This meets the demand of our increasingly health-conscious society. Both millers and bakers in Kentucky would prefer to buy locally grown white wheat as opposed to white wheat produced in Michigan, to save on transportation costs.

This fall, approximately 1500 acres of soft white winter wheat will be sown in Kentucky. Growers will be paid a $0.20 premium over the September futures price. This is still a modest acreage, but keep in mind that it has grown from 50 acres in the first year. There is hope that production will increase further, up to 5000 acres and possibly beyond. Because soft white winter wheat is a new market class in Kentucky, it is essential that steps be taken to prevent the two classes from being mixed in commerce. This requires planning, organization, and commitment and therefore the process of growing a new market class moves slowly.

One of the other limiting factors at this point is the small number of soft white winter wheat varieties that are adapted to Kentucky. The wheat breeding project at the University of Kentucky, through support provided by the Kentucky Small Grain Growers Association/Promotion Council, has begun a soft white winter wheat breeding program. As

noted in a previous newsletter article, soft white wheat has a greater tendency to sprout than red wheats during wet weather at harvest. Thus, sprout resistance will be a key breeding objective in our program.

Additional information can be obtained by contacting Todd Barlow of the Kentucky Small Grain Growers Association at (800) 326-0906, or by visiting the KSGGA web site at http://204.255.226.104/.

Calibrate Grain Drills to Control Seed Costs

Sam McNeill, Extension Ag.. Engineer

The goal of every Kentucky wheat producer is to reach the maximum yield potential from each variety they grow. Selecting and achieving the optimum seeding rate during planting is the first step towards this goal, which requires that grain drills be calibrated with each seed variety/lot that's selected. A recent field study has shown that individual seed metering/delivery units on drills can vary by more than 10% above and below the target-seeding rate, which affects seed costs proportionately.

Most drill operator's manuals provide seeding rate tables that are useful for "coarse tuning" your drill but these have been found to vary by 10% or more from measured values in calibration trials for most soft red winter wheat varieties. Operators who calibrate their drills each year and who keep records of their drill settings for a range of seed sizes from year to year can reduce the time required to calibrate their equipment provided that seed of similar size is used.

Seeding rates are typically increased as the planting season progresses. No-till operators' especially match seeding rates to the amount and condition of residue that's encountered at planting time. The degree of residue decomposition, soil and residue moisture, and post-harvest residue treatment (mowed or unmowed) all affect drill performance, stand establishment, final stands, and ultimately yield.

For these reasons, a spreadsheet has been developed to help farmers calibrate their drills, to keep track of their seed costs, and to keep records of their wheat enterprise. Originally developed by Mike Ellis, a Shelby County no-till farmer and crop manager, to facilitate drill calibration, the spreadsheet has been expanded to include seed costs and other useful information.

An example of the spreadsheet is shown in Table 1 with four different soft red winter wheat varieties for a 500-acre farm. Notice that seed costs per acre can vary considerably depending on seed size and quality. Also note that since wheat seed is sold by the pound and seeding rates are based on a specified number of seeds per unit area, the smaller seed of equal quality is the better buy provided the same yield potential exists between the varieties being compared.

By simply changing the target population on the spreadsheet the total amount of seed and its cost for a given operation is quickly calculated…a useful feature that helps farmers select profitable target populations. To illustrate this point, the impact of different seeding rates on the total seed cost is shown for a 500-acre operation in Table 2 for a typical range of desired plant populations. In this example, a difference of 25 plants per square yard changes the total seed cost by $825. Moreover, the difference in total seed costs between timely planting and very late planting can approach $2,500 or $5 per acre!

Specific details of grain drill calibration procedures and this spreadsheet are provided in a new extension publication (AEN-81). Stop by your county extension office soon to obtain a free copy of each.

Table 1. Seeding rates for four SRW wheat lots based on the desired plant population, row spacing, and seed tag data. Total number of bags needed and seed costs are calculated for each lot.

Desired stand			
per square yard	per square foot	Row spacing in.	Plants per foot of row
350	39	**7.5**	24

Variety or lot	No. seeds per lb	Seed weight gram per 1000 seeds	Germ %	Purity %	Seeding rate		No. acres	No. 50 lb bags	Cost		
					lb per acre	gram per 200 ft of row			per bag	per seed lot	per acre
Clark	**13,765**	33.0	**90**	**99.50**	137	179	**134**	368	**$ 6.00**	$ 2,210	$ 16.49
Foster	**17,089**	26.5	**97**	**99.97**	102	133	**208**	425	**$ 7.50**	$ 3,189	$ 15.33
Justice	**16,453**	27.6	**90**	**99.00**	116	150	**47**	109	**$ 6.00**	$ 652	$ 13.87
P2552	**9,700**	46.8	**92**	**99.84**	190	247	**111**	422	**$ 13.00**	$ 5,487	$ 49.43
						Total	500	1324		$ 11,538	$ 23.08

Note: Items shown in **bold** are used to compute the desired values for each variety based on seed tag and cost data.

Table 2. Seed costs for various seeding rates with the varieties used on the 500-acre farm in Table 1.

Target Population plants/yd^2	plants/ft^2	**Total Seed Cost**
325	36	$ 10,714
350	39	$ 11,538
375	42	$ 12,362
400	44	$ 13,186

How Perfect Do Wheat Stands Need To Be?

Lloyd Murdock, Extension Soils Specialist
Jim Herbek, Extension Grain Specialist

We all want a perfect stand. It looks good and makes us feel good about our farming operation. We also believe that it is reflected in our final yield and the overall yield potential of the crop.

Stands are usually not perfect. This is especially true for no-till wheat. In fact, this is one of the reasons that producers have shied away from this practice. Many times the stand looks bad and it is felt that it would probably reduce yields.

But is this true? We have many farmers that use tramlines in their wheat and studies indicate that they do not reduce yields. The rows on each side of the tramline seem to compensate for the loss of stand in the skipped rows. If this is true, then a certain amount of stand loss in a wheat field can be tolerated. The question is how much?

In order to better understand the effects of gaps in the stand on wheat yields, two studies were

initiated this last year. In both studies, the wheat was planted using tillage. Soon after the wheat had emerged, plants were removed to make gaps that were 6, 12 or 18 inches long. The number of gaps in the study were varied to result in 5, 10 or 15% of the area of the plots skipped. One trial was located at Princeton at the West Kentucky Research and Education Center and the other was on the Joe and Henry Sanger farm in Fulton County. Two varieties (Pioneer 25R26 and Pioneer 2552) were used in Fulton and one (Pioneer 2552) at Princeton. The 25R26 variety tillers fairly prolifically while the 2552 variety is less.

The results of the experiment are found in the following table. The yields of the trials were very high, so it was a good test for this type of trial. The results were surprising. The skips had no effect in the trial at Princeton. In fact, the lowest yielding treatment was the one with no skips. So in this trial where 5 and 10% of the plants were removed in skips of 6, 12, and 18 in length, there was no effect on yield. In the trial at Fulton County, there were no differences among treatments in the 25R26 variety. The yields were the same, even when the area skipped was as high as 15% regardless of the size of the gap. There were differences with the 2552 variety. When 15% of the area was skipped, the yields were reduced regardless of the size of the gap (12 or 18 inches).

Area Skipped %	Length of Gap (in)	Wheat Yield (Bu/ac) Pioneer 25R26	Pioneer 2552
Fulton Co			
0	0	110.3 a*	107.0 ab
5	12	109.0 a	102.3 bc
10	12	104.5 a	108.0 a
15	12	109.1 a	100.6 c
10	18	108.0 a	107.5 ab
15	18	105.8 a	100.6 c
Princeton			
0	0	-	107.5 b
5	6	-	111.5 ab
10	6	-	108.5 ab
5	12	-	113.0 a
10	12	-	110.9 ab
5	18	-	108.3 ab

*Letters followed by the same letter in individual columns indicate no true differences according to a statistical analysis.

Summary

These results only represent one year of results and the study will continue for several years. However, at this time, it certainly appears that wheat stands do not have to be near perfect for high yields. Skips in the stand that comprise as much as 10% of the area will still produce stands of over 100 bu/acre and produce as well as a stand with no skips.

Effect of Percentage of Area Skipped and the Size of Gaps on Wheat Yields

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