

## Carroll, Harrison and Jefferson Counties Agriculture Newsletter



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## How Much Corn Will You Plant This Spring?

Corn prices are causing many farmers to reconsider how many acres of corn they intend to plant this spring. USDA planting intention surveys indicate that Ohio farmers report that they intend to plant a half-million more acres of corn this spring (3.6 million acres). Corn growers throughout the US report that they intend to plant 11 million more acres of corn this year than they did last year (90.5 million acres).

Much of this additional acreage may be planted in fields following corn. Planting continuous corn, even just for two consecutive seasons presents several management challenges. This newsletter contains lots of information about how you can cope with these challenges if you intend to plant corn following corn.

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## Spring Graded Feeder Sale Cancelled

Due to unforeseen circumstances related to the impending sale of the Scio Livestock Auction, the Tri-County Feeder Cattle Association Board is reluctantly cancelling the Spring Graded Feed Cattle Sale, which had been scheduled for April 18, 2007. The board regrets any inconvenience this action may cause. The new owner/manager of the Scio Livestock Auction has committed to working with the Tri-County Feeder Cattle Association to continue the graded sales in the future, and has worked with the board to schedule a new early-season graded feeder sale for:

**September 5, 2007**

This new sale is in addition to the two regular fall graded feeder sales:

**October 3, 2007  
October 17, 2007**

Details about these three sales will be available later this summer.

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## Key Steps for Managing the Risks of Continuous Corn

Given the potential for greater economic returns, many grain farmers are planning to increase their corn acreage in 2007. Although much of this additional corn will be produced in fields following soybean or wheat, some will be produced in fields following corn. Continuous corn is not recommended by most agronomists. In Ohio, corn grown following soybeans typically yields about 10% more than continuous corn. Benefits to growing corn in rotation with soybean include less disease and insect buildup, less crop residue, and less nitrogen fertilizer use. Growers who intend to plant second year corn should consider management practices that will minimize potential yield losses. The following are some key steps for managing risks of corn following corn.

1. Plant corn on the most fertile, well drained soils to reduce stress and maximize yield potential. Avoid droughty soils as well as poorly drained soil conditions.

Studies across the Corn Belt have shown that the yield differential between continuous corn and corn grown in rotation with soybeans is greatest when yield potential is low. This yield advantage to growing corn following soybean is especially pronounced when drought occurs during the growing season. In a study conducted in Minnesota, the yield advantage to an annual rotation of corn and soybean compared with monoculture was frequently greater than 25% in low yielding environments.

2. Plant Bt rootworm resistant corn hybrids or apply soil insecticides in areas where western corn rootworm problems have occurred. Bt corn requires a 20% refuge planted to non-Bt corn to prevent resistance development. Corn rootworm problems on refuge acres may be managed with soil-applied insecticides, or high rate formulations of seed treatments.

3. Adjust nitrogen rates. Optimum nitrogen rates for corn after corn are generally higher than those for corn after soybean and the additional nitrogen required ranges from 30 to 50 lbs nitrogen/ A.

4. Select hybrids that have demonstrated high yield potential across diverse environments and stress conditions. Only hybrids with above average ratings for drought tolerance, stalk strength, and emergence under stress conditions (low temperatures and cold, wet soils) should be considered. Select corn hybrids with resistance to gray leaf spot, northern corn leaf blight, anthracnose and gibberella stalk rots, and diplodia ear rot. The severity of these disease problems is much greater in reduced tillage systems where residues are present. In the past, the use of foliar fungicides has not been considered economical for disease control in field corn regardless of the rotation followed. Strobilurin fungicides have received much attention recently but university data on their efficacy is limited.

5. Develop strategies for dealing with increased crop residues. Use stalk choppers and knife rolls on combine heads, spread trash uniformly during harvest, consider strip tillage, avoid no-till where practical, avoid no-till planting on top of old rows, use row cleaners and seed firmers, and plant hybrids with good disease resistance, emergence, and seedling vigor.

Studies in Ohio and Indiana have shown that increasing the amount of tillage from no-till to chisel to moldboard plow decreases the yield difference between continuous corn and corn rotated with soybean, especially on poor drained soils. No-till cropping systems are more likely to succeed on poorly drained soils if corn follows soybean rather than corn. The influence of crop rotation on corn response to tillage and soil type has been well documented in long-term OSU-OARDC studies. On poorly drained Hoytville silty clay soils in NW Ohio, where corn followed soybean, yield differences between no-till and tilled ground were greatly reduced. Crop rotation with soybeans had much less effect on corn response to tillage on well-drained Wooster silt loam soils in NE Ohio

Source: CORN 07-03

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## Continuous Corn – Be Ready to Pay for More Nitrogen

Higher corn prices may be enough to convince some producers to increase their corn after corn acres, but be aware that your nitrogen fertility bill has to go up compared to corn after soybeans. One of the primary benefits of growing corn after soybean is the decreased demand for supplemental nitrogen fertilizer. The difference in corn nitrogen demand following another grass crop (compared to a legume) has been known for some time and is usually reflected in nitrogen recommendations. The “credit” for a prior soybean crop ranges between 30 and 40 pounds of nitrogen per

acre. The reason for the decreased need for supplemental nitrogen fertilizer is not fully understood, but research suggests that it is due to the nature and amount of crop residue returned to the soil. Far less residue is returned to the soil following a soybean crop and the nature of the residue is much different. The carbon:nitrogen (C:N) ratio of soybean residue generally ranges between 30-40:1 while corn residue generally ranges between 80-90:1. The increased C:N ratio and total amount of residue returned from the corn crop causes a slow and sizable immobilization of soil nitrogen to satisfy microbial demand so that the residue can be broken down. Soybean residue too requires immobilization, but the immobilization proceeds more rapidly and nitrogen demand by microbes is not as great. Once the residue has been broken down, the new equilibrium that is reached results in net mineralization of organic nitrogen (from the recently added residue) decreasing the need for supplemental nitrogen fertilizer.

Data collected in Ohio from 47 corn after soybean sites and 21 corn after corn/wheat sites show the average difference in the agronomic optimum nitrogen rate of 31 pounds per acre. Bottomline – corn after corn requires more supplemental fertilizer than corn after soybeans. Economic nitrogen recommendations, available online, take into account these differences between corn after corn and corn after soybeans, so the credit is actually built into the recommendation (the credit does not have to be subtracted – it is already done) (recommendations available at <http://agcrops.osu.edu/fertility/>). Be prepared to pay for more nitrogen if you choose to grow more corn after corn.

Source: Corn 07-04

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## Continuous Corn: It's Effect on Diseases

In recent years, Ohio corn growers have not had to deal with major disease problems. With the exception of a few localized stalk rot, ear mold, and leaf blight problems, growers have suffered very little yield and quality losses due to diseases. This is largely because most growers practice crop rotation and plant hybrids that are resistant to major diseases. However, this situation will likely change completely over the next few years if Ohio's growers switch to continuous corn. Most of our main corn disease problems are associated with conservation tillage and continuous corn cropping practices. Major, potentially yield-limiting foliar diseases such as gray leaf spot, northern corn leaf blight, anthracnose leaf blight, and eye spot are generally more problematic in continuous corn production systems. In addition, stalk and ear rots are very common in this type of cropping system.

Economically important foliar, ear, and stalk diseases such as gray leaf spot (*Cercospora zeae-maydis*), northern corn leaf blight (*Exserohilum turcicum*), eyespot (*Kabatiella zeae*), anthracnose leaf blight and stalk rot (*Colletotrichum graminicola*), *Gibberella* ear and stalk rots (*Gibberella zeae*), and *Diplodia* ear and stalk rots (*Stenocarpella maydis*) are caused by pathogens that survive the winter in crop residue left on the soil surface. Once conditions become favorable (warm and humid) in the spring, these fungi grow and produce spores that are wind-blown or splashed onto the leaves, stalks and ears of the new crop, causing new infections. Although each disease may occur separately and develops best under a separate set of weather conditions, damage caused by one disease may increase problems associated with another. For instance, extensive blighting of the upper leaves due to gray leaf spot and northern corn leaf blight may lead to stalk and ear rot problems. Leaves in the middle and upper parts of the plant produce most of the sugars (about 75%) needed for grain production, so, a reduction in healthy leaf area means that less sugar, and as a result, less grain will be produced. To compensate for low sugar production by the leaves, sugars are removed from the stalk, leading to poor stalk quality, stalk rots, and lodging. Compound losses (direct and indirect) due to gray leaf spot, for example, may be as high as 90% in susceptible hybrids under favorable weather conditions.

Crop rotation and tillage are two of the most effective management strategies for reducing losses due to all of the diseases mentioned above. Both practices lead to destruction of crop residue, reducing survival of pathogens from one year to another. Planting a non host crop such as soybeans breaks the cycle of most corn pathogens, since they depend largely on corn or some other related host to complete their live cycle. However, in a continuous corn cropping system, especially when reduced tillage or no tillage is practiced, pathogens are carried over from one growing season to another, eventually building up to levels likely to cause grain yield and quality losses. Although planting a resistant hybrid or using a fungicide may reduce losses due to diseases in a conservation tillage-continuous corn cropping system, no hybrid is equally resistant to and no fungicide is equally effective against all the diseases likely to develop in such a system.

Growers willing to plant corn after corn will have to be prepared to use multiple management strategies to minimize disease problems.

1. Use some form of tillage to bury crop residue. Without crop rotation, tillage becomes absolutely necessary to reduce pathogen buildup from one season to another.
2. Plant hybrids with good disease resistant and tolerance. Some hybrids are more tolerant than others, meaning that for a given level of disease, the more tolerant hybrids will suffer less yield reduction than the less tolerant hybrids.
3. Use fungicides to control foliar diseases when susceptible hybrids are planted and weather conditions are favorable.
4. Select hybrids with good standability and stalk strength.
5. Use adequate fertility programs based on soil tests and avoid excessive rates of nitrogen or other nutrients.
6. Control insect pests and weeds. Aphids and leafhoppers may transmit viruses to corn from weeds. In addition, root worms and stalk borer may cause injuries to plant roots and stalks, permitting stalk rot fungi to enter the plant.

Source: CORN 07-04

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## Weed Management Issues in Continuous Corn

The continuous planting of summer annual crops in Ohio tends to make weed control more difficult, since it promotes the continuous selection for weed species that are most successful in this cropping system. Within this summer annual cropping system, planting a monoculture of corn or soybeans can result in greater weed problems over the long term, due to the propensity for overuse of certain herbicides (atrazine in continuous corn, for example, or glyphosate in continuous Roundup Ready soybeans). Rotation of crops has historically resulted in greater diversity in herbicide use. As a result, a weed that was not well controlled by herbicides in one crop might be effectively controlled with different herbicides in the next year's crop. This is changing due to the increase in Roundup Ready corn and therefore continuous Roundup Ready acres, which will most likely result in over-reliance on glyphosate and correspondingly less herbicide diversity.

We are not convinced that the planting of continuous corn really poses more serious issues for weed management, compared with a rotation of corn and soybeans, as long as appropriate weed management strategies are used. We have many effective herbicides for use in corn. The question is – will we integrate them to most effectively manage the really tough weeds and minimize selection for herbicide

resistance? Some considerations for weed management in continuous corn follow, with special emphasis on Roundup Ready corn.

- Use tillage or preplant burndown herbicides to ensure that corn is planted into a weed-free seedbed. Planting soybeans into weedy fields, and delaying the first glyphosate application until sometime after soybeans emerge contributed to the development of glyphosate resistance in giant ragweed and marehail, and also the general increase in winter annual weeds and dandelions.

- Select a herbicide program that is appropriate for the weeds in the field. A total preemergence herbicide program can control many annual weeds, but frequently fails to provide season-long control of weeds that can emerge in mid-season, such as dense annual grass infestations, giant ragweed, burcucumber, and perennial weeds. A combination of preemergence and postemergence herbicide applications is more effective for these type of weeds, and in any field with a history of poor weed control.

- Use a diversity of herbicide sites of action within and over years, to reduce the risk of herbicide resistance. This will be more easily accomplished where a combination of preemergence and postemergence herbicides are used, compared with a total preemergence or total postemergence approach. Triazine resistance developed in continuous corn in the 1970's due to over-reliance on atrazine. Avoid using atrazine as the sole broadleaf herbicide in continuous corn, and avoid continuous use of ALS inhibitors for control of the same weeds every year.

- We assume that glyphosate will be a primary component of herbicide programs in continuous Roundup Ready corn, but other herbicides should be used along with glyphosate to reduce the selection for glyphosate resistance. Examples: 1) Apply preemergence herbicides at the time of planting to reduce the weed population that will need to be controlled with postemergence glyphosate applications; 2) In a tilled field where a total postemergence program is planned, mix glyphosate with other herbicides that can help control emerged weeds and provide residual weed control (which essentially eliminates the need for a second postemergence application); and 3) where glyphosate is applied late postemergence following preemergence herbicides, mix it with low rates of other postemergence herbicides (Status, Callisto, or Resolve, for example).

- Manage postemergence glyphosate applications appropriately. Apply when weeds are small. Increase the glyphosate rate in any sub-optimum weed control situation, such as large weeds, or weeds that are developing a history of control problems (lambquarters, giant ragweed, morningglory, pokeweed).

- Corn hybrids that have the BT Herculex trait are also Liberty Link (resistant to Liberty). This includes stacked trait hybrids that have a combination of glyphosate resistance and the BT Herculex trait (Pioneer, Dow, and Syngenta hybrids, among others). Consider using Liberty in postemergence applications to these hybrids, instead of glyphosate. There is about a \$6 per acre difference in cost between glyphosate and Liberty (with current rebates), but use of Liberty breaks the cycle of continuous glyphosate use, and this can have long-term benefits. Growers with a history of giant ragweed control problems with glyphosate should strongly consider use of Liberty on hybrids that carry the Liberty Link trait.

- Some consideration should be given to the type of corn that is used each year in a continuous corn system for several different reasons. From a herbicide use standpoint, growers have a choice of: conventional hybrids (cannot be treated postemergence with glyphosate or Liberty); glyphosate-resistant hybrids such as Roundup Ready or GT Agrisure (can be treated postemergence with glyphosate but not Liberty); Liberty Link hybrids (can be treated postemergence with Liberty but not glyphosate); stacked-trait hybrids that contain both the glyphosate resistance trait and the Liberty Link trait (can be treated postemergence with glyphosate or Liberty). Rotation of these types of corn from year to year, and corresponding rotation of herbicides, should reduce the risk of resistance to glyphosate and other herbicides. Beyond this, there is the issue of volunteer corn (see next bullet).

- One of the more insightful questions we received from growers at winter meetings this year involved the potential problems controlling volunteer corn in continuous cornfields, since the volunteer corn could be herbicide-resistant. For example, planting continuous Roundup Ready corn would result in the possibility of volunteer Roundup Ready corn in next year's corn. Postemergence applications of glyphosate would fail to control the volunteer corn, which would then be a weed problem. In a rotation consisting of two years of corn followed by a year of soybeans, this problem could largely be avoided by planting conventional corn the first year, and Roundup Ready corn the second year. This would allow use of glyphosate in the second year of corn to control the volunteer corn. Alternatively, Roundup Ready corn could be planted the first year, and a hybrid containing the Liberty Link trait (BT Herculex or stack of BT Herculex plus Roundup Ready) in the second year. Liberty could then be applied postemergence in the second year of corn, and would control or at least greatly injure the volunteer Roundup Ready corn. Infestations of volunteer corn vary considerably from year to year, based on the stalk lodging and weather during the previous year's harvest season. We can't predict how significant the issue of volunteer corn will become in continuous corn, but some thought should be given to the rotation of corn hybrid types to minimize the risk of control problems.

Source: CORN 07-04

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## Increasing Your Corn Acres with Corn Following Corn? Do Not Forget About the Insects!

With many growers planning an increase in their corn acreage by planting corn following corn, the possibility of increased pressure across Ohio from western and northern corn rootworms is higher. With the exception of the western corn rootworm variant that lays its eggs in soybean fields, now causing concerns in western Ohio, adult rootworms normally lay their eggs in corn fields in August, with larvae hatching the following year and feeding on corn roots if present. The age-old way to manage this problem has always been, and continues to be in most of Ohio, rotation to another crop. Most growers in Ohio have not had to worry about rootworms because of crop rotation.

However, with many growers planning on corn following corn, the need to protect corn from rootworms this coming summer is greater. Growers should remember that there are numerous tactics they can use to combat this insect. Soil insecticides continue to be excellent choices (see list of currently labeled insecticides at: <http://entomology.osu.edu/ag/545/cicrwl.pdf>). They are effective and give good, consistent control. Transgenic corn hybrids containing the RW or rootworm gene are excellent choices, whether alone or in stacked hybrids containing the genes for corn borer control or Roundup Ready resistance. When using transgenic hybrids, first base your hybrid selection on hybrids that have superior agronomic traits for your growing area. Also, remember that if transgenic corn hybrids are planted, a 20% refuge area of non-transgenic hybrids is required. Check with your seed supplier for details on the refuge area. The final choices for rootworm management are the higher rates of seed treatments, Cruiser 1250 or Poncho 1250. Although data from Ohio and other Midwestern states have shown that these seed treatments do NOT manage rootworms well under high rootworm feeding pressure, they do give adequate control if rootworm populations are low to moderate. Thus, they should give good rootworm control in many fields in Ohio. We would suggest that you consider using seed treatments in those areas where rootworms have not been a problem in the past.

Although rootworms are the main insect of concern with corn following corn, we always get asked about the potential for other insect pests that might increase. Actually, other corn pests should not become either greater or lesser problems.

Insects such as black cutworms and armyworms migrate from southern states, and thus, whether corn follows corn or soybeans is immaterial. The primary concern with these two insects is whether fields are weedy or have a grass cover crop, which attract these insects. Most other insects, although overwintering in nearby areas, also come into the field each spring from outside the field. This situation also pertains to European corn borer. Although they overwinter in corn fields, adult moths move in and out of corn on a daily basis, so having been in corn the previous year will not be great concern. Although slugs will continue to remain in a field, they can cause problems in whatever crop is grown the coming year, whether corn or soybean.

Thus, except for the western and northern corn rootworms, corn following corn should not increase or decrease the level of insect pests. However, rootworms are the one insect pest that probably need controlling when corn follows corn. For other problems, we continue to recommend scouting and treating when necessary.

Source: CORN 07-04

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## Pesticide Certification Testing Schedule

Farmers wishing to become licensed Private Pesticide Applicators can take the test at a testing session scheduled for Wednesday, April 11, 2007 from 12 Noon to 4 PM at the Jefferson County JVS, 1509 County Road 22-A, Bloomingdale. Farmers who are currently licensed Private Pesticide Applicators can also attend this session to take a test to add extra categories to their licenses.

There is no fee to take the tests, but you must pre-register either online or by telephone. To register online go to [www.ohioagriculture.gov/pesticides](http://www.ohioagriculture.gov/pesticides). Scroll down to the Private Applicator section and click on #3, Exam Locations. Then scroll down to April 11 and click on Jefferson County and follow the registration directions.

To register by phone, contact the Ohio Department of Agriculture at 800-282-1955, ext. 31.

There will not be any training for the Private Pesticide Applicators on April 11, but study materials to prepare for the test can be purchased at your local Extension office.

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## Understanding Neonatal Calf Diarrhea

Neonatal calf diarrhea or CALF SCOURS generally is caused by one or more of the following disease organisms: Rota virus, Corona virus, Cryptosporidium parvum, E. coli (K99 enterotoxigenic form), or Salmonella. Understanding the impact that these disease entities have on baby calves can help cow calf managers reduce the adverse effects of calf scours. Adequate colostrum intake by the calf is important for disease protection. A vigorous baby calf nursing a properly immunized, properly fed dam, will be a first line of protection against calf scours.

The first 3 organisms on the above list usually cause diarrhea at 7 to 21 days of age, while the common E. coli strains cause diarrhea within the first few days of life. The E Coli bacteria attaches to cells in the lining of the gut and turn on the fluid pump mechanism to cause excess water secretion into the gut. (Enterotoxigenic scours. Cow vaccination is helpful with this form.) The viral scours are caused by decreased absorption of water from the gut as the virus kills the cells of the gut papilla. (Cow vaccination is available but not always effective). Cryptosporidium and salmonella are

zoonotic (transferable to humans) problems. The diarrhea is the result of a combination of factors including: (1) dose (number) of organisms the calf is exposed to, (2) amount or lack of calf immunity (colostrum), and (3) stress on the calf. When should I treat the calf? Calves running around the pasture with their tails in the air, bucking and kicking with yellow or white diarrhea may not need treatment. The main indications for treatment are (1) general disposition, (2) appetite, (3) dehydration, and (4) body temperature. If the calf is weak, depressed, or reluctant to move these are all indications that something is wrong. If the calf is not eating, the cow's udder will be distended and this is sign of trouble also. Dehydration can be evaluated easily by pulling up the skin on the side of the neck or shoulder. In a normal calf, the skin snaps back into position quickly. In a dehydrated calf, the skin remains "tented" for a period of time-the longer it remains "tented" the worse the dehydration. Also, as dehydration worsens, the eyeballs sink back away from the eyelids-this is a bad sign and fluids are indicated immediately. Normal body temperature (measured with a rectal thermometer) is 100.5° F to 102.5 ° F. Body temperatures less than 100 ° F and greater than 102.5 ° F is a sign of problems and treatment should be started.

What are the recommended treatments? The main treatment is fluid therapy. Secondary treatments are antibiotics and nursing care. Because the main problem in scouring calves is loss of body fluid and electrolytes, the primary treatment must be aimed at restoring the water balance. The calves are thirsty, but they are too sick to drink. Therefore, the first line of treatment is oral electrolyte solutions. There are a number of excellent commercial products on the market for treatment of calf scours. All of these products contain glucose or a similar material, sodium chloride (table salt), and other electrolytes. The glucose and sodium allow the animal to absorb the water they need from their digestive tract. Giving straight water does not work. Usually 2 liters (just over 2 quarts) of the oral fluid solution is given 1 to 3 times per day to the sick calf. Consult with your veterinarian regarding the appropriate oral electrolyte product for your operation.

Antibiotics are often given to scouring calves even though antibiotics do not kill most of the calf scours agents. Due to damage in the gut of scouring calves, bacteria will "leak" into the blood stream of these calves and cause further problems.

Antibiotics are of value for this reason. Antibiotics may kill the normal flora bacteria in the gut and actually make the problem worse but they must be used in circulating infections. Again, consult with your veterinarian regarding the correct choice of antibiotics to give. Many of the antibiotics are not labeled for calf scours and thus require a prescription from your veterinarian and an extended withdrawal time.

When treating sick calves, always treat them after you have attended to all the normal calves. This will decrease the spread of germs from the sick calves to the younger healthy calves. Also, keep all your treatment equipment clean-including your hands and clothes, as you can easily transmit these agents.

When do I need additional help? If your treatment methods are not working, contact your veterinarian immediately for additional help. If more than 5% of your calves are scouring and require treatment, you need help. If death loss is greater than 2% due to calf scours contact your veterinarian.

Source: OSU Extension Beef Team Newsletter, March 14, 2007, Issue 528.

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