



Field Crop Advisory Team Alert

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Managing corn and soybean fields submerged by recent heavy rains

Kurt Thelen
Crop & Soil Sciences



The heavy rains have continued and what two weeks ago was isolated flooding has now progressed to cover the majority of the corn- and soybean-producing areas of the state. This problem has left growers struggling with the question of whether or not to replant water damaged stands and how to manage fields that have yet to be planted.

Assessing plant and stand viability

The first step is to determine if plants survived under water or in saturated soil. Seed that has germinated but not emerged is also susceptible to excessive water damage. In corn, most of the plant mortality will be in localized low areas of the field subjected to standing water. The survivability of plants or seedlings under water is dependant on temperature, growth stage, variety, soil type, nutrient status, and other factors but is generally in the 24 to 96 hour range. In cool temperatures, plants will survive longer as respiration slows. Conversely, when temperatures warm up, plants consume oxygen quicker, and submerged plants will not

survive as long. In cool conditions, corn can survive four days submerged. With soil temperatures warmed up in the upper 70's, submerged corn may survive for only 24 hours. Unfortunately, the warm temperatures experienced throughout much of Michigan while plants were submerged have likely increased the chances that some fields will experience significant stand loss. In soybeans, soil borne disease such as pythium and phytophthora can result in plant mortality beyond those areas under water. In assessing a soybean stand, for more fertile soils a minimum of 80,000 to 100,000 living plants per acre are needed to approach the full yield potential of the field. In poorer soils, 100,000 plants per acre are needed. In situations with less than the minimum number of plants remaining, the cost of replanting should be weighed against the expected increase in yield to determine if replanting will be economically feasible.

Generally, the time it takes for submerged soil to dry out enough to get equipment on for replanting is usually time enough to make a determination whether or not plants have survived. However, it can be difficult to determine survivability when plants are covered with soil and plant residue left behind by receding water. In these cases, split a plant lengthwise through the stem. The growing point should be relatively firm and white or cream-colored. Darkening or softening of the growing point indicates a nonviable (dead) plant. A step-by-step worksheet (MSUE

About this special excessive rain issue

As many areas of the state approach new records for the amount of precipitation in any month, MSU Extension's campus and field staff have rallied to provide you with this special issue about dealing with flooded fields. This issue is being delivered to an expanded mailing list provided by county Extension staff and funded by MSU Extension. We hope the information helps you make optimum crop decisions this spring. – Joy N. Landis, editor.

Interested in more information from MSU Extension?



If you are not currently a subscriber to the *CAT Alert* newsletter and

would like to receive the rest of our 2004 season (approximately 10 more issues), send a \$15 check made out to Michigan State University to: MSU Field Crop CAT Alert, 243 Natural Sciences Bldg, East Lansing, MI 48824. Include your name, phone number and mailing address. This is a special half season rate. —
Joy N. Landis, editor.

Bulletin E-1961) to guide producers through a replant decision is available through local MSU Extension offices.

How late into the year can I plant/replant and still expect a reasonable chance of maturing grain?

There is still time to replant drowned out corn or soybeans with varieties having appropriate maturities in Michigan. If the rains continue and field operations are delayed until the end of May, growers may want to consider planting an earlier maturing, short season hybrid. The lower half of the Lower Peninsula will on average, accumulate 2000 to 2200 GDD from June 1 to first frost. This is sufficient to mature 80- to 90-day corn and soybeans with a group II or less maturity classification. It is not recommended to plant corn after June 15. The rule of thumb most commonly applied to lost yield potential for delayed planting is one bushel per acre per day after May 10, and up to two bushels per acre per day after June 1. Soybeans can generally be planted up to the end of June, although yields will likely be reduced commensurate with the later planting date.

Considerations for replanting into existing stands

When replanting flooded-out areas with some viable plants, it is usually best to tear up the existing stand and start over with an even-emerging stand. This may require you to manage the area differently than the non-flooded parts of the field with regard to activities based on plant growth stage such as weed control and time of harvest. Other considerations in flooded-out areas include potential weed problems from weed seed brought in by encroaching waters, herbicide residue washed in from adjacent fields, loss of herbicide control from excessive leaching or erosion, loss of nitrogen through denitrification or leaching, and increased incidence of phytophthora and other root disease. Nodule function in soybeans is also reduced in saturated soil. However, nodule activity resumes to normal levels once the soil dries out. Scout fields closely for these factors and use a PSNT soil test to determine nitrogen losses.

Other considerations for late planting/replanting

Following are other considerations with late planting that I have compiled including some from Bob Nielsen at Purdue University and Jim Beuerlein at Ohio State.

- Bt corn hybrids. For most Michigan corn production systems, economic benefits from the use of transgenic Bt corn hybrids resistant to corn borers are more likely to occur with

delayed plantings, especially when there is earlier planted corn in the vicinity.

Consequently, growers may want to consider switching some of their late-planted intended non-Bt corn acreage to Bt hybrids as insurance against the higher risk of infestation by late brood corn borers.

- **Previously applied herbicides and insecticides.** Before replanting, review label restrictions associated with previously applied herbicides and insecticides. Please see the article on herbicide concerns in this issue by Jim Kells and Kathrin Shirmacher and a similar article on insecticide concerns by Christina DiFonzo for more details.

- **Seeding rates.** There is no need to consider changing seeding rates for corn simply because planting is delayed. Optimum seeding rates for most growers' fields range from 28,000 to 33,000 seeds per acre. Lower rates (low to mid-20's) are suitable for fields with yield levels historically near or below 100 bushels per acre. Unlike corn, soybean has a great propensity to compensate or "flex" when plant populations vary. Therefore, the optimal planting population range is wider for soybean than corn. Determining the minimal scale of that optimal soybean planting population range will optimize profitability and still maintain yield. As a starting point, begin with a planting population of 175,000 seeds per acre for drilled systems and 130,000 seeds per acre for 30-inch rows, and then adjust down or up from there based upon field productivity, planting date, and planting conditions. When planting late, resulting soybean plants will be smaller than earlier planted soybeans. To compensate for the potential yield decrease of smaller plants due to late planting, increase your planting population by 20 percent.

- **Seeding depth.** The key factor for determining seeding depth for corn is the importance of adequate and uniform soil moisture in the seed furrow. Some might say this is a moot point given the current soggy soil conditions. Remember, though, how quickly Mother Nature can change and how quickly shallow-placed seed can find themselves in bone-dry soil. A seeding depth of 1.5 to 2.5 inches for corn and 1.0 to 2.0 for soybean is acceptable over a range of soil conditions. Shallower depths for corn are risky if rains stop altogether and surface soils begin to dry rapidly.

- **Field tillage operations.** Remaining pre-plant field operations should be scrutinized carefully to determine whether they are necessary. With today's modern corn planters, there is little reason to overly-prepare a field to create a picture-perfect seedbed. In delayed

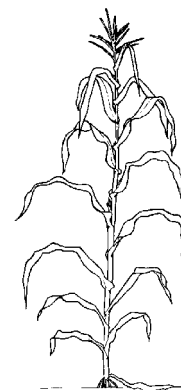
planting situations, every day wasted overworking a field is a day lost to planting and represents lost yield potential. Furthermore, unnecessary tillage operations on marginally wet soils increase the risk of creating tire and tillage compaction layers that can haunt root development and corn health later if excessively dry conditions suddenly become the norm.

- Planter sidewall compaction. Another concern to watch for is the potential for significant root restriction by severe sidewall compaction when a rapid shift from wet to dry conditions occurs. If at all possible, avoid planting fields when soil moisture conditions favor the smearing of furrow sidewalls by the coulters or double-disc openers of the planter. The potential yield loss from planting in fields too wet far outweighs the potential yield loss from delaying planting until field conditions are suitable. Please see the article by Carrie Laboski and myself in this issue for more information on seed furrow sidewall compaction.
- Nitrogen fertilizer applications. Because the recent flooding will likely delay planting until the end of May or early June, growers may want to consider backing off on their intended nitrogen fertilizer application rates due to the expected lower yield of the late-

planted corn. Details on nitrogen management strategies for flooded soils can be found in Carrie Laboski and Darryl Warncke's article in this issue. The rule of thumb most commonly applied to lost yield potential for delayed planting is one bushel per acre per day after May 10, and up to two bushels per acre per day after June 1. Consider using a **pre-sidedress soil nitrate test** to further fine-tune your nitrogen application rates.

- Starter fertilizer. Where soil phosphorus and potassium soil test levels are adequate or better and tillage is other than pure no-till, consider eliminating starter fertilizer use for the remainder of this season's corn planting. Soil temperatures at planting from here on (should) be more than adequate for rapid corn germination and early seedling growth, thus greatly diminishing the value of starter fertilizer. Eliminating starter fertilizer will not only reduce your costs, but will save some time during the planting operation. No-till corn, however, will likely continue to benefit from starter fertilizer applications, especially the nitrogen component, for planting throughout the remainder of the month. However, growers may want to consider applying some of the corn nitrogen requirement at planting. **IPM**

Information on calculating the most cost effective nitrogen rate can be found on my website at: <http://www.msu.edu/~thelenk3/>. Hit the "calculate optimum nitrogen rate for corn" hot button located in the Extension and Outreach section.



Because of wet conditions this spring, many newly seeded alfalfa fields may show poor growth in wet or slowly drained fields, which may be due to several diseases. Seedling diseases should be suspected when emergence is poor or there are stunted, discolored, or dead seedlings.

Aphanomyces root rot can cause death and stunting of seedlings as well as more subtle disease of established plants that can result in significant yield reduction. Other diseases that occur in wet or poorly drained soils include *Phytophthora* root rot and *Pythium* seed and root rot.

Plants infected with *Aphanomyces* usually become stunted and chlorotic (yellow) before they wilt and die, whereas *Phytophthora* and *Pythium* tend to kill seedlings quickly before plants become severely chlorotic. Another clue to a problem with *Aphanomyces* is root rot of an alfalfa cultivar that is highly resistant to *Phytophthora*.

Although not much is known about *Aphanomyces* root rot in Michigan, it is known to be a serious problem in nearby states including Wisconsin, Indiana, and Iowa. We suspect this disease is also a problem in some Michigan fields. This disease is caused by the soil-borne fungal-like pathogen *Aphanomyces euteiches*. Perhaps because alfalfa disease that occurred in wet

soil was attributed to *Phytophthora*, *Aphanomyces* root rot of alfalfa was not recognized as a serious problem until the early 1980s.

Aphanomyces root rot is best managed by avoiding poorly drained soils and using *Aphanomyces*-resistant alfalfa varieties. However, this year, even well drained fields have been water saturated due to abnormally high rainfall in May. Fungicides are not available for control of *Aphanomyces* root rot of alfalfa. *Phytophthora* and *Pythium* root rots of seedlings can be controlled with fungicidal seed treatments, such as Allegiance-FL, ApronXL, or Apron-FL, but these seed treatments are not effective against *Aphanomyces*.

Alfalfa varieties rated highly resistant (HR) or resistant (R) to *Aphanomyces* root rot should be planted where slowly drained soils occur and where *Aphanomyces* may be a problem.

Click on the Extension bar and then the Perennial Forage Legume and Grass Varieties for Michigan. Control of *Aphanomyces* root rot became more challenging when different races of this pathogen were discovered. Many commercial alfalfa cultivars are now available that have resistance to race 1, the first race discovered. Another race (race 2) of *Aphanomyces* was identified in the early 1990s that overcomes race 1 resistance. Alfalfa cultivars developed for resistance to race 1 are killed by the aggressive race 2 isolates. Race 2

Aphanomyces on alfalfa

Rich Leep and Do-Hong Min
Crops & Soil Sciences

A list of varieties and their disease resistance can be found at the MSU Forage Information Systems web site at: <http://www.msue.msu.edu/fis/>

For a photo of *Aphanomyces* symptoms on alfalfa, please look at the following web site. <http://www.ent.iastate.edu/imagegal/plantpath/alfalfa/aphanomyces/0093.7aphansymp.html>

For more information on forage crops, see *An evaluation of annual crops planted for emergency forage* in this issue of the CAT Alert.

isolates have been identified in a number of states including Wisconsin, Iowa, and Kentucky. Race 2 has not yet been confirmed in Michigan. Alfalfa varieties with resistance only to race 1 may be genetically vulnerable to *Aphanomyces* root rot in many regions due to the presence of race 2. Several commercial alfalfa varieties are now available that have resistance to both races of *Aphanomyces*. If resistance to race 2 is not specified for an *Aphanomyces*-resistant alfalfa cultivar, then you can assume it is resistant only to race 1. The overall distribution and impact of races 1 and 2 of *Aphanomyces* are uncertain, but *Aphano-*

myces root rot should be considered as a potential problem in many parts of Michigan.

If you have an alfalfa seeding that has failed this spring, it should be safe to replant with alfalfa again this year since compounds that cause autotoxicity do not accumulate in seedlings. A *Phytophthora*- and *Aphanomyces*-resistant varieties (treated with Apron XL) are recommended for replanting failed seedings. However, timing is a factor because alfalfa seedings done too late in the spring may fail because of inadequate moisture. If this occurs, one may wait until late summer for re-seeding alfalfa fields. **IPM**

Corn contracted for fall delivery but not yet planted

Roger Betz
MSU District Extension Farm
Management Agent

With the wet weather, many producers may think they are trapped because of having corn contracted for fall delivery, but they don't have it planted and they want to switch to soybeans.

Producers in this situation need to review their options and the risk management tools in place. First review "How many bushels per planted acre are contracted?" As of May 23, in Michigan 71 percent of the corn and only 36 percent of the soybean crop was planted. (Higher numbers were planted to the south and lower numbers were planted to the north and east.)

Some crop insurance policies (CAT, Multi Peril, CRC and RA) have a "prevented planting" provision that will provide revenue from the prevented planting. June 5 is the corn planting deadline (June 15 soybeans) for full crop insurance coverage. However, there is a late planting option where the coverage level is reduced 1 percent per day (up to 25 days) past the planting deadline. The producer must notify the insurance agent within 72 hours if the decision is to not plant. If planted, the yield realized will be used in future established payment yields.

Evaluate your decision carefully as the payout on prevented planting may or may not be more attractive than the projected return over variable cost from late planted corn or soybeans. The "Prevented Planting" payment is 60 percent of the bushel guarantee (Established Yield X Coverage Level) times a price of \$2.45 for Multi Peril, or \$2.83 for CRC and RA policies. Direct Payments and potential Counter Cyclical payments are not effected by prevented planting. Call your insurance agent before the crop planting deadline to get the particulars of your options.

If you have contracts for fall delivery and

you don't think you will be able to deliver on all the bushels, then you need to consider your options. There are many.

Depending on the established forward contract price you may be in good position as prices have recently declined. Most grain buyers will work with you to either delay the delivery and roll the equity (or loss) into future bushels even if next year. They may be able to roll the position into a different commodity. For example, say you have 10,000 bu of corn contracted at 2.85 but you can't deliver. Suppose the current bid for fall delivery is \$2.65. You are on the "good side" with the position and have \$0.20 per bu or \$2,000 "equity." The grain buyer may be able to roll the \$2,000 "equity" into a soybean contract. With 5,000 bu soybeans this would be \$0.40 per bu added to the soybean price above the current future price. Another possibility is to use the "equity" to buy a put. If you get the crop planted, the put would provide downside protection if prices continue to fall. If you don't grow the crop and prices go up, you would simply lose value in the put. If prices go down, you could still gain on the put even though you didn't grow the crop.

Grain buyers will be very reluctant to just cancel the contact and give you the \$2,000. A simple cancel of the contract will probably have a \$.10 charge, or in our example, you would only get \$1,000. You are probably better off to roll the contract to next year or, if available, to another crop. The most important point is to contact and talk with your grain buyer early. They want your business, and if you work with them early, they will do their best to give you the best value for your market position. **IPM**



Other articles to consider when dealing with heavy rains

Considerations for replanting other crops after sugar beets in the May 13 issue of the *CAT Alert* and *Importance of timely burndown applications in no-till soybean* in the May 20 issue of the *CAT Alert* should both be reviewed because of the heavy rains.

These articles and others related to spring conditions can be found through the calendar or search button located on the IPM Program website at: <http://www.ipm.msu.edu/fieldCAT.htm> **IPM**

The excessive rainfall over much of the state has raised concerns about soil-applied herbicides. The concerns relate to weed control and corn injury.

Weed control

We have received much more rain than is ideal for herbicide activity. This increases the risk of reduced weed control due to herbicide dilution in the soil, especially on coarse textured (sandy) soils. My experience has been that weed control with soil-applied herbicides on medium or fine textured soils is usually adequate, even following heavy rainfall. On coarse-textured soils, weed control is less predictable but is often surprisingly good. It is important to monitor fields closely

The persistent, heavy storm systems that have passed through most of the state left many fields at least partially flooded. A likely consequence to this relentless wet weather is damage to earlier planted stands. This problem has left growers with the need to replant portions of fields. When replanting fields, herbicides applied previously this spring must be considered in the decision.

If cornfields will be replanted to corn, most soil-applied herbicides present no problems for replanting (Table 1). However, replanting corn in fields treated with pendimethalin (Prowl or Pendimax) is risky, as the herbicide cannot be mechanically incorporated due to the risk of severe corn injury. In this situation, risk of corn injury can be minimized by replanting without reworking the field and with as little soil disturbance at planting as possible. Furthermore, the corn seed should be planted deep (usually two inches) to get the seed below the herbicide.

The option of replanting cornfields to soybeans depends on herbicides applied previously this spring to the corn. Many of the preemergence herbicides on corn are also used in soybeans, and therefore, do not present a problem for switching the field to soybeans (Table 1). The field **cannot** be replanted to soybeans this year if atrazine or any premix containing atrazine has been applied to the field. Even with the heavy rainfall the past

With the recent heavy rains across most of Michigan, many growers and custom applicators will be faced with weedy cornfields where the corn or weeds are past the recommended application window for herbicide application. This is not an ideal situation, but several options still exist. With herbicide use, there are two strategies that can

and follow up with a postemergence herbicide or cultivation, if needed.

Corn injury

With most soil-applied corn herbicides, risk of herbicide injury to corn is low, even with excessive rainfall. One exception is pendimethalin (Prowl, Prowl H O, or Pendimax). On coarse-textured soils with low organic matter, the risk of corn injury increases with heavy rainfall. On these soils, rainfall can move the herbicide into the root zone and cause corn injury. The symptoms are short roots, swollen at the tip. This type of injury can reduce yield and lead to corn lodging. Pendimethalin is not recommended on sandy soil with less than 1.5 % organic matter to minimize this risk. **IPM**

several weeks, the risk of soybean injury from atrazine is high.

Where fields will be replanted to either corn or soybeans and a soil-applied herbicide has been applied, we recommend that **no additional** soil-applied herbicide be used. The best strategy is to monitor the fields and use postemergence herbicides or cultivation to control weeds after emergence, if needed. **IPM**

Excessive rain and soil-applied corn herbicides

Jim Kells
Crop & Soil Sciences

Herbicide considerations when replanting flooded corn

Kathrin Schirmacher and
Jim Kells
Crop & Soil Science

Table 1. Replant options with soil-applied corn herbicides.

Herbicides	Replant option
Lasso, Micro-Tech	Corn, soybeans, dry edible beans, sorghum**
Dual Magnum,	Corn, soybeans, dry edible beans,
Dual II Magnum, Cinch	sorghum**
Stalwart C	Corn
Outlook	Corn, soybeans, dry edible beans, sorghum**
Harness, Surpass, Volley,	Corn
TopNotch, Degree	
Prowl, Pendimethalin,	Corn, soybeans
Prowl H ₂ O*	
Axiom	Corn, soybeans
Define	Corn, soybeans
atrazine	Corn, sorghum
Princep	Corn
Python WDG	Corn, soybeans
Hornet WDG	Corn
Callisto	Corn

*Replanting corn should be done **without tilling** and planting the seed at least 2 in. deep.
**Sorghum seed needs to be properly treated with an approved herbicide safener or severe injury may occur. See herbicide label for details.

be followed: (1) broadcast application and (2) directed application. If the weed population is low to moderate, cultivation may be the most economical option. With high weed populations, cultivation may also be needed following herbicide applications to control the weeds that the herbicide misses.

Postemergence herbicide application to large corn and weeds

Jim Kells and
Kathrin Schirmacher
Crop & Soil Sciences

Saturation of the soil by continual and excessive rainfall is causing significant loss of nitrogen from the soil. Plants that survive the standing water and saturated soil conditions will have little nitrogen available for them to use. Much of the nitrogen has been lost by either leaching or denitrification. Nitrate is the form of nitrogen vulnerable to these losses.

Leaching

As the first rainfall events saturated the soil, significant amounts of water moved downward through the soil and carried nitrate-nitrogen with it. For each inch of water moving through the soil, nitrate may have moved three inches in finer-textured soils to more than six inches in sandy soils. However, the nitrate is not completely swept downward with the leaching water. Some nitrate is held with the water in soil aggregates. In sandy soils, nitrate leaching will be more significant than in loams and clayey soils.

Denitrification

Denitrification of nitrate (reduction to gaseous nitrous oxides) is the major mechanism for nitrogen loss in saturated warm soils, especially for finer-textured soils. Denitrification loss may range from 5 to 15 pounds N per day, depending on soil temperature. Where soils have been flooded or completely saturated for more than four continuous days, little available nitrogen will remain in the surface soil. A source of organic carbon is needed for microorganisms to denitrify nitrate. Hence, nitrate leached into the subsoil will not be denitrified to the same degree as nitrate in the surface soil. As the soil dries out, some of this subsurface nitrate will move toward the surface and into the root zone.

So how much nitrogen might remain in your soil? Well, that answer depends on when you applied the nitrogen. For applications prior to May 10, there has been sufficient time and warm enough temperatures for much of that nitrogen to be converted into nitrate and lost, regardless of the form of nitrogen applied. For applications of anhydrous ammonia, 28 percent N (urea ammonium nitrate), urea, or ammonium sulfate after May 10, some of the nitrogen will still be in the ammonium form and remain available to the crop.

Some conversion (mineralization) of soil organic nitrogen to ammonium and then nitrate will have occurred thus far this season. However, the greatest amount of organic matter mineralization will occur during the month of June. This means that the soil's ability to supply nitrogen to your crops may be somewhat reduced but not eliminated.

The best way to determine how much available nitrogen remains in the soil as it dries out is to collect samples and have them analyzed by a soil testing lab. For a typical pre-sidedress nitrate test (PSNT), collect 15 to 20 soil cores to a depth of 12 inches from representative field areas. Because some available nitrogen may remain in the subsurface soil, collect an additional sample from the 12 to 24 inch depth. In fields where anhydrous ammonia was knifed in prior to planting, collect 25 to 30 cores to get a better indication of the overall available nitrogen status.

Samples should be dried and mixed as quickly as possible before sending them to the MSU Soil and Plant Nutrient Lab. You can also deliver them directly to the lab or have County Extension offices send them. Most commercial soil testing labs provide soil nitrogen testing and are able to provide results within 48 hours of receiving the sample.

How should you interpret the nitrate testing data? First, keep in mind that for a regular PSNT sample, MSU determines the nitrogen credit by multiplying the ppm of nitrate-nitrogen by 6 to obtain a credit in pounds N per acre. The factor of 6 is based on the amount of nitrate measured in the top foot of soil plus an assumption that the amount of nitrate in the second foot (12 to 24 inches) is two-thirds of the amount in the top foot. This relationship was developed after sampling many fields over a period of several years. In general, it is a good relationship. This year, however, may be different. Because of leaching, the second foot of soil may contain more or less than two-thirds the amount of nitrogen as the top foot. This is why we are recommending sampling the second foot of soil. To determine the actual pounds of N per acre in each sample, multiply the ppm nitrate-nitrogen in the 0- to 12-inches and 12- to 24-inches samples by 3.6. Then add the pounds of N per acre in the 0- to 12-inch and 12- to 24-inch samples together to obtain the pounds of N per acre in the soil. The following is an example. The soil test report shows that the 0- to 12-inch sample has 3 ppm and the 12- to 24-inch sample has 7 ppm nitrate-nitrogen. The total amount of N in the soil profile would be: $(3 \times 3.6) + (7 \times 3.6) = 36$ pounds N per acre. For our current weather situation, this method will provide a better estimate of the amount of nitrogen available to your crops.

In most areas of the state, corn is still relatively small and has only accumulated a minor portion of the nitrogen needed. If you applied all or most of your nitrogen at or prior to planting, you will want to consider applying sidedress nitrogen to compensate for losses.

Nitrogen losses due to excessive rainfall

Darryl Warncke and
Carrie Laboski
Crop & Soil Sciences



MSU Weed Tour postponed

The persistent rain has delayed planting of our weed control trials in corn and soybeans. Therefore, the MSU Weed Tour, originally planned for June 30, will need to be rescheduled. Once our trials have been planted, we will be able to identify a new date for the 2004 Weed Tour. -- Jim Kells and Christy Sprague

The amount to sidedress nitrogen would equal your planned nitrogen rate minus the amount of nitrogen measured by the soil test. For example, let's say I applied 150 pounds N per acre prior to planting and based on my soil tests from above, I have 36 pounds N per acre remaining in the soil. I would sidedress 114 pounds of N per acre ($150 - 36 = 114$). You can round the rate up or down to a rate that is

convenient for your operation (perhaps 100 or 120 pounds per acre).

In lieu of a soil nitrate test, applying at least 70 pounds of nitrogen per acre may be appropriate for many cornfields. The nitrogen can be broadcast by land or plane or knifed in once the soil dries out. Knifing or broadcast with cultivation will also provide the benefit of loosening and aerating the soil. **IPM**

Exercise restraint in resuming field operations

Carrie Laboski and
Kurt Thelen
Crop & Soil Sciences



Sidewall compaction on wet soil planter slot.

As your fields begin to dry and you begin to anticipate field operations, remember that trafficking soils that are too wet can create short and long-term damage.

Short term damage

Mudding in your corn and soybeans will create soil compaction. Additionally, you may create sidewall smearing and compaction of the seed furrow. This causes poor seed to soil contact that has several negative consequences including: reduced germination and poor stands; uneven emergence, which reduces yield due to plant-to-plant competition; and restricted root growth that compromises the plant's ability to withstand moisture stress later in the growing season. In addition, the limited rooting can result in phosphorus deficiency even though soil test phosphorus levels are adequate. This occurs because the plant uses all of the phosphorus immediately available within the seed furrow.

The roots of these plants will appear thickened and gnarled – a visual sign of compaction. After a period of time, the roots may break through the compacted sidewalls and explore more of the soil. As this occurs, the phosphorus deficiency may be overcome and the plant will begin growing normally again. However, the sidewall smearing and compaction is likely to have set the crop back by a week or more as it tries to overcome the inhospitable soil environment.

Long term damage

Wet soils compact more than dry soils. Remember that just because the surface soil is dry, doesn't mean the subsoil is dry enough for the ground to be worked or trafficked. Deep compaction is relatively difficult to alleviate and is an annual problem. So be kind to your soil and wait until it is dry enough to traffic. Your patience will be repaid in the form of fewer short and long-term problems. **IPM**

Update on wheat scab in Michigan and using the prediction models

Patrick Hart
Plant Pathology

Because very little wheat, if any, is planted into corn residue in Michigan, the correct model to use for scab prediction is the no corn residue model. This model is predicting low to moderate probability of scab in areas where flowering is just now beginning. Although the model shows a high probability of wheat scab in the thumb, this would be true only if the wheat was just entering the flowering stage, which has not yet occurred and is still at least five to ten days from starting in the more central counties and north. **It is important to consult the model when flowering first occurs, and for the first few days into**

flowering, to obtain an accurate estimate of the probability of wheat scab occurring in your area. High-risk predictions before flowering may not be accurate.

The Folicur label states that Folicur can be applied through the beginning of flowering, and wheat that has been treated with Folicur cannot be harvested within 30 days. Therefore, Folicur should be applied between when flowering is first observed in a field and seven days later. This should keep applications within the label restrictions. Also, Folicur is more effective when applied early versus being applied later into flowering. **IPM**

Impact of the current weather situation on field crops insects

Christina DiFonzo
Entomology

Late planting

Many fields will be planted in early June due to heavy rainfall. In many areas, this will create a patchwork of older (early planted) and younger (June-planted) fields, rather than fields planted over a short period of time. Some insects will tend to favor or accumulate in fields based on crop stage.

- Several insects favor early-planted crops (the oldest fields in a region). Watch for first-generation corn borer in corn (ECB moths were reported in St. Joseph County on May

26) and bean leaf beetles in soybean.

- Several insects favor late-planted crops (the youngest fields in a region). These include second-generation corn borer attacking corn in late July/August; plant Bt hybrids in these fields if possible to avoid second generation damage. Aphid populations also may be greater in late-planted soybean. On the positive side, late-planted crops may escape other insects present earlier in the season, such as bean leaf beetle.
- Late-planted corn has a smaller root

system when corn rootworm eggs hatch. Thus, many larvae starve and root damage is often less, unless conditions are cool and egg hatch is also delayed (not the case this year).

Replanting

Many fields will be replanted due to water damage in May. For replanted fields, all of the comments about late planting apply. Replanting may occur in fields previously treated with an insecticide. In these cases – especially if switching crops (most often from corn or sugar beets to soybeans) – note the following label restrictions.

Soil insecticides

- Aztec: Maximum of one application per acre per season. Corn may be replanted immediately. All other crops can be planted 30-days after the original application.
- Counter CR & 15G: Maximum of one application at planting per season (i.e. cannot replant a Counter treated field w/ another Counter-treated crop)
- Lorsban 15G: One application per year, or maximum 16 oz/ 1,000 feet of row per acre per season.
- Force 3G: Maximum of one application per crop.
- Fortress 5G: Maximum of one application per year.

Seed treatments on corn

- **Cruiser:** Treated areas may be replanted immediately to the following crops – corn, barley, canola, sorghum, succulent and edible podded beans (for example snap beans), sunflower, plus cucurbit/fruitlet/and tuber vegetables. For all other crops, the plant back restriction is 120 days. **This includes soybean and dry bean.** A cover crop may be planted for erosion control sooner than the 120-day interval, but it may not be grazed.
- **Poncho:** Replant to corn and canola immediately. Replant cereal grain, grasses, soybean, and dry beans after 30 days. All other crops equal one year.

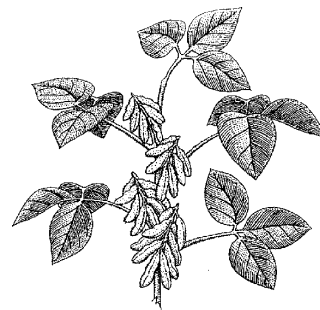
Rainfall, wet conditions

Recent storms brought excessive rainfall, wet fields (or parts of fields), and cloudy conditions to Michigan. These conditions can lead to insect problems later in the season.

- Crops germinating and growing slowly are vulnerable for a longer period of time to early-

season crop pests such as slugs, wireworms, and seedcorn maggot.

- Planting into wet soils can lead to open seed furrows. This increases the chance for slug injury. The slugs literally use the open furrow as an interstate highway to get to the vulnerable seeds and seedlings.
- Heavy rains likely moved soil insecticides out of the root zone. Soil insecticides are not designed to kill all the rootworms hatching in a field. Instead, they benefit yield by protecting the central part of the root mass and the brace roots. If excessive rainfall moves insecticides out of this zone, growers may see unexpected rootworm damage later in the season.
- Seed treatments may also be effected by excessive rainfall. Cruiser is very water-soluble (a good thing if conditions are dry!), and it may move out of the root zone.
- Wet conditions have delayed herbicide applications. Armyworms and cutworms often target weedy fields or parts of fields for egg laying. Once herbicides are applied, these caterpillars leave the dying weeds and move onto the crop. After herbicide application, check such fields for cut-plants or armyworm feeding.
- It has been difficult to spray or cut weevil-infested alfalfa. If weevils are over threshold and you cannot get into the field to cut, an aerial application is probably not as good as a ground application, but better than doing nothing. Weevils in the southern part of the state are already quite large, and may be pupate before the alfalfa is cut. If weevils are still in the larval stage at cutting time, remember to check regrowth for feeding – big hungry weevil larvae could do significant damage to new growth in a short period of time.
- If cutting is delayed so alfalfa is blooming, but a spray is needed, watch for honeybees and note bee restrictions on the label. Inform neighboring beekeepers about the treatment, as they may be able to move or cover hives.
- Depending on wind direction and storm track, storms probably carried pest insects from south to north, depositing them further up into central Michigan and the Thumb. This includes insects such as potato leafhopper (confirmed in St Joseph County), grain aphids, armyworm, and cutworm (small cutworms seen in Saginaw County). **IPM**



An evaluation of annual crops planted for emergency forage

Richard Leep, Tim Dietz,
Tim Boring, and
Do-Hong Min
Crop & Soil Sciences

Forages are the basis of ruminant diets and livestock producers need a constant supply of forages for their animals. However, weather can make the production of enough quantities of quality forage a challenge. Questions that need to be answered include: What can I do when forage crops cannot be planted on time

due to weather challenges? I need a constant supply of forage; what are alternative crops to plant? What forage crop can I plant that will give me reasonable forage yield and quality when planted later in June? To help answer these and other related questions we set up a demonstration study that includes a series of

alternative crop options.

Perennial forage crops are the foundation of sustainable ruminant livestock operations in Michigan. Unfortunately, because of the harshness of Michigan’s climate, perennial forage crops, and particularly alfalfa, occasionally winterkill, leaving the producer faced with an immediate loss in supply of high quality forage. In other years, excess spring moisture does not allow producers to seed perennial forages during the window of time that typically ensures the greatest likelihood of establishment success. The producer is thus faced with a forage supply shortage and will generally need to plant an annual forage crop to fill the gap.

The 2004 growing season this spring provides a prime example of the latter situation, and many producers are seeking information on what to plant for emergency forage in June. While some information exists on yield and feeding value of various alternative annual crops, there is no comprehensive comparative information, particularly at the late planting dates compared with corn silage. Proper selection and management of the emergency forage can be a key to the farm’s short- and long-term profitability and sustainability.

We seeded an experiment at East Lansing, Michigan comparing alfalfa to fourteen different annual crops with forage potential in replicated plots in the summer of 2003. The crop species for the East Lansing location are listed in table 1. In addition, a demonstration trial was established at the Lake City Experiment Station in Lake City, Michigan where we planted eleven different annual forage crops. The crop species for Lake City are given in Table 2.

The early and medium planting dates were May 19 and June 16 respectively. Corn was seeded 1 to 1.5 inches deep in four 30-inch rows with a 4-row corn planter. All other entries were seeded in ten six-inch rows to a 0.25- to one-inch depth depending on seed size. Plots including legumes were inoculated with the proper *Rhizobium* species. Fertilizer was applied according to Tri-State fertilizer recommendations and was not a limiting factor.

All warm-season grasses (corn, sudan, millets) received 75 lb N/ac within 10 days after planting, and those grass entries with multiple harvests received an additional 50 lb N/ac after each cutting (except the final cutting). Thus, entries with 3 harvests received 175 lb N/ac during the season.

All corn plots were harvested by cutting the center two rows of each four-row plot to a six-inch stubble. The remaining entries were harvested with a flail harvester. Stubble height for sudangrass, sorghum x sudan, pearl millet, and Japanese millet was six inches to encourage regrowth, with the last harvest at three inches. All other entries were cut to three-inch stubble. In general, harvest timing was scheduled to optimize yield and quality. The exception was the final harvest of multi-cut warm-season grasses, which were allowed to mature until temperatures were too cool for continued growth in September. Based on previous research on regrowth potential after harvesting, sudangrass, sorghum x sudan, hybrid pearl millet, and Japanese millet were scheduled for multiple harvests; and the foxtail millets were scheduled for just one harvest at boot stage.

Yield data were collected at each harvest. Feeding value will be determined on samples of harvested material by drying and grinding the material and analyzing for several parameters by the University of Minnesota Forage Quality laboratory. Feeding value (forage quality) parameters will include crude protein, neutral detergent fiber (NDF), NDF-bound crude protein, ether extract, ash, and NDF digestibility. For some of the forage species, starch content will also be measured. An economic evaluation of the forage options for use by dairy and beef farms based on yield, production cost, and feeding value parameters will be performed.

East Lansing results

Total season yield results are reported in Table 1 (East Lansing) and Table 2 (Lake City). Feeding quality data are not available yet. We caution that these are only one-year yield results and we need two years of data in order to make final conclusions.

Table 1. Influence of planting date on total season dry matter (DM) yields of emergency forages at East Lansing, MI in 2003

Entry	Early May 19	Mid June 16
	Tons dry matter/acre	
Corn (81 day RM)	8.7	5.2
Corn (95 day RM)	10.0	6.5
Corn (103 day RM)	7.2	8.1
Sudangrass	6.9	6.1
Sorghum x Sudan	6.3	6.1
Japanese Millet	.	3.1
Hybrid Pearl Millet	3.8	3.8
Barley	1.4	0.8
Barley/Pea	1.4	1.2
Oat/Pea	3.2	1.1
Soybean (0.8 RM)	4.1	2.6
Soybean (2.0 RM)	4.0	2.7
Siberian Foxtail Millet	5.3	2.1
Golden German Millet	5.0	6.7
Alfalfa	1.0	0.3
Mean	4.9	4.0
LSD(0.05)*	1.5	1.4

* Least Significant Difference: minimum value between yields for a real difference to exist

Table 2. Total season dry matter (DM) yields of emergency forages at Lake City, Michigan planted on 6/5/03 and harvested on 8/6/03.

Species*	DM tons/a
Siberian Millet	3.64
German Millet	2.64
Alfalfa	0.95
Sudan grass	2.97
Japanese Millet	2.95
Soybean Group II	1.47
Sudex (Greentreat IV)	4.46
Pearl Millet	2.42
Soybean Group 0	1.16
Barley	2.41
Sudex (Drip o’ Honey)	6.09

Yields of warm-season species were high at both locations, probably due to the combined effects of above average temperature and timely rainfall. Entries did not always produce less at later planting dates. For example, in East Lansing, yields of the 81 and 95 RM corn entries planted June 16 were lower than the earlier planting dates. However, the longer-season 103 RM corn did produce a slightly higher yield at the later planting date. This was probably due to poor pollination from the May 19 planting date.

The 81- and 95-day corn silage resulted in significantly higher yields compared to other treatments in the first planting. Sudangrass yield in the first planting was not significantly different than the 103-day corn silage. German millet, sudangrass, and sudanxorghum hybrid yield was similar to the 81 and 95-day corn silage varieties in the later planting date. The 103-day corn silage variety yield was significantly higher than all other treatments in the later planting date. Sorghum-sudangrass hybrids and Sudangrass were cut three times for each planting time. Siberian millet provided two cuts with the first planting but only one cut in the later planting while German and Pearl millets provided enough regrowth to be cut twice with each planting.

Barley, barley/pea and oat/pea did not provide as much forage as the sudangrass or sorghum-sudangrass hybrids. The oat/pea forage was significantly higher than the

barley or barley/pea forages in the first planting time but similar with the second planting date.

There was no significant difference between the Group 0 or II soybeans in yield at either planting date, however, the second planting date resulted in significantly less yield than the first planting date 2.7 versus 4.0 tons/acre. Alfalfa generally produced considerably less forage than all warm-season species at either planting date, indicating the potential emergency forage value of the warm-season species.

Lake City results

There was only one harvest at the Lake City site. The sudax (sudan x sorghum hybrids) resulted in the highest yields with an average yield of 6.1 and 4.5 tons/acre dry matter for the (Drip o' Honey) and (Greentreat IV) varieties. Siberian millet was the third highest yielding crop with 3.6 ton/acre dry matter. The yield of sudan grass, German millet, pearl milled, and barley were similar. Yield of soybean was 1.5 and 1.2 tons/acre compared to clear seeded alfalfa yield of 1.0 ton/acre. These data show the potential of annual forages for providing significant forage dry matter in a short amount of time. In fact, the average yield of alfalfa varieties from established stands that were harvested at Lake City was 2.6 tons/acre, while the rescue forage species averaged 2.8 tons/acre. **IPM**

The the precipitation totals table visit: http://www.agweather.geo.msu.edu/Misc-Data/precip2.txt

The heavy rains have caused deep rill and gully erosion in some sloping fields. These rills and gullies pose a safety risk to tractor operators by increasing the potential for rollover accidents. If the field has not already been planted, you can reduce the risk by repairing eroded areas using a light utility tractor and a three-point hitch mounted back blade prior to resuming normal field operations. Straddle the eroded area with the tractor and tilt and angle the blade. If the eroded areas cannot be repaired prior to continuing field operations, make sure to drive slowly when working in affected areas. Higher speeds increase tractor instability.

Be especially careful when driving across

steep slopes. If the downhill tire falls into a rill or gully before the uphill tire, the tractor may rollover. Take care when working up and down the slope as well. Some rills or gullies may be so deep that the tractor will rollover if one of the tires slips into the eroded area. If a tire does slip into a washout, steer the tractor into the gully and bring it to a stop. Don't try to quickly turn the tractor out of the gully as this can increase the chance of a rollover accident. Always wear your seat belt when operating tractors equipped with rollover protection. The tractor's rollover protection will not provide adequate safety unless the seat belt is worn and is properly adjusted.

Rill and gully erosion increases risk of tractor rollovers

Mike Staton
ANR Extension Agent



Regional reports

1 - Southeast

Mike Score

Weather

I blocked off a lot of time to scout fields and assess the impact of severe storms that rolled through southeastern Michigan this week. There is a wide range of weather impacts among farms. Each farmer will have some difficult decisions to make given this year's weather.

Commodity reports

Recent storms were not the first major weather event affecting **winter wheat** yield potential. It seems hard to believe when we gaze at ponds in agricultural fields that this April was very dry. Wheat growing in sandier soils was stunted. Tillering was weak, and plant height was stunted. It is not uncommon for wheat on drought-prone soils to have an estimated yield potential of 40 bushels per acre. Wheat is still standing well, in spite of the 60 to 90 mph winds of last weekend. Hail damage is common in our region. Yields will be lowered, however, a region-wide damage estimate is difficult to calculate. Septoria leaf blotch and powdery mildew infections on flag leaves can be found. Infection levels are low. As Dr. Pat Hart points out, our wheat crop has passed the growth stage during which fungicides can be applied to control these diseases.

Corn planted prior to heavy rainfall is growing well. Hail damage is not expected to make a major dent in yields. Flooded areas will provide farmers with replant decisions. More importantly, farmers are trying to decide the probability of herbicide and nitrogen leaching. Nitrogen leaching can be studied through use of PSNT tests. Farmers do not seem excited about the inconvenience of pulling PSNT

samples. Most will probably assume some or all of the nitrogen they applied has washed through the root zone. More progressive farmers are inquiring about PSNT sample protocols. Weed pressure in cornfields is increasing rapidly. There is concern that weeds will grow quickly beyond recommended heights for effective control strategies. Many farmers will not be able to spray for 10 to 14 days if it does not rain. Added rainfall will postpone weed control measures even further. Farmers who used pre-emergent herbicides are aware of the increased risk for herbicide injury. Along with postponed weed control comes delays in final corn planting. Farmers typically make decisions about switching over to soybeans between June 1 and June 7.

Soybeans planted prior to region-wide storms emerged well. Unfortunately, hail was a common weather event across our region. Some fields were heavily damaged with plants being severed below growing points. Farmers with heavily damaged fields will be faced with replant decisions. Many other farms had simple defoliation of first leaves with growing points left in place. These beans are expected to continue development without major yield loss.

Alfalfa will suffer the heaviest losses from heavy rains. Alfalfa was in full bud stage late last week and was ready for first cutting. High winds resulted in plant lodging. Heavy rainfall makes first cutting unlikely over the next couple of weeks. Additional heavy rainfall in the forecast could push first cutting well into June. Delayed cutting, combined with heavy alfalfa weevil feeding could provide a real one-two punch to the region's alfalfa crop. **IPM**

2 - Southwest

Bruce MacKellar

Weather

Heavy thunderstorms turned violent last Friday (May 21), producing heavy rains, high winds and some hail. Rainfall totals ranging from 1.5 to 3 additional inches were common. Most fieldwork has been on hold for this last week.

Commodity reports

In **alfalfa**, producers are in a holding pattern for now, waiting for dryer weather to harvest. Weevil is still active. Potato leafhoppers are beginning to be found in low numbers in sweepnet sampling.

The **wheat** crop is looking good to excellent right now. Powdery mildew is moving up the canopy on some fields, but is not on the flag leaf at this point. We will be looking at fields for diseases over the next week or two.

The early-planted **corn** is now at the 2 to 3

collar stage. European corn borer moths are beginning to emerge in the southern tier of counties. Cutworms have been clipping some of the later-planted corn. I have not seen much armyworm damage yet this season. Triazine-resistant lambsquarters are beginning to become noticeable in fields where pre-emergence herbicides were applied. There may be some weeds coming through on fields that were sprayed and then received excessive rainfall.

In **seed corn**, growers are falling further behind planting schedules. Growers continue struggling to get through fields to get male or female inbreds planted for proper delays. Compaction may become a significant issue on these fields.

Early planted **potatoes** are beginning to show flower buds. Plants continue to look very good, with little insect or disease

pressure in fields in St. Joseph County. Some minor hail damage can be found at some areas.

Soybean planting continues to lag behind other crops. Beans planted early are looking

very good. Cutworms are more likely to be an issue where weeds have come up in fields not planted yet. **IPM**

Weather

Rainfall for the week has been another two plus inches at Entrican with some areas of Montcalm County receiving over three inches on Friday, Saturday and Sunday (May 21-23) of this past week. Little progress has been made in planting, as fields remain too wet. This makes three weeks with no real planting progress. Temperatures have remained warm over last week, high air temperatures from the mid to upper 60's F and lows 40's F and 50's F. Soil temperatures remain warm with low soil temperatures in the 50's F.

Rain, floods, frustration. The prolonged rainy season has producers edgy and very frustrated. Trying to do something after hardly turning a wheel the past two to three weeks, farmers in Newago County are using backhoes, dozers, plows, and hand shovels in making crude ditches and mud trenches to drain surface water off from saturated fields. Some farmers in Montcalm who can drive on fields are mudding corn, peas, and potatoes in.

Commodity reports

Alfalfa growth is at 18 to 22 inches. Many fields are starting to lodge. Fields should be monitored for alfalfa weevil as feeding injury is at or above threshold in some areas. GDD41 totals as of May 25 are: Ionia 793, Entrican 706, Big Rapids 644 Fremont 710. While many would like to start harvest of first cutting many fields have standing water in them. What started out as an excellent first cutting alfalfa crop may not be as good of quality as we had hoped.

In **pastures**, pugging on wet soils and advancing quality decline are the current challenges.

Wheat is in growth stage Feeke's 10-10.1. The question of the week is; what will be weather conditions during flowering?

Oats are growing well except for the washed-out and flooded areas of fields.

Corn planting is holding at 40 to 50 percent of the crop planted. Corn planted early is emerging with fair stands on high ground. Corn on the heavier soils is not fairing as well. **IPM**

3 – West Central

Fred Springborn

Weather

The region has received record amounts of rain over the past weeks similar to the rest of the state. Unofficial amounts vary, however some farmers have recorded up to 12 inches over the past three weeks. Needless to say, soils are saturated and it will be a few days before any fieldwork will be done. There is a great deal of anxiety over all production issues including weedy fields, nitrogen loss, replant decisions, disease concerns, switching varieties, and the list goes on and on. Many farmers have good corn contracts and are reluctant to switch to beans.

Commodity reports

The **corn** planted has emerged and looks surprisingly good despite less than desirable conditions. Many fields have areas drowned-out and may be replanted. It will be important that growers switch to early maturing varieties as our growing season is shortened. Caution should be taken if you plan to switch to soybeans if you have preemergence herbicides with rotation restrictions. Refer to the *Weed Control Guide* for more information.

Most of the early planted **soybeans** have emerged. There is concern about seedling diseases in the emerged beans. Weeds are everywhere.

The **wheat** crop is heading with light disease pressure at this time. The big concern is the potential for scab. Many growers feel the wheat crop may be their best crop this year and are willing to manage the crop for the highest yields. Growers need to scout the fields before fungicide applications are made. We still have some nitrogen applications being made because wet soils have keep them out of the fields.

Alfalfa is ready to harvest. Most farmers are gearing up to finish planting corn and beans and harvest alfalfa at the same time. We are seeing alfalfa weevil pressure but not over threshold. We expect cutting will be the best option to manage this pest. Yield potential if very good if we can get it harvest in a timely manner. The new seedlings are struggling with the wet soils. There are concerns with seedling diseases.

The **oat** crop really looks sick. The stands are very good but the saturated soils have caused the crop to look very yellow. Warm weather and heat should bring the crop back around.

Sugar beets are growing slowly and weed control has been challenging to say the least. Stand will be reduced due to drowned out areas. **IPM**

4 – Central

Paul Gross

5 – Thumb

Mark Seamon

Weather

We are near the wettest May in history for this area. The two to four inches of rainfall this week has added to this statistic. This explains the agricultural activity in the past week (or three). Cool temperatures are reducing evaporation rates.

Commodity reports

We are near the GDD42 accumulation of 700 for first cutting of **alfalfa**, but field conditions will not allow for harvest until we can get several days without rain.

In **sugar beets**, weed control is a big concern with herbicide applications being delayed beyond both recommended GDD accumulations and weed size. Root diseases are showing up in some fields but overall impact of this is not known yet. Replanting of some fields is still waiting for dry soil to get on the field. Crop growth has been good where there has been some relief from standing water or saturated soils.

Many early-planted cornfields are looking

good with 6 to 8 inch **corn**. Most of these fields were planted before April 20. Fields planted in the last week of April and in the first week of May have had considerable challenges with emergence and are looking variable in stand.

Heads are emerging in **wheat** in many fields this week. There is some concern about head scab and applying a fungicide to protect the wheat crop from infection. The current scab prediction model is showing a low or moderate chance of infection at flowering for most parts of this area. The one exception is one area in the Eastern and Southern Thumb. Please consult the prediction model for an update to help make the decision to apply a preventative fungicide. You can see the model at: <http://www.wheatscab.psu.edu/>

Some early-planted **soybean** fields have emerged and are looking good. Growth and development are slow due to cool, wet conditions. Plant health appears good at this time. **IPM**

6 – Northern Lower Peninsula

Dave Glenn

Weather

Cool, wet weather the past week has stopped all fieldwork and planting. Cooler weather prior to that delayed many plantings also. So now, most everyone is behind in planting with more wet weather expected for the weekend. Some planting will start up on Thursday (May 27) as a short reprieve from the rain moves in. Cold weather Thursday night and Friday morning call for temperature in the mid 30's. Some concern for the few vegetable crops and potatoes, but with waterlogged soils, hopefully no major problems will arise.

Commodity reports

Corn planting has remained at a stand still. Some producers are 100 percent planted with others yet to start. Most are about 30 to 50

percent done. Most plantings in the ground seem to be emerging rather uniformly despite the heavy rains.

Wheat is continuing to do well with all the moisture. We are about 10 to 14 days from heading though. No known diseases at this point, but then again, most fields have been too wet to get into to even check.

No changes from last week in **soybean** planting. Some fields are in but not emerged yet. Concern about crusting after the 10 days of rain.

Dry bean planting will begin as soon as the fields dry and can be worked.

Hay and **alfalfa** fields look as good as they have in many years. No major issues to date.

Oat and **rye** look excellent with great germination and emergence. Rye is heading out in most fields now.

Anatomy of a record-breaking wet month[Jeff Andresen](#)Agricultural Meteorology
Geography

During the first week in May, jet stream flow across North America took on a southwest to northeast configuration with a broad ridge along the US/Canadian border. With a surface frontal boundary lingering in or near the state and ample Gulf of Mexico-origin moisture transported northward on southerly winds, weather across much of the Midwest has been unusually wet and stormy ever since. Severe weather was also common with this pattern with more than 200 tornadoes reported across the US (mainly in the Midwest) thus far in May alone. Rainfall totals for the month thus far (through May 25) across the US are given in Figure 1.

Regionally, heavy rain (typically 4 to 8 inches or more) fell during this period from the Lower Mississippi Valley northward to the western Corn Belt and eastward to the mid-Atlantic and New England regions.

In Michigan, the heaviest precipitation fell across central and southern sections of the Lower Peninsula, where totals for May thus far now exceed 10 inches in some cases. Totals of this magnitude put May of 2004 in special company in a historical context. Some reporting stations in central and southern Lower Michigan have set new records for the most May rainfall (normal rainfall for the month ranges from 2.8 to 3.2 inches), and a

few are even nearing records for most precipitation for any month (The wettest months on record at most stations are generally on the order of 10 to 15 inches.).

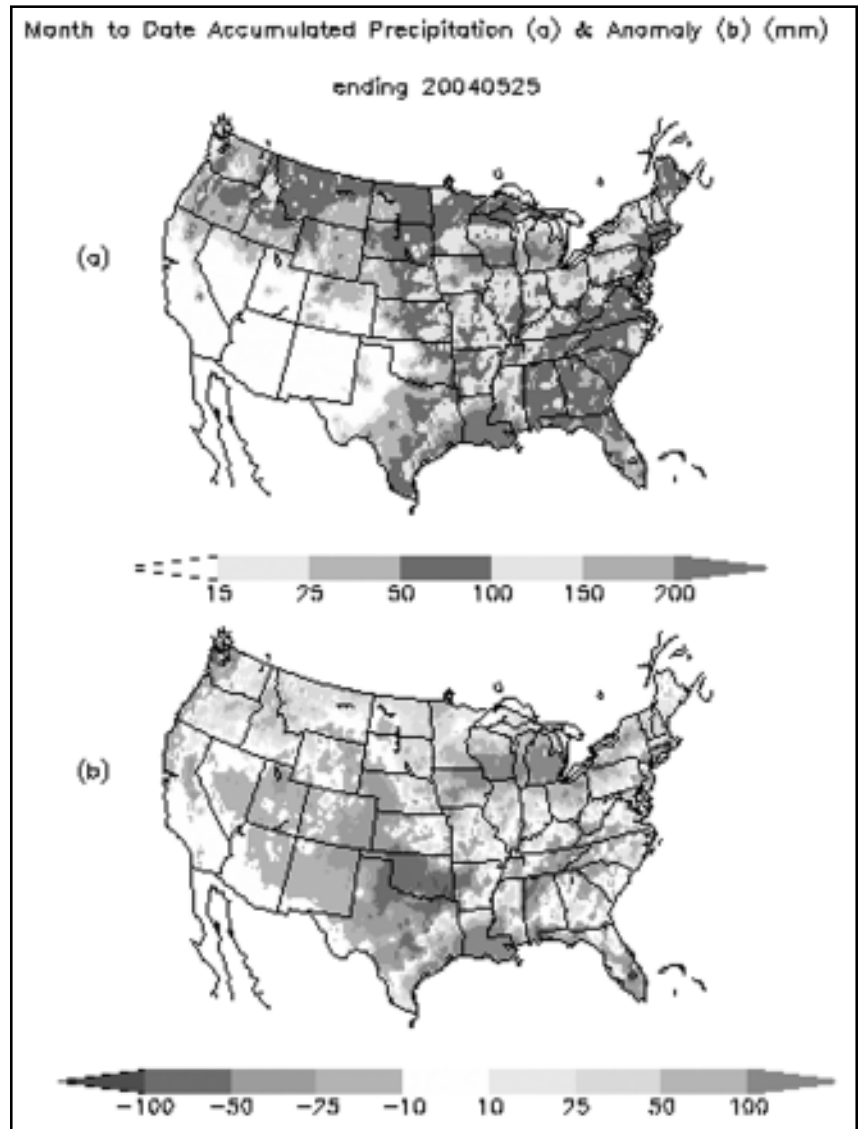
When will it end?

In short, the forecast for the upcoming several days calls for more rainfall, but amounts and areal coverage should be less than that of the past week. A cool front is expected to pass through the state Thursday (May 27), bringing the chance for showers and a few thunderstorms. In contrast to the past couple of weeks, rainfall with this system should remain on the light to moderate side with totals generally ranging from 0.25 to 0.50 inches where precipitation occurs. Fair and drier weather is likely Friday and Saturday.

With high pressure centered over the region late Thursday through Saturday morning, frost and even some freezing temperatures will be possible Friday and Saturday morning, mainly in interior northern sections of the state. The early part of the upcoming holiday weekend is expected to be mostly dry, although rainfall will be possible once again by late Saturday and Sunday continuing into Monday as a slow-moving weather system approaches the state from the northwest. This system will likely persist across the region for at least the first several days of next week with relatively cool, cloudy conditions and almost a daily chance of scattered afternoon showers. Overall, however, the best chances for significant rainfall across the state will likely be on Sunday. Daytime temperatures during the next few days will range from the upper 50's and 60's north to the low or mid 70's south with lows in the 30's north to 40's south.

In the medium-range time frame, there is news to report, as computer model guidance strongly suggests the transition to a different upper air pattern that would lead to a somewhat drier weather pattern in Michigan. For both the **6-10 day and 8-14 day time frames**, covering June 1-5 and June 3-8, the NOAA CPC outlooks call for below normal temperatures state- and region-wide. Unfortunately, the cooler temperatures would slow both vegetative growth and evapotranspiration rates, which would both

tend to lengthen fieldwork delays. Projected precipitation totals in the two time frames reflect the forecast upper air changes noted above. For the 6-10 day period, precipitation is forecast to range from near normal in western sections of Upper Michigan to above normal elsewhere. For the 8-14 day time frame, however, precipitation totals are forecast to decrease to below normal levels across northern and western sections of the state, and to near normal levels across the remainder of the state. **IPM**



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