

Angie Johnson, Agriculture & Natural Resources Extension Agent – Steele County

County Highlights

Finally a week with warmer temperatures to hasten our growing degree days! Small grains look tremendous, as they are in the jointing stage with some winter wheat fields at the boot leaf stage. Keep in mind about spraying a fungicide to prevent against scab. NDSU has a small grains forecasting model that can be used to help determine the risk of fungal infections <http://www.ag.ndsu.edu/cropdisease/>. Also, fungicide guides are available in the Extension office to compare products and understand application rates. Sunflowers are emerging fast too, along with edible beans. At least the threat of frost is now behind us, and we can enjoy what is left of our extremely short summer! Keep an eye out for resistant weeds in your fields. The overuse of Round-Up has created new biotypes of weeds to develop, and so make sure you are working with your agronomist (and Extension Agent) to be sure that you are doing what is best for YOUR field. I also wanted to make note that the Steele County Weed Board will be purchasing flea beetles this year for producers interested in a biological control for Leafy Spurge. A land description is required. **Deadline to request insects is June 23rd.** Also note, that the Steele County Weed Board does have a reimbursement program for landowners to control noxious weeds. Please contact the office for more details.

Local Rainfall & GDD

	Finley	Mayville	Pillsbury	Cooperstown
Corn GDD (Plant Date: 5/1/15)	406	430	405	412
Compared to 2014	NA	431	442	NA
Compared to 5 year average	NA	436	412	NA
Wheat Accumulated GDD (Plant Date: 4/15/15)	1243	1252	1241	1221
Compared to 2014	NA	1219	1225	NA
Compared to 5 year average	NA	1265	1233	NA
Sunflower GDD (Plant Date: 5/11/15)	475	504	485	480
Compared to 2014	NA	552	566	NA
Compared to 5 year average	NA	534	515	NA
Rain since May 1	6.02	4.67	6.93	5.86



Angie Johnson

Soybean Growth & Development

By: Hans Kandel, NDSU Extension
Agronomist—Broadleaf

Table 1. Growth stages of Soybean

At this time of the year, soybeans have emerged or are emerging. Soybean plant development has two distinct phases. The first is the vegetative stage (V) which starts at emergence and leaf development (Table 1). The second phase in the development is the reproductive (R) stage which starts with flowering, followed by pod development, and ends when the seed is fully mature.

Plant stages are determined by the leaf, flower, pod, and seed development within the pods. A leaf is considered fully developed when the leaf at the node directly above it (the next younger leaf) has expanded enough so that the three leaflets, which make up the “trifoliolate leaf”, are fully visible. Leaf development will continue during the reproductive phase and plant stature will still increase. The growth stages can overlap. On a field level a growth stage is reached when 50% or more of the plants are in, or beyond, the growth stage as indicated in Table 1. Flowering of the soybean plant is initiated (after the longest day) on the third to sixth main stem node (a node is a part of the stem where a leaf is attached) and continues upward and downward from there. First flowers of timely planted soybean are usually found in the second week of July. Pollination and fertilization are usually accomplished before the soybean flower opens.

The critical growth stage in soybean for drought stress is from flowering to seed fill. Any stress from the R4-R6 (late pod development to early seed fill) will cause more yield reduction than if the drought stress takes

place at another time in the plant’s development. The seed is physiological mature when 95% of the pods on the plant have the mature color. The date of soybean maturity is associated with the soybean maturity group. Early maturing soybean may be mature by the middle of September.

Stage	General Description	Specific Description
VE	Emergence	Plant is emerging.
VC	Cotyledon	Unifoliolate leaves fully developed.
V1	First true leaf	The first trifoliolate leaves are fully developed.
V(n)	Leaf development	Additional trifoliolate leaves are fully developed.
R1	Beginning bloom	One open flower at any node on the main stem.
R2	Full bloom	Open flower at one of the two uppermost nodes on the main stem with fully developed leaf.
R3	Beginning pod	Pod is 3/16 inch long at one of the four uppermost nodes on the main stem with a fully developed leaf.
R4	Full pod	Pod is 3/4 inch long at one of the four uppermost nodes on the main stem with a fully developed leaf.
R5	Beginning seed	Seed is 1/8 inch long in the pod at one of the four uppermost nodes on the main stem with a fully developed leaf.
R6	Full seed	Pod containing a green seed that fills the pod cavity at one of the four uppermost nodes on the main stem with a fully developed leaf.
R7	Beginning maturity	One normal pod on the main stem that has reached its mature pod color, normally brown or tan, depending on variety.
R8	Full maturity (physiological mature)	Ninety-five percent of the pods have reached their mature pod color.

Small Grain & Corn Development: 2015 Growing Season

By: Joel Ransom, NDSU Ext. Agronomist—Cereal Crops

Small grain acres were planted one to three weeks earlier this year than the long term average. Early planted small grains usually develop greater yield potential as the cooler temperatures normally encountered in early spring favor the development of more tillers and larger spikes. Additionally, wheat growing degree days (GDDs) this year are running 50 to 100 behind normal, further favoring high yield potential development. For the early planted small grain crops that had adequate moisture to establish a good stand and that have not suffered from waterlogging in recent days, the prospect at the point for very high yield is favorable. It would be my assessment that we have the potential for very good yields this year. Higher than expected yields usually means lower than desired protein. For wheat, some additional nitrogen might add some value to the crop by improving the protein content.

Much of the corn was planted before the first week of May. Planting corn early improves the chance that the crop will mature and dry down in good time in the fall. Unlike the small grains, however, corn yield potential is not been favored by this year's abnormally cool spring. Corn GDDs are running about 30 behind the long term average, negating some of the beneficial effect of earlier planting on maturity. The dry soils early in the spring and then the wet cool soils later have negatively impacted corn stands in some fields. With the recent warm weather, corn will start to green up as roots expand and have greater access essential nutrients. Excess soil moisture may be the most significant factor impacting yield development in corn to date.

Impacts of waterlogging

Waterlogging (flooded/ponded/saturated soils) has been common in many fields this year, particularly in heavy valley soils with minimal slope. Waterlogging affects a number of biological and chemical processes in plants and soils that can impact crop growth in both the short and long term. Plants need oxygen for cell division, growth and the uptake and transport of nutrients. The rate of oxygen depletion in a saturated soil is impacted by temperature and the rate of biological activity in the soil. Faster oxygen depletion occurs when temperatures are higher and when soils are actively metabolizing organic matter. With the recent warm weather, the negative impacts of excessive water will accelerate. Generally, the oxygen level in a saturated soil reaches the point that is harmful to plant growth after about 48-96 hours. Crops are more sensitive to waterlogging when they are still below the surface of the soil, so most of our crops are in a stage that can tolerate some period of waterlogging. In cases where the crops have fully canopied, evapotranspiration should hasten the elimination of excess moisture. Waterlogged conditions also reduce root growth and can predispose the plant to root rots, so the ultimate effect of excess moisture may not be known until late in the season. It is common to observe plants that have experienced waterlogging to be especially sensitive to hot temperatures and to display nitrogen and phosphorus deficiencies later in the season due to restricted root development. Waterlogging can also impact the availability of nitrogen in the soil. Excessive water can leach nitrate nitrogen beyond the rooting zone of the developing plant, particularly in well-drained lighter textured soils. In heavier soils, nitrate nitrogen can be lost through denitrification. Research conducted in other states found losses from denitrification between 1 and 5% for each day that the soil remains saturated.

Corn Yellowing Update

By: Dave Franzen, NDSU Extension Soil Specialist

Most fields with corn have begun to green up with much warmer temperatures. There are some areas, particularly in medium to sandy soils on ridges/slopes that have begun to show signs of N or S deficiency. Again, S deficiency will show on newer leaves, while the lower leaves are greener. N deficiency shows up on bottom leaves, with new leaves greener. Contrasting plant samples will help confirm deficiency, but take one from a 'good' area and one from a 'not-so-good'

area where N/S deficiency is suspected.

Most corn is still very small, less than V4, so over-the-top ammonium sulfate granules will still work. Also, streamed between the rows ammonium sulfate solution or ammonium thiosulfate will also work for S.

If the problem is N, the best for side-dress would be to wait until this wet period is over, perhaps about V6; however, if the corn is very yellow from extreme losses, now is better than later.

A coulter-applied UAN between every other row is preferred in high clay Valley Soils. Ammonia will work fine west of the Valley on soils that are not too wet. Coulter-applied UAN is more nimble in variable soils with wet and dry in the same field. Go deeper in drier soils and shallower when the soils are wet. Second on the list of preferences would be streamed UAN between the rows. Use this over y-tubes in our region because y-tubes are made for areas with heavy dew every morning. In this region, heavy dews happen once in a great while, and considering the cost of y-tubes, streamed every row UAN should perform as well. Last on the list is urease-treated urea over the top of corn. Either an NBPT product, similar to Agrotain from Koch, or the Limus product from BASF will be effective. Any other chemistry is either untried, or tested poorly in urease inhibitor studies.

Be Tick Smart!

By: Janet Knodel—Extension Entomologist

With warmer spring weather, tick season is upon us. So far, we have identified the smaller black legged tick (or deer tick), *Ixodes scapularis*, from Clay County, Minnesota and the larger dog ticks, *Dermacentor variabilis*, from areas of North Dakota and Minnesota. The Center for Disease Control and Prevention (CDC) recommends the following strategies for field workers and preventing tick bites:

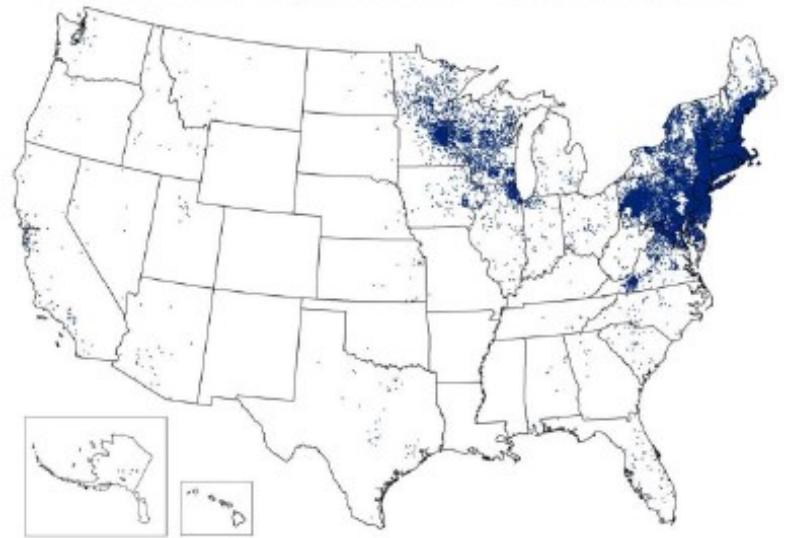
- Minimizing Direct Contact with Ticks by avoiding woody and high grass areas and walking in center of trails, if possible. Ticks are most active in May through August in North Dakota.
- Use repellent with 20-30% DEET (N,N-diethyl-m-toluamide) on exposed skin and clothing. This should provide several hours of protection. Or wear clothing treated with permethrin.
- Quickly find and remove any ticks from body by using a tweezers. Grasp tick close to skin and pull straight up to avoid breaking off the tick's mouthparts in the skin. Clean bite area with rubbing alcohol or soap and water.
- Inspect and bath yourself within 2 hours after coming indoors to find any ticks crawling on you and to remove them before they attach to feed on your blood. Ticks like to hides in hair, armpits and other areas that may be difficult to inspect.
- Wash any clothing that you were wearing soon and then dry in high heat for an hour to kill any ticks. Otherwise, ticks can attach to you later after hitchhiking on your clothes into your home.
- Reduce tick habitat near home.
 - o Keep lawns mowed around home.
 - o Place a 3-ft wide barrier of wood chips or gravel between lawns, patio or play areas and wooded areas to prevent tick movement.
 - o Exclude wildlife (especially deer) that may be carrying ticks into your yard.
- Some insecticides registered for control of ticks by homeowners in residential areas include: carbaryl (Sevin®), cyfluthrin (Tempo®, Powerforce™), permethrin (Astro®, Ortho® products, Bonide® products), and pyrethrin (Pyrenone®, Kicker®). Always read and follow the EPA approved label on the product container.



The CDC estimates that 300,000 people annually get Lyme disease in the United States. *Ixodes scapularis* vectors Lyme disease. Lyme disease is concentrated in 14 states in the Northeast and upper Midwest regions. The incidence of Lyme disease is near 26.4% in Minnesota and 1.7% in North Dakota in 2013. Lyme disease is caused by the bacterium *Borrelia burgdorferi*. Symptoms of Lyme disease includes: Bull's eye rash, headache, fever and fatigue. In a worst case scenario,

infections can cause arthritic joints, and affect the nervous system causing facial paralysis, and spinal cord, brain or heart problems. Lyme disease must be treated immediately with antibiotics. It can take 2 to 3 weeks to recovery if treated early. The later you wait for treatment; your symptoms will become more severe and more difficult to cure. For more information, please see the CDC website: <http://www.cdc.gov/Lyme/>

Reported Cases of Lyme Disease—United States, 2013



1 dot placed randomly within county of residence for each confirmed case

Mosquitoes Swarming Livestock in Pastures

By: Janet Knodel—NDSU Extension Entomologist

With all the rain this spring, blood-sucking mosquitoes are swarming and aggressively biting livestock in pastures.

Livestock spend more time scratching mosquito bites and less time feeding causing weight loss and decreased milk production. Mosquitoes also vector deadly viruses including West Nile Virus and encephalitis (sleeping sickness). Standing, stagnant water is the key to breeding floodwater mosquitoes, and includes flooded ditches, fields, or ponds. It only takes 4 days for these mosquitoes to complete their life cycle. The egg and larval stages are dependent on the stagnant water to develop. However, eggs can survive a temporary dry period.

There are four main strategies to reduce mosquito populations:

- 1) Reduce standing water. Draining wet pasture areas are not always possible or feasible. Hopefully, drier, sunny warm days are in our future weather forecast to reduce mosquito breeding sites. Clean out cattle tanks and watering troughs at least once a week. Around the farmstead or home, one should empty and regularly clean water in birdbaths, fountains, wading pools, rain barrels or gutters.
- 2) Keep weeds trimmed around watering ponds and ditches to reduce the hiding places for adult mosquitoes. Mosquitoes prefer weedy and shallow wet areas for breeding.
- 3) Use wipes, sprays, and fogs for temporary relief of painful mosquito bites to livestock. The same insect repellents used for fly control will help decrease mosquito bites. Mosquitoes feed at night, so keeping livestock in barns at night reduces bites.
- 4) Use chemical control products including biological products. Standing water areas can be treated with a biological larvicide. *Bacillus thuringiensis israelensis* (Bti) or *Bacillus sphaericus* (Bs) are naturally occurring soil bacterium that control mosquito larvae by disrupting the gut receptors and causing the larvae to stop eating and die. Some trade names are Mosquito Dunks, Bactismos, VectoLex, VectoBac and LarvX. Biological larvicides are safe to use in water of livestock troughs. There also is an insect growth regulator called Methoprene that mimics the growth-regulating hormone and prevents normal development of larvae. Some trade names are Altosid, Bayer Advanced Garden Mosquito Preventer and PreStike. Malathion is one of the more commonly used insecticides for control of mosquitoes in pastures. A botanical insecticide available for mosquito control in pastures includes the active ingredient pyrethrum (Pyreth-It or AquaHalt). However, any insecticide used to control mosquitoes will only result in temporary relief (3-7 days), due to the fast life cycle of mosquitoes and their ability to fly and move around more than 20 miles. Always read, understand, and follow the pesticide label.



Ag Alert

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June 12th Through June 17th Weather Forecast

By: Daryl Ritchison—Asst. State Climatologist/Meteorologist

After a prolong period with the upper-level wind flow frequently having a southwesterly component over the Northern Plains, in the past few days that mean flow has been more from the west or northwest allowing for a break in the heavier precipitation. As low pressure systems move in from the southwest they have a longer period of time to pull Gulf of Mexico moisture into the area. A high percentage of the widespread heavier precipitation events that North Dakota and northwestern Minnesota receive, in any season, can be attributed to storm systems coming in from the southwest.

In the near term, the main storm track will be south of our immediate area. Southern South Dakota, southern Minnesota and points south in Nebraska, Iowa and southern Wisconsin could record excessive rain amounts from a series of thunderstorms expected in those locations. Although southern North Dakota in particular may record some rain from that system, amounts look very light. Otherwise, little if any precipitation is expected until Sunday.

This weekend, a large high pressure ridge in the Jetstream is expected to develop over Alaska (warm air surge) that will force a cold front through North Dakota Saturday Night into Sunday. Not only will that front bring below average temperatures into the region early next week but also trigger some hit and miss thunderstorms. As that ridge intensifies in Alaska, an area of low pressure should form in the Pacific Northwest, dig into the Rocky Mountains then move into North Dakota in the Tuesday/Wednesday time frame. Because this will redevelop the southwest flow previously mentioned, that projected storm will have heavier rain potential, plus a prolong period of clouds, cooler temperatures, and high low level relative humidity if it develops as expected.

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