Insect Watch
Sarah Kenyon

Will we have armyworms this year? Currently, there are no significant counts for the monitoring traps. However, true armyworms are unpredictable and their distribution has no set pattern from year to year. Therefore, it is important to scout for this pest periodically.

True armyworms migrate with the assistance of strong winds and storm systems, which carry them from southwestern portions of the country into more northeastern regions. The threat of true armyworm infestation increase when storm systems follow this pattern.

If the following conditions are present during spring, armyworms could cause economic damage: 1) high numbers of true armyworm moths, 2) cool, wet weather, 3) lush growth of grasses (especially tall fescue) and 4) lack of beneficial insects.

IDENTIFICATION: True armyworm moths have grayish-brown to tan colored forewings, with a white spot located in the center of each forewing, and grayish-white to pale hindwings.

Larvae are almost hairless with smooth bodies. Small larvae are often pale green in color, but change to yellowish-brown or tan bodies with tan to brown heads mottled with darker brown patterns. Three distinct broad, dark stripes run the length of the body with one occurring on the back and one running down each side. Additional orange lines can be found running the length of each side of the body from head to tail.

Look for four pairs of abdominal prolegs in the center of the body and a single pair of anal prolegs at the tail end of the larva. Each abdominal proleg will have a dark brown to black triangle located on the foot; few other larvae possess this characteristic (Figure 1).

True armyworm larvae hatch from spring laid eggs and rapidly grow through about seven or more worm stages (instars) as they develop from egg to adult moth. The early instars avoid light and spend much time close to the soil surface and on lower plant foliage. When scouting, look for small larvae under plant debris during late afternoon, evening, and early morning hours. As the larvae increase in size, they will feed during both night and day periods and move upward on host plants as they consume foliage.

Figure 1. True armyworm are identified by the triangles on each of the abdominal prolegs. Source: Iowa State University Department of Entomology

When to treat: Treatment is justified when an average of 4 or more half-grown or larger worms (one-half inch to one and one-half inch larvae) per square foot are present during late spring and before more than 2 percent to 3 percent of seed heads are cut from stems in tall fescue seed fields. Mustang Max or Warrior II are recommended to control armyworms at threshold levels.

Scout fields at least two times weekly to determine if larval numbers and damage are increasing to intolerable levels. True armyworms cause destruction of plant foliage and cut seed heads to fescue pastures. Heavy infestations may defoliate and consume 100% of the grass foliage and seed heads and then move to adjoining grass pastures before continue feeding and eventually reaching maturity.

Heat Stress in Cattle
Ted Probert

Heat stress is a factor that significantly affects the comfort and productivity of cattle. With summer approaching, now is a good time for producers to evaluate how effectively their herd management addresses the issue of heat stress for their herd.

All cattle are affected by elevated temperatures and will respond favorably to efforts to keep them comfortable. That said, lactating dairy cattle are the most vulnerable to stress associated with high heat and humidity. This discussion will be slanted toward milk cows, but the basic concepts of heat stress abatement apply to all classes of cattle and other livestock as well.

When does heat stress occur? Cattle are most comfortable when temperatures range between 25 and 65 degrees Fahrenheit. As the temperature rises above this level cattle slowly begin showing signs of heat related stress. The higher the temperature rises the more severe these symptoms become. Humidity also plays a role in the severity of heat stress. The two factors of temperature and humidity acting together ultimately determine the degree of discomfort cattle endure at any given time. Figure 1 illustrates the level of heat stress cattle are subjected to under various combinations of heat and humidity expressed in a temperature humidity index. The closer the THI gets to 100 the higher will be the level of heat stress.

What are the signs of heat stress? Cattle under heat stress exhibit several physiological and behavioral changes including increased respiration rate, elevated body temperature, reduced feed intake, and decreased milk production. Additionally, volatile fatty acid production in the rumen is altered resulting in the possibility of acidosis and lowered butterfat test. Heat stress can also have a significantly decrease conception rates, thus lengthening the herd’s average calving interval.

What can be done to prevent or alleviate the impacts of heat stress? Strategies for battling the effects of
hot weather come under two basic categories: ration/ nutritional management and cow cooling. Nutritional management strategies: As mentioned previously, heat induced stress causes lowered feed intake. Anything that can be done to prevent or circumvent lowered intake will be a positive move toward heat stress abatement.

Use of nutrient dense feeds is very important during the heat of summer. Use of high quality forages will reduce heat produced during digestion and offer more nutrients per unit of intake. Altering the proportion of forage to concentrate in the ration and adding extra fat are other strategies for increasing nutrient density. It is important when making these adjustments to remember that the cow has a requirement for fiber level in her diet. NDF needs to be maintained at a minimum of 28-30% of total ration dry matter and ADF needs to be at least 18-20% of ration dry matter intake.

Feeding most of the ration during cooler parts of the day will minimize digestive heat production and improve intake. More frequent feeding will help compensate for feed deterioration when silage is a ration component. Pasture fed cattle will benefit when allowed to graze in shaded pastures during the heat of the day. Non-shaded pastures can be utilized at night.

Cows lose minerals through sweating. This is more pronounced during hot weather. Appropriate ration levels of some important minerals during periods of heat stress include potassium (1.50%), sodium (.50-.60%), and magnesium (.30%).

Cows increase their water intake during hot weather. Adequate water availability is extremely important during this time of year. Keeping water fresh and as cool as possible will encourage intake and help cool cows. Cows will drink more if they don’t have to walk too far to their water source.

A final consideration on nutritional management would be the effect that feeding endophyte infected fescue can have on cattle during hot weather. Remember that the ergovaline present in infected fescue causes constriction of blood vessels, reduction of blood flow, and reduced heat dissipation. This situation will increase the stress that cows are subjected to during hot weather, further intensifying all the problems they endure when under heat stress. Substitution of alternate forages in place of fescue during hot weather will make a significant impact toward combatting heat stress.

Cow cooling strategies:

- Shade is the first thing to address when designing cow cooling systems. Shade will reduce the animals’ exposure to solar radiation and as a result the amount of heat they absorb. The most important areas for providing shade include holding pens, feeding areas, and resting areas. Shade can be provided naturally (trees), by permanent buildings, or by portable structures. Shade cloth can provide an inexpensive means of shielding cows from the sun. Plans for portable shades are available from your local MU Extension office.

- Fans – Addition of fans in shaded areas will complement the benefits provided by shade. Fans are useful for increasing air movement around cows. Two areas where fans are beneficial are in the holding pen and where cows rest. The latter application is most appropriate where cows have access to a housing structure such as a free stall barn. Fans should be located so they will move air over the top of the cows. They should be operated any time the temperature exceeds 70 degrees Fahrenheit.

- Sprinklers are the third component of the most effective cow cooling systems. Sprinkler systems offer the benefits of cooling the air around cows as well as cooling cows directly through wetting them then allowing the water to evaporate from the cows’ skin. Sprinklers should be used in conjunction with fans to create an environment that combines the cooling effects of water and air movement working in tandem. The most efficient cooling can be accomplished by using a timer to sprinkle cows until their skin is wet then switching off the water and allowing air movement from fans to evaporate the water from the cows’ skin. These systems are very effective in housing barns on farms that have these facilities. On farms that do not have housing, the holding pen is the critical area to install fan/sprinkler systems. Cooling cows just twice daily where fans are beneficial are in the holding pen and as cool as possible will encourage intake and help cool cows. Cows will drink more if they don’t have to walk too far to their water source.

If you would like further details on installation of heat stress relief systems or if you would like assistance in designing a system for your farm, you can feel free to give me a call.

Figure 2. Temperature Humidity Index (THI)\(^1\) for Dairy Cows. Modified from Dr. Frank Wierama (1990), Department of Agricultural Engineering, The University of Arizona, Tucson, Arizona.

\(^1\)THI = (Dry-Bulb Temp. °C) + (0.36 dew point Temp., °C) + 41.2

If more than two cows out of 10 have respiratory rates exceeding 100 breaths per minute, then immediate action should be taken to reduce heat stress.
Drip Irrigation Efficient, but Requires Careful Planning

Bob Schultheis

Drip irrigation is an efficient way to water vegetable and fruit crops, increasing crop yields 50-100 percent while at the same time reducing water use by 30-50 percent compared to other irrigation systems.

But careful planning and knowing available resources is critical to get a good system that meets your needs. You have to ask... How much water will the soil hold? How much water do the crops need? Is my water source adequate, reliable and of high quality? How much time do I have to work with the system?

Soils in southern Missouri typically store 1.5 to 2.5 inches of water per foot of soil depth, but because crop water use in summer can exceed 0.25 inch per day, a 2-foot deep soil only contains a 9-15 day water supply. Typical water intake rate of these soils is 0.2 to 0.7 inch per hour, so heavy rains may run off and not soak in enough to be available for the crops.

Crops under drip irrigation typically require a water supply capacity of 2-5 GPM (gallons per minute) per acre, compared to 4-7 GPM per acre for sprinklers.

A house well can sometimes be used to irrigate up to 2-3 acres of vegetables or fruits, in addition to supplying the household needs. But a larger pressure tank may be needed to avoid burning out the pump from excess cycling.

Drip systems operate at lower pressures (6-20 psi) than sprinklers (25-45 psi), thus requiring smaller pipes, pumps and energy demands. Other advantages with drip irrigation include less evaporation, less runoff and less weeds, plus the ability to apply fertilizers through the system, continue fieldwork while irrigating, and automate for around-the-clock watering.

A good filter with a 150- to 200-mesh screen is critical to prevent clogging of the water emitters, which dispense water at 0.5 to 2 gallons per hour. A well is preferred over a stream or pond for a water source, because filtering is less costly and not as prone to run dry in hot weather.

Proper system design involves getting accurate dimensions and elevations of the field, distances to water and power sources, crops to be grown, row and plant spacing, and hours of operation.

The water supply should be tested for pH, hardness and minerals to get the best results from chemigation through the system. The University of Missouri Soil Testing and Plant Diagnostic Services lab in Columbia can test water for irrigation suitability (see http://soilplantlab.missouri.edu/soil/water.aspx). For protection of groundwater supplies, check valves should be installed in the system to prevent back-siphoning fertilizers or pesticides into the water supply.

There is a bit of a learning curve to running a drip system profitably and efficiently. Most producers find that it takes one to three years of in-season experience to learn their system and the irrigation management strategies it offers.

For more information about drip irrigation, as well as a list of equipment suppliers, go online to http://extension.missouri.edu/webster/irrigation.aspx. Presentations on this topic can be found online at http://extension.missouri.edu/webster/pres-2014-02-19.aspx.

If you have questions on this topic or other engineering concerns, you can reach me at the Webster County Extension Center in Marshfield by phone at 417-859-2044, by email at schultheisr@missouri.edu, or go to our website at extension.missouri.edu/webster.

Determining Roof Hail Damage

Bob Schultheis

Spring storms can bring strong winds, tornadoes and large hail that damage home roofs. Be wary of out-of-town roofing companies that offer free roof inspections but leave you still wondering if your home has hail damage. That question is best be answered by an insurance adjuster, since all companies can have somewhat different standards. Insurance adjusters are usually looking for missing granules on the asphalt or fiberglass shingles, relative to the expected life of the shingles.

The number of dents in the metal roof vents is also a good indicator of hail amounts and size. The insurance company may have a formula, like 10 verified hail hits per 100 square feet, that determines their declaration for a roof replacement.

A hail hit on a shingle looks like a bruise or a dark spot where the granules on the shingle have been knocked off, exposing the asphalt underlayment and sometimes the fiberglass mat. New hail hits will have a shiny appearance, because the freshly exposed asphalt has not had time to weather to a dull color.

The best results for the benefit of the homeowner seem to be obtained when an experienced roofer walks through the inspection with the insurance adjuster and calls to the adjuster’s attention any damage that he/she sees.

For links to disaster-related resources from MU Extension, including publications, news, feature articles and videos, see http://extension.missouri.edu/n/2492.
European Union were for companion animals. How many of that stated that 37% of the pharmaceuticals sales in the industry in this regard. I read an article a few weeks ago given different antibiotics until one apparently worked. An antibiotic sensitivity test was not conducted. He was simply prescribed a series of three different very strong, broad spectrum antibiotics before he started feeling better. An antibiotic resistance in bacteria that cause diseases in humans. I don’t think that anyone can deny that antibiotic resistance is a problem. My wife is a nurse and has to battle antibiotic resistance of important bacteria has not changed. And most importantly, antibiotic resistance of important bacteria has not changed. My personal opinion regarding antibiotic use in our farm animals (and perhaps this is my take-home message) is that we must consider our consumers. Consumers are concerned about this subject. I recently heard that McDonald’s and Costco are going to purchase their poultry and meat from sources that respected these antibiotic restrictions. The old saying that “the customer is always right” may not be entirely true but the first law of economics indicate that you must have a market.

ANTIBIOTIC USE: Any of us that have raised farm animals for all or a portion of our family income know of the importance of antibiotics in maintaining the health, well-being, and productivity of our animals. However as my Grandpa used to say, “The times they are a changin”. We will continue to be able to use antibiotics to treat our sick animals, but there will be some changes.

In 2012, the Food and Drug Administration (FDA) issued the Guide for Industry 209 (GFI 209) that stated their intention to phase out the use of antibiotics (that are important in human medicine) in animal feeds or water for purposes of growth promotion. Fortunately, ionophores and bacitracin are not included in the GFI 209.

In 2013, the FDA issued the GFI 213 that will eventually prohibit the addition of antibiotics (that are important in human medicine) to food animal feeds on what is called an over-the-counter basis. Instead these additions will be under the prescription of a veterinarian, which will be called a Veterinary Feed Directive (VFD). Luckily, the FDA has allowed some time to institute these changes, December 2016. However it would be a great idea to discuss these upcoming changes with your veterinarian and prepare for them.

Some cattle producers have mentioned to me that on certain pastures and during certain times of the year, having chlortetracycline in their mineral mix is crucial to controlling footrot in their cattle. The way I interpret GFI 209, tetracyclines will be included in the VFD requirement. So it is imperative that producers prepare with their veterinarians.

All of these restrictions are focused on preventing antibiotic resistance in bacteria that cause diseases in humans. I don’t think that anyone can deny that antibiotic resistance is a problem. My wife is a nurse and has to battle with MRSA. Now there is a carbapenem-resistant enterobacteriaceae. Most humans who become infected with this bacteria have only a 50/50 chance of survival. The question has always been who is responsible? Of course there has been an abundance of finger pointing and animal agriculture has received more than its fair share of attention (blame). However, human medicine is not without blame. My son had pneumonia this past winter and was prescribed a series of three different very strong, broad-spectrum antibiotics before he started feeling better. An antibiotic sensitivity test was not conducted. He was simply given different antibiotics until one apparently worked.

Sometimes we forget the pet or companion animal industry in this regard. I read an article a few weeks ago that stated that 37% of the pharmaceuticals sales in the European Union were for companion animals. How many of you have had a cat on carbapenem for a urinary tract infection?

Another article stated that an ordinance had been proposed in the city of Chicago that banned the sale, barter, exchange, or give away of any food coming from animals that had been administered “medically important antimicrobials” for a nontherapeutic use. The ordinance also states that since the Danish ban on antibiotic use in food animals there had been no increase in animal morbidity or mortality and that there had been only slight increases in production costs. The truth is that 10 years after the antibiotic ban, veterinary prescription use of antibiotic has doubled. Consequently, antibiotic use before and after the ban has remained the same. In addition, mortality has actually increased significantly. And most importantly, antibiotic resistance of important bacteria has not changed.

My personal opinion regarding antibiotic use in our farm animals (and perhaps this is my take-home message) is that we must consider our consumers. Consumers are concerned about this subject. I recently heard that McDonald’s and Costco are going to purchase their poultry and meat from sources that respected these antibiotic restrictions. The old saying that “the customer is always right” may not be entirely true but the first law of economics indicate that you must have a market.

Upcoming Events

May 20—Canola Field Day: Learn about growing canola in southern Missouri and methods for extracting the oil. The goal of this workshop is to offer information that may provide additional farm income. The farm tour begins at 1:00 at Collins Farm at the intersection of CR 8800 and 8470.

July 30-Aug. 8—Ozark Empire Fair Hay Show, Springfield, MO. Contact your county MU Extension Center for entry details.