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Veterinary Entomology

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Insect Updates

Stable Flies! – Not only a Dairy Pest, but Mostly a Dairy Pest

Stable flies, also known as Heel flies in the dairy industry (which is not what an entomologist will call them), are a significant pest that cost the US cattle industry close to $1 billion each year, due to reduced milk production in dairy cows, decreased weight gain in beef cattle, and lowered feed efficiency.

Controlling for stable flies on a dairy is difficult, costly, time consuming and most of the time ineffective with chemical applications, but completely necessary.

To achieve any type of control on dairies (or beef pastures), sanitation needs to be your number one priority.

The stable fly larvae do not breed in fresh manure, like house and horn flies do. The stable fly prefers to breed in hay/straw/vegetation that is mixed with manure and urine.

The stable fly also does not need a large amount of breeding material in order to lay eggs and the larvae will develop inside the material where it is moist.

The ideal location for this material is up against the walls where animals feed or in between the rails.

Attempting to control stable flies with feed additives or spraying chemicals on the animals is usually ineffective. Chemicals on the legs (where the flies bite) get washed or rubbed off or does not maintain effectiveness long enough to effect most of the population. Feed additives are very effective against horn and house flies.

Both male and female stable flies take blood meals BUT they only take 1 meal EACH DAY. This comes out to be 3-5 mins every 24 hours on the animals' legs.

Cleaning up manure, feed, and hay on a regular basis and using biting fly traps are the most effective means of lowering a stable fly population.

The Virus vs. the House Fly

USDA-ARS scientist have found an alternative way to kill house flies and is utilizes a virus – salivary gland hypertrophy virus (SGHV).

This virus gets into the salivary glands of the female house fly causing them to swell and preventing her ovaries from developing. Therefore she cannot lay eggs and infected males cannot mate.

When the flies feed, they leave massive quantities of the virus behind for the next fly to consume.

Currently tests are being done to determine how to infect house flies and other flies are being tested against the virus (i.e. stable flies) with promising results.

The use of this virus will not be a "quick fix" but it will be another tool in the integrated management of flies.

Stink bugs in cow feed do not taint milk

With the recent infestation of marmorated stink bugs in many of the crops being harvested for dairy cows, some were concerned that the stink bugs would taint the milk.

USDA researchers studied cows fed contaminated feed and cows that were stink bug odor compounds in their stomachs with the results showing no signs of stink bug stench in the cow's milk supply.

17-year cicadas

This year the 17-year cicada will emerge in the eastern US, just as soon as the soil temps reach 64 degrees.

Although I can assume most people will not be as excited as entomologists will when billions of cicadas start singing, this will be an event to remember.

The magicicadas have red eyes and in some places there will be wall-to-wall cicadas.

Their presence will be felt for a few weeks before the adults die off after their offspring enter the soil to grow for another 17 years.

"if you can't weigh each animal and dose based on that, calculate your dose based on the heaviest animal in the group, not the group's average weight."

Cattle Care

It is spring (or summer in some locations), Time to Deworm

Spring has arrived and now it is time to deworm your cattle. Parasite burdens will peak during spring in pastures and again in the fall.

Many times internal parasites will be over looked since cattle do not always show clinical signs (rough coats, anemia, and edema) of an infestation. Many animals will experience reduced weight gain, decreased milk production, lowered conception rates, etc.

Most mature cows usually only need to be dewormed once per year, right before calving if possible, but two treatments in a might be necessary if there is a large parasite load.

Bulls are more naturally more susceptible to parasites and should be treated in the spring and fall.

Calves need to be treated at 3-4 months of age, at weaning, and every 3-4 months until they reach 1 year of age (this will vary based on parasite levels in the pasture). Yearlings can be dewormed in the spring and fall until they reach maturity.

There are two main classes of dewormers; benzimidazoles and avermectins/milbemycins, the later provides some external parasite control. When choosing a deworming product, keep in mind its spectrum of control, withdrawal time, cost effectiveness, product efficacy and method of application.

Parasite control on DocTalk

http://www.bovinevetonline.com/newsletter/bovinevet-wir/Parasite-control-on-DocTalk-207384111.html

On the DocTalk program, Kansas State University veterinarian Dan Thomson discusses parasite control with Dr. Dave Rethorst, also a K-State veterinarian. Rethorst outlines the importance of pre-weaning treatment for internal parasites in calves this spring, as well as spring control of internal parasites in yearling heifers and young cows. He also discusses the types of products appropriate for use in controlling internal parasites and external parasites, which are the primary concern in older females.

Proper injection sites when working calves

Now is that time of year when producers will schedule the "working" of their calves. Proper injection administration is a critical point in beef production and animal health.

No matter which product is being injected into the calf, there is always a negative relationship between meat tenderness and the injection site.

In fact, all intramuscular (IM) injections will create permanent damage regardless of the age of the animal at the time of injection. Tenderness is reduced in a 3 inch area surrounding the injection site.

All injections should be given in the neck when possible to stop damage to expensive steak cuts.

Always give injections according to the label and if there is an option to inject either subcutaneous or intramuscular, always choose subcutaneous.

Guard Against Heat Stress in Cattle

Understanding and avoiding heat stress can be a valuable management tool. According to Brian Freking, OSU Cooperative Extension Southeast District livestock specialist, "Cattle have an upper critical temperature that is approximately 20 degrees Fahrenheit cooler than humans."

At 90 degrees, cattle may be in the danger zone for extreme heat stress.

Humidity is an additional stress that intensifies temperature problems by making it harder for the cattle to cool off.

Signs of heat stress include slobbering, heavy panting, open mouth breathing and lack of coordination. Severe cases may include depression and trembling that require some type of low stress intervention.

If water is to be applied to cattle, the droplet sizes need to be large, misting water does not reach the hide and only adds humidity to the breathing environment.

Avoiding heat stress can be achieved by allowing cattle access to cool water and mineral supplements.

Increase watering locations if possible, to allow the herd to spread out and remember cattle will drink 50% more water in temps above 90°F.

Pesticides Update/Outlook

Insect/Weed Control Recipe Could be Hazardous to Corn

Many farmers have started to use soil insecticides (again) to insure that corn rootworms will not be a problem in corn fields.

But this has some setbacks, one of which is using herbicides later in the same field.

The use of both an organophosphate insecticide, such as Counter, Thimet, Lorsban, Aztec or Fortress, and an herbicide that is ALS or HPPD-inhibiting can cause injury to the plant.

Both insecticides and herbicides are foreign to corn plants and need to be metabolized by the plant. When ALS & HPPD herbicides and OP insecticides are used the plant can become overwhelmed and injury can occur.

It is important to follow label restrictions to prevent such interactions.

Human & Animal Disease & Health

TAHC Testing Equine for Piroplasmosis in Kleberg County, TX

Texas Animal Health Commission (TAHC) has designated south Texas, Kleberg Co. equine (horses, mules, zebras, etc.) at high risk for exposure to Equine Piroplasmosis. Testing of animals began on April 8.

Equine Piroplasmosis is a blood-borne protozoal disease that affects all equine, including horses, ponies, donkeys, mules and zebras. Piroplasmosis can be transmitted from a positive horse to a negative horse by blood transfer from dirty instruments or insect carriers, such as ticks.

Piro is not transmissible to humans. Piro is currently not considered endemic in Texas or the US but isolated outbreaks of the disease have and do occur.

Through research, a treatment protocol was developed that clears the infection and can lead to the release of horses that eventually test negative.

"Equine Piroplasmosis is considered a foreign animal disease in the US, however, new cases continue to be discovered, even three years after the initial case was found," Dr. Dee Ellis, State Veterinarian, said. "The TAHC is asking for the support of equine owners and veterinarians to make this testing effort a success and help assure the health of the equine population."

Horse has Parasites, Now what do you do?

Horses can get parasites and treatment is needed.

Reduce parasites by removing manure from stalls on a regular basis. Do not spread the manure into a field that the horse will have access to.

Worming a horse with medications approved by a veterinarian will manage parasites. Wormers come in pastes, gels, powders, granules or pellets.

Purge wormers will kill parasites with one strong dosage and will be given periodically with a veterinarian's recommendation. These can be given every 8-12 weeks but they do not stay in the body for more than a few days.

Continuous wormers, also known as "daily" wormers, are added to the horse's feed each day and destroy worms as they infect the horse.

Mastitis Monitoring and the Role Diet Plays in Heifer Mastitis Control

Monitoring mastitis rates and events is common place on dairies and necessary. A veterinarian must combine the health of the cow, ability of the farm personnel to identify disease and the most prevalent presentation of the disease.

In terms of identifying disease, case definition on a dairy is a way of defining to the farm personnel what constitutes an intervention point.

Monitoring systems should be kept simple and concise for farm personnel. Case definitions defined for a dairy may not be text book definitions but when defined simply and treatment protocols are defined around the case definition, the health of the animal is usually improved and goals for the dairy are more often met.

Mastitis management is commonly focused on lactating cows but the prevalence of mastitis in unbred, breeding age and pregnant heifers is higher than formerly realized, according to Stephen Nickerson, PhD, professor of lactation physiology, University of Georgia.

Dr. Nickerson says the goal should be to prevent new infections through management strategies that include not only vaccinations, use of teat seals and fly control but also dietary supplements that boost the immune systems.

"*The greatest development of milk-producing tissue in the udder occurs during the first pregnancy, so it is important to protect the heifer mammary gland from pathogenic microorganisms"*

Special Topics of Interest

Six Things Mom Get Wrong at the Grocery Store

According to a new survey of more than 1000 mothers many are often misinformed at the grocery store, especially when buying "all-natural" and "hormone-free" products.

Among the misconceptions, many moms:

Are willing to spend more for hormone-free poultry and pork, however, the USDA prohibits farmers from using hormones to raise these species.

Reach for "all-natural" products, *Consumer Reports* covered the issue in 2008, suggesting that not all natural ingredients are benign.

Think that family farms are dying, 7 out of 10 moms think this. Between 96-98% of the 2.2 million farms across the US are family farms.

Incorrectly identified organic production, 84% think organic food is farmed without the use of any pesticides, fertilizers or herbicides and half think organic is nutritionally better. Current evidence does not support any nutritional benefits or deficits from eating organic compared with conventionally grown foods. Same goes for milk.

Fear GMOs, modern biotech crops have been commercially grown for more than 12 years and there are no documented cases of an ecosystem disturbance or a person made ill.

Believe that local is better, in some situations it can take more energy to grow and harvest local food than it does to grow far away and ship.

Economist: Livestock Producers Should Expect Bright Future

According to Purdue University agricultural economist Farzad Taheripour, the livestock industry should see a boost in the coming years from more efficient land use, a stalled demand for corn ethanol and increased demand for meat in developing countries.

"Due to consumer taste preferences, global growth in income and population, the livestock industry will grow, particularly toward poultry and pork," Taheripour said. "The demand for poultry and pork will increase significantly."

Economists are wondering if beef prices will rise to the point that consumers will see it as a luxury good and choose alternatives such as chicken, pork and fish.

It was recently reported by USA Today that beef prices have increased by an average of a dollar per pound since 2007 and are expected to increase by up to an additional 10% before the summer.

Grocers and restaurants will be searching for ways to maintain consumer demand. Restaurants have previously avoided passing on high food costs to consumers by serving smaller portions but that might change.

Mike Hoffman, meat director at Dahl's Foods in Des Moines, has adopted the strategy of selling higher-priced beef cuts in 12 oz packages instead of 16 oz. He has also started selling smaller, cheaper cuts for $4 to "keep costumers' taste for beef alive."

Are Your Cows Overstocked?

Research has found the negative impacts of overcrowding cow pens effect not only the performance but also the physiological and behavior of animals. The losers of competition over quality feed will hold back profitability of the whole herd.

Overcrowding leads to stress and this will increase cortisol production in cows. The increased cortisol may change energy metabolism and result in higher non-esterified fatty acids levels.

Researchers also found that some cows will compensate overcrowding at the feed bunk by consuming feed at a faster pace and some will lie down at the expense of spending time at the feed bunk. Other cows have been noted to butt heads at the feed bunk as well.

Management needs to be changed to reduce the impacts of overcrowding; frequent feeding, push up feed, more frequent scraping of manure and good bed maintenance should be priorities.

New School Lunch Beef Recipes with Approval from Kids, Foodservice

New beef dishes have been piloted at schools around the country and many students and foodservice directors agree the meals are delicious and nutritious.

The dishes are The Rock and Roll Beef Wrap, Spy Thai Beef, Sweet Potato Beef Mash-Up, Wrangler's Beef Chili and Sweet and Sloppy Joes.

The most common response from students was "Awesome." Spy Thai Beef, Asian themed ground beef with veggies – "I love Thai food and this was delicious."

Wrangler's Beef Chili, classic ground beef and bean chili recipe – "We want seconds!" "Yummy lunch!"

Sweet Potato Beef Mash-Up, sweet potatoes and ground beef – "I like the meat and veggie mixture!"

Insects. They're What's for Dinner!

One potential remedy for the rapidly growing world population, according to a United Nation's Food and Agriculture Organization (FAO) report, is edible insects.

"Insects offer a significant opportunity to merge traditional knowledge and modern science in both developed and developing countries," according to the FAO report.

Many insects contain the same amount of protein and minerals as meat and more healthy fats.

It is estimated that 2 billion people eat insects already.

FAO report also touts edible insects as a way to fight obesity and lower greenhouse gas emissions, while providing business and export opportunities for poor people in developing countries.

April Temperatures Coldest in 16 years

The National Oceanic and Atmospheric Administration (NOAA) released its monthly "State of the Climate" report, showing that April was the 23rd coolest April on record and also the 19th wettest.

Temperatures across the nation averaged 49.7 degrees F, making it the coolest April since 1997. The precipitation averaged 2.9 inches.

The Midwest felt the impact of the lingering winter conditions, more than most areas. Cool weather and wet conditions delayed planting for weeks, which at one point tied 1984 for the slowest planting season reported.

The Upper Midwest had so many alfalfa crops killed by the cold that the start to spring has forced some livestock producers to replace crops with other grains or pay high prices for more hay.

Not all regions were so lucky with the rain, parts of Cali and the Southwest saw little rain and above-average temperatures.

Journal Reviews

Identification of volatile compounds from a food-grade vinegar attractive to house flies (Diptera: Muscidae). 2013. Qian et al. J Econom. Entomol. 106: 979-987.

Researchers in Nebraska used commercial vinegar to attract and trap house flies with successful results at a dairy.

The vinegar was mixed with brown sugar and captured more house flies than other attractants.

Electroantennograms showed that the seven vinegar components elicited significant responses from antennae of house flies.

This is the first detailed report of house fly attractants from vinegar.

The Impact. This will help develop less volatile attractants for use around barns and in indoor environments.

Repellency of cassia bark, eucalyptus, and star anise oils and their major constituents to *Leptotrombidium pallidum* (Acari: Trombiculidae). 2013. Shin et al. J Med. Entomol. 50: 579-584.

Researchers tested the repellency effect of cassia bark, eucalyptus and star anise oils against chiggers in South Korea that are known to vector the causative agent of scrub typhus.

Results showed cassia bark, star anise oils and the major constituents, (E)-cinnamaldehyde, 1,8-cineole, and (E)-anethole, to be more repellant than DEET and IR3535.

The Impact. The effectiveness of these essential oils and their major constituents provide hope in finding more natural compounds to use as repellents.

Evaluation of a nonanal-Trimethylamine lure for collection of *Culex quinquefasciatus* (Diptera: Culicidae) in gravid traps. 2013. Irish et al. J Med. Entomol. 50: 619-623.

An effective means for trapping *Culex quinquefasciatus* mosquitoes is with gravid traps that are infused with organic material.

The organic material changes overtime, altering its attractiveness, therefore standardized lures using nonanal and trimethylamine have been developed.

The researchers tested grass infused traps against, nonanal & trimethylamine traps and tap water traps.

Grass infused collected more mosquitoes than the other traps.

The Impact. These results show the lures to attract mosquitoes but not at the same numbers as the grass infused meht

Permethrin resistant profiles in a field population of mosquitoes, *Culex quinquefasciatus* (Diptera: Culicidae). 2013. Yang and Liu. J Med. Entomol. 50: 585-593.

The resistance qualities of natural populations of *Culex quinquefasciatus* were tested in the laboratory against permethrin and compared to a susceptible strain of mosquitoes.

The results showed fourth larvae to exhibit a resistance range of 0.4 to 280 fold. The researchers found 65% of the colonies to have <10 fold levels of resistance to permethrin, 16% had 10- to 20- fold, 7% had 20- to 30- fold, and 12% ≥ 30- fold.

The Impact. The extensive presence of resistance in natural colonies of *C. quinquefasciatus* is unsettling information when vector control is limited by the number of insecticides available for use.

Comparison of dragging and sweeping methods for collecting ticks and determining their seasonal distributions for various habitats, Gyeonggi Province, Republic of Korea. 2013 Chong et al. J Med. Entomol. 50: 611-618.

Dragging and sweeping methods were utilized and compared to determine their efficiency for collecting ticks in grass and deciduous, conifer, and mixed forest habitats.

Three species were collected, *Haemaphysalis longico, Haemaphysalis flava,* and *Ixodes nipponensis*.

Collection method was determined to have no significant difference when collecting for ticks but there were significant in the number of ticks collected based on location and time of year.

The Impact. The results of this paper show that if tick sampling is needed in an area for any reason, the same number of ticks will be collected whether with a sweep net of a dragging cloth.

Range expansion of *Dermacentor variabilis* and *Dermacentor andersoni* (Acari: Ixodidae) near their northern distribution limits. 2013. Dergousoff et al. J. Med. Entomol. 50: 510-520.

Researchers in Canada studied the known location of both ticks in Canada and increased the sampling plot in order to determine if either tick species had moved beyond the known habitation zone.

Dermacentor variabilis, the American dog tick, was found to have expanded westward and northward beyond the acknowledged habitation zone from 1960.

Dermacentor andersoni, the Rocky Mountain wood tick, was sampled as well and determined to have not moved beyond the habitation zone set forth in 1960.

The Impact. The expansion of the ticks and the overlap in location gives rise to the movement of disease transmission in areas not previously exposed and also gives potential of the ticks sharing disease pathogens.

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Aedes (Stegomyia) aegypti in the continental United States: A vector at the cool margin of its geographic range. 2013. Eisen and Moore. J Med. Entomol. 50: 467-478.

No doubt climate conditions directly impact many aspects of the life history of *Aedes aegypti*, the mosquito is also linked to the human environment and influenced by the availability of water-holding containers for oviposition and larval development.

Many fear that the mosquito will eventually move further north as the climate warms.

The Impact. This mosquito is the main vector of Dengue and Yellow Fever. Dengue has had recent outbreaks in southern Florida and southern Texas, locations where *Ae. aegypti* are found.

Repellency of DEET, picaridin, and three essential oils to *Triatoma rubida* (Hemiptera: Reduviidae: Triatominae). 2013. Terriquez et al. J Med. Entomol. 50: 664-667.

Triatoma rubida, the kissing bug common in Tucson, AZ, is responsible for causing severe allergic reactions in some individuals that are bitten.

The kissing bug, is named so for its tendency to feed on the face near the mouth.

Several products were tested for their repellency to *T. rubida*; DEET, picaridin, tea tree oil, peppermint oil, and citronella oil.

None of the materials tested were observed to have long range repellency. DEET showed a 10% repellency, picaridin 7%, tea tree oil 30%, peppermint oil 3.3%, and citronella 0.165%. Citronella was the only chemical able to stop all probing and feeding.

The Impact. The results of citronella give hope for repellency when sleeping.

Estimating mosquito population size from mark-release-recapture data. 2013. Cianci et al. J Med. Entomol. 50: 533-542.

Estimating accurate populations of mosquitoes is key to understanding the ecology of disease vectors, as well as the epidemiology of the pathogens they carry.

Population size can be estimated with mark-release-recapture experiments. These experiments are based on the total number of marked and unmarked captures

The Impact. It is impossible to collect all insects but when dealing with a disease carrying vector, the use of the MRR method would assist with population numbers; thereby helping decide if and when control measure should be taken.

Efficacy of DEET and non-DEET – based insect repellents against bites of *Simulium damnosum* vectors of onchocerciasis. 2013. Wilson et al. Med. Vet. Entomol. 27: 226-231.

Coping with *Simulium damnosum* in onchocerciasis endemic communities is done with smoke screens. But more efficient alternatives are needed.

DEET products and NO MAS (para-menthane-3,8-diol, and lemon grass oil) were tested in Ghana against the black fly vectors.

NO MAS had the highest percentage at 80.8% and 42.5% with DEET product. The period of absolute protection was 5 h by NO MAS and 1 h by 50% DEET product.

The Impact. Onchocerciasis or river blindness is a filarial disease caused by an *Onchocerca volvulus* infection transmitted to humans by black flies. The disease in the chronic stage manifests as blindness, severe dermatitis and skin depigmentation. Additional means for protecting susceptible individuals is heavily warranted.

Anthrax! Time to vaccinate is now!

Now is the time for livestock producers to get their animals vaccinated against anthrax.

"Conditions this year are conducive to the development of anthrax," warns Charlie Stoltenow, NDSU Extension Service veterinarian.

Although this is in regards to North Dakota and the rainfall it is receiving, vaccination is important for all livestock in areas with a history of anthrax.

Livestock should be vaccinated 4 weeks before the disease usually appears.

Herds within 6 miles of prior cases should be vaccinated, especially in wet years. Livestock need to be vaccinated annually for anthrax.

"The vaccine is inexpensive and very effective," Stoltenow says. If anthrax is detected, a herd should be moved to a new pasture.

Livestock/veterinary website
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