

Special Interest Articles:

- The Kissing Bug
- Mosquito Attractions
- The Demise of Flies
- Pet Spot-On Pesticides
- Parasites of Heifers



Individual Highlights:

- Insect Updates 1
- Cattle Care 2
- Pesticides 3
- Disease/Health 3
- Journal Review 4

Insect Updates

Kissing Bugs – Triatominae



The spot-light insect for this edition of the newsletter is a little known “Bug” to those living in the US that are not entomologists. Until my return to work this week I had never seen one collected locally.

The kissing bug is in the family Reduviidae of the order Hemiptera. The members of this family are blood-sucking insects that feed at night on humans and animals.

They get their name from their tendency to feed on the face, typically near the mouth while the unsuspecting host is sleeping.

These bugs in most parts of

Central and South America are vectors of the parasite *Trypanosoma cruzi*, which causes Chaga’s disease.

Chaga’s disease develops in two separate forms, acute and chronic; and is fatal in the latter form. Typically the disease is contracted by people living in very poor conditions of very poor countries.

So you are all probably wondering why I am talking about this insect. This week I received one courtesy of Dr. Forrest Mitchell and it got me thinking that few know about this bug and what implications it can have. Dr. Mitchell has

seen and collected several in his yard in Stephenville, TX, making it possible for many others in various areas of TX to have this bug.

Although the parasite *T. cruzi* is not prevalent in the US, it has been found in southern TX where it is being transmitted to dogs by the kissing bug.

The reason why the kissing bug is the insect of interest is it is found throughout TX and FL and cases of Chaga’s disease are being found in southern TX in dogs. So keep your eyes open for them and if you travel south, protect your dogs from them.

Mosquito Attraction

ARS scientists have determined in greater detail how *Aedes aegypti* the yellow-fever-transmitting mosquito detects the specific chemical structure of octenol. This

compound is used to find a mammalian host for a blood meal.

By learning more about the attraction to octenol, scientists get one step closer

to developing better mosquito repellents and traps. In addition, more is learned about how mosquitoes sense the world around them.

Beer Loving Mosquitoes

Anopholes gambiae (the mosquito that transmits malaria) tracks its victims by their smells. An experiment that wafted human aromas over thousands of mosquitoes found that the body odor of beer drinkers was quite tantalizing.

Results showed increased proportions of mosquitoes to a person 15 minutes after

chugging a liter of beer.

What is it about a beer drinker that is so appealing?

No one knows.

Something about the beery body odors attracts the mosquitoes. It is believed that mosquitoes are drawn to a slew of chemicals being released. It is yet unknown if

these chemicals are beer specific or common to all alcoholic drinks.

Not all humans are made equal in the eyes of a mosquito, they are very picky. Therefore it is important to figure out what makes one person a delectable feast and another person a bloody turn-off.

Cattle Care

Plan the Demise of Flies



“Large populations of bloodthirsty stable flies can reduce milk production in lactating herds by 15 to 30 percent.”

Winter is over and the flies are here, in some areas they are here in full force and it is only the end of May. It is time to initiate an integrated pest management (IPM) program that will effectively manage these fly populations.

In dairy operations the two primary species of concern are house flies and stable flies.

House flies breed throughout the facility and have a turn-over of 10 to 14 days. Females lay 150 to 200 eggs and 1 lb manure can contain more than 1500 maggots. It is important to break their life cycle in order to take control.

Stable flies look like house flies in appearance but they bite, hard! They can lead to reduced milk production when large populations form.

4 components of IPM for fly control:

1. **Cultural Control** – effective sanitation practices to keep the environment clean and as dry as possible.
2. **Biological Control** – insect predators and parasites help reduce fly larvae and pupae populations. These are available naturally or can be purchased (parasitoid wasps).

3. **Chemical Control** – there are a wide variety of products available, read the label first and follow all the regulations.
4. **Physical Control** – tapes, traps and lights are forms of physical control aimed at attracting and killing the adult fly. This method is best for areas where chemicals cannot be used.

For the best results, all IPM components should be used together to ensure effective control measures.

Biological Fly Control

The key to fly control is manure management; there must be a sufficient system in place to manage manure in order to control flies.

Steps to reduce fly numbers:

1. Keep undisturbed manure as dry as possible
2. Scrape empty pens, alleyways, and fence lines to remove manure
3. Clean up spilled feed, decaying hay and silage
4. Control weeds to remove fly resting areas

Next step is to consider releasing parasites (i.e. parasitoid wasps) to help reduce fly numbers in properly managed manure.

Combating the Hazards of Horn & Face Flies

With the summer heat comes the invasion of troublesome flies such as horn flies and face flies.

Both species can wreak real economic damage on cattle production, especially calves and stockers. Fly control is crucial.

Horn flies can be controlled with pesticides applied to the

back and/or using ear tags and feed-thru products. (See the last edition of Veterinary Entomology Newsletter to learn more).

Face flies do not bite but cluster around the eyes and nose of cattle where they feed on the tears, saliva, mucus and blood. They irritate the cattle and can transmit the bacterium that

causes pinkeye.

Calves with pinkeye sell for \$10-\$12 less per hundred weight than healthy calves.

Many pesticide products marketed for horn flies will also control face flies.

Protect Calf Health with Biosecurity

Steps to take on the farm:

1. Raise calves individually, prevent feces transfer between calves. Limit worker access within calf housing.
2. Work calves youngest to oldest since older calves harbor more pathogens.
3. Workers touching secretions such as saliva and feces
4. Sanitize bottles and nipples (or buckets) between feedings, scrub with brushes to clean adequately.
5. Waste milk is high in

6. pathogen load, pasteurize correctly before using. Not recommended to use mastitic milk.
7. Flies and vermin are transmitters of pathogens and must be controlled. Proper and swift removal of dead calves.

Pesticides Update/Outlook

EPA takes action to establish new bug bomb labeling

EPA is taking action to improve residential safety and reduce risks associated with bug bombs, or total release foggers (TRFs). The Agency is calling for significant changes to their

labeling to address the most common causes of exposure incidents associated with TRFs.

To draw attention to critical information, future bug bomb

labels must be written in plain language with clear headings, improvements, including transitioning to smaller foggers, time-delayed release, and nonflammable propellants.

Domino's Pizza, Inc's

New improved pizza campaign helps deliver a boost for slumping cheese prices.

Bt Control of Roundworms

Roundworms are very damaging to children outside the US. Therefore a scientist at UC San Diego was prompted to look at Bt as a control method for

roundworms.

Data shows resistance is forming to the common chemicals used to treat them. Bt (usually used for pest control

in crops) is being fed to animals (goats) and decreasing the number of adult roundworms by 70% and egg production of the worms by 98%.

EPA Evaluating Pet Spot-on Products

The EPA is pursuing a series of actions to increase the safety of spot-on pesticide products for flea and tick control for cats and dogs.

Immediately, EPA is reviewing labels to determine which ones need stronger and clearer labeling statements. They will also be developing more stringent tests and evaluation requirements for both existing and new products.

All steps are being taken in order to help prevent adverse reactions from pet spot-on products.

Collaboration with FDA is also occurring since they regulate some similar products.

EPA will continue to reach out to the public with the actions they are taking and will provide information that will help consumers use pet pesticide products safely. They are

committed to sharing information with the public and will be making reports from an expert team of veterinarians available.

Go to <http://www.epa.gov/pesticides/health/petproductseval.html> for more information on this new project.

I will keep you posted on spot-on products when new information is made available.

Human & Animal Disease & Health

Parasites can rob Heifer Growth

If your goal with a beef or dairy heifer is to reach a certain age and weight for the first breeding and conception, do not ignore the damage parasites can have in the process.

USDA NAHMS study showed 25% of operations never dewormed weaned beef heifers and only 55% of dairy heifers were actually dewormed. Beef and dairy heifers deal with the same parasite species. Parasites are being picked up in the pasture.

Timing means a lot in a young, growing animal. Dairy heifers should be dewormed prior to being exposed to parasites (pasture). It is good to deworm when they go out onto pasture or onto newly growing pasture. It is then good to deworm again in 8-12 weeks

Beef calves should be dewormed 8 weeks after turnout. It is effective to deworm the dams as well to keep the pasture clean for the calves. Another deworming may be beneficial when approaching

the end of the grazing season and again at turn out next spring.

Many stockers/replacements are being dewormed too many times (3-5) which is leading to resistance and worm populations that are no longer susceptible to the dewormer.

Many times replacements are forgotten until needed and then they are not at breeding size. Replacements should be treated as an investment and vaccinated and dewormed accordingly.

Journal Reviews

Entomopathogenic fungal activity against pupae and adult *Haematobia irritans* (Diptera: Muscidae). 2010. Mochi et al. *Vet Parasitol.* 168:105-110.

This study compared the fungi *Metarhizium anisopliae*, *Beauveria bassiana*, *Isaria fumosorosea*, and *Isaria farinosa* on pupae and adult horn flies. Groups of fly pupae and adults were sprayed with fungi isolates in the

laboratory.

High concentrations of conidia caused death of pupae with *I. farinosa* being the most effective.

M. anisopliae and *B. bassiana* were

effective on adults at high concentrations but *I. fumosorosea* and *I. farinosa* were not.

The Impact. Alternative control methods that does not contain synthetic pesticides.

Acidification of calf bedding reduces fly development and bacterial abundance. 2010. Calvo et al. *J Dairy Sci.* 93: 1059-1064.

Sodium bisulfate (SBS), an acidifier that reduces the pH in bedding and flooring, reduces bacteria and immature fly development.

bedding and calf slurry (BED) was conducted to observe house fly larval reduction.

Overall, acidification of calf BED using the acidifier SBS resulted in a reduction

of bacteria and house fly larval survival.

The Impact. This form of fly control might reduce adult fly production and fly-related stress in calves.

The application of SBS to rice hull calf

The housefly, *Musca domestica*, as a possible mechanical vector of Newcastle disease virus in the laboratory and field. 2010. Barin et al. *Med Vet Entomol.* 24: 88-90.

Newcastle disease is a highly infectious virus shed in the feces of infected birds. Muscid flies contribute to disease transmission by visiting infected manure.

harbor Newcastle disease virus.

Laboratory reared house flies were exposed to NDV. The virus was detected in the dissected gastrointestinal tract for up to 72 h post

–exposure, untreated control were negative.

The Impact. House flies serve as mechanical vectors of Newcastle disease for up to 72 h, within that time they can travel several miles.

2000 house flies collected near poultry farms were examined their ability to

Comparative plasma disposition, bioavailability and efficacy of ivermectin following oral and pour-on administrations in horses. 2010. Gokbulut et al. *Vet Parasitol.* 170: 120-126.

Different ivermectin products compared (pour-on, paste and injectable) were applied to horses, weight and strongyle egg counts were taken for 10 weeks.

strongyle eggs 100% until week 7 and then 95-99% until the end of the study. IVM pour-on resulted in a mean reduction of 82-97% throughout the entire study period.

the development of drug resistance in parasites.

The Impact. All formulations of IVM work but the pour-on is the least effective, therefore allowing parasites to develop resistance. Although more convenient, the pour-on is not the best method for applying IVM.

Fecal strongyles were reduced by 100% for all weeks but the first after the IVM injectable. The IVM paste reduced

The lower bioavailability of IVM in horses treated with pour-on can lead to poor plasma concentrations that may promote

Treatment of horses with cypermethrin against the biting flies *Culicoides nuberculosus*, *Aedes aegypti* and *Culex quinquefasciatus*. 2010. Papadopoulos et al. *Vet Parasitol.* 169: 165-171.

The pyrethroid insecticide cypermethrin was tested *in vitro* on horses. Hair was collected and sprayed with Deosect, a Fort Dodge Animal Health product.

intervals.

For *C. nuberculosus*, mortality was close to 80% 7 days after treatment but declined gradually; mean mortality was still around 50%.

appeared to be less susceptible and the toxic effects declined more quickly.

The Impact. Potential for another topical insecticide treatment for horses against biting flies.

Culicoides nuberculosus, *Aedes aegypti* and *Culex quinquefasciatus* were then placed in contact with the hair at various

Ae. aegypti and *C. quinquefasciatus*

Effects of orally administered spinosad (Comfortis®) in dogs on adult and immature stages of the cat flea (*Ctenocephalides felis*). 2010. Blagburn et al. *Vet Parasitol.* 168: 312-317.

The efficacy and quickness of spinosad against adult fleas on dogs was evaluated.

and 48 h intervals. Mean flea counts were 53.7%, 64.2%, 85.8% and then 100% for the remaining checks.

month. Dogs were then checked for flea eggs. Spinosad was highly effective at reducing egg production 99.8% throughout the study.

Dogs were randomly treated with spinosad tablets, flea combs were performed at 0.5, 1, 2, 4, 8, 12, 24,

Another study consisted of dogs being administered tablets, then infested with 600 fleas at 3 h and then reinfested at 1

The Impact. Comfortis® appears to be a quick, effective method for treating for fleas on dogs.

Volatiles emitted from eight wound-isolated bacteria differentially attract gravid screwworms (Diptera: Calliphoridae) to oviposit. 2010. *J Med Entomol.* 47: 349-354.

Screwworm infested animal wounds were tested for attraction to gravid flies in varying bioassays.

when presented to the flies singly.

When all the 8 bacteria species were mixed together and presented to the gravid flies, the greatest amount of oviposition occurred.

The Impact. Screwworm flies use bacteria volatiles when looking for an oviposition site in addition to finding a site that will provide a bloodmeal.

Certain bacteria volatiles were found to be more attractive than others

Evaluation of housing as a means to protect cattle from *Culicoides* biting midges, the vectors of bluetongue virus. 2010. Baylis et al. *Med Vet Entomol.* 24: 38-45.

Experiments were set up to catch *Culicoides* with light-traps inside and outside four different farms in May June and October.

More biting midges were collected during the summer months than in October. The presence of cattle increased catches by 2.3 times and outside traps caught 6.5 times more insects.

The Impact. A simple change, like bringing cattle or other animals inside, reduces their risk of being bit and therefore catching diseases.

Detection of bluetongue virus RNA in field-collected *Culicoides* spp. (Diptera: Ceratopogonidae) following the discovery of bluetongue virus serotype I in white-tailed deer and cattle in Louisiana. 2010. Becker et al. *J Med Entomol* 47: 269-273.

An infection with bluetongue virus can cause serious hemorrhagic disease with high mortality rates in sheep and deer. Cattle and goats rarely show clinical symptoms. Five serotypes naturally occur in the U.S.

Louisiana. The authors then set out to trap *Culicoides*, the vectors of BTV, around the area and assay the virus' RNA to determine which serotypes were present in the insects.

serotypes). No insects were found that carried BTV-1 but they must be out there cause BTV is only transmitted by insect bites from host to host and several deer and cattle have been infected with BTV-1.

In 2004, the serotype BTV-1 was detected for the first time in deer from

The authors collected four different species of *Culicoides* and detected BTV-13 and BTV-17 in some of the (native

The Impact. The detection of BTV-1 in the U.S. means problems for deer from a different version of BTV that is fatal.

Evidence for role of white-tailed deer (*Artiodactyla: Cervidae*) in epizootiology of cattle ticks and southern cattle ticks (*Acari: Ixodidae*) in reinfestations along the Texas/Mexico border in south Texas" A review and update. 2010. Pound et al. *J Econ Entomol.* 103: 211-218.

Pound et al. have taken the time to summarize confirmational support for the role of white-tailed deer in the maintenance of cattle tick and southern cattle tick populations in

Texas.

Looking at historical accounts, circumstantial evidence from review of recent infestations, and cattle fever tick infestations on white-tailed deer live-

captured, verifies the deer's ability to maintain the tick population.

The Impact. Despite original belief, the cattle tick and southern cattle tick are found on other hosts besides cattle.

First report of the cattle tick *Rhipicephalus microplus* resistant to ivermectin in Mexico. 2010. Perez-Cogollo et al. *Vet Parasitol.* 168: 165-169.

Paper 1 – Field collected populations of the cattle tick from three different farms in Mexico were tested in the lab with ivermectin.

It was determined that all three populations were resistant to ivermectin. There were

also significant differences between populations indicating different levels of resistance to ivermectin.

Paper 2 – The study conducted in Brazil showed that after only ten generations in the laboratory resistance can be increased.

Selection of an ivermectin-resistant strain of *Rhipicephalus microplus* (*Acari: Ixodidae*) in Brazil. 2010. Klafke et al. *Vet Parasitol.* 168: 97-104.

The Impact. Resistance to ivermectin is being achieved by cattle tick populations thereby limiting the number of pesticides available for control of the cattle tick. But studying the resistance in a laboratory can help determine the mechanisms of and potential methods to control resistance.

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Rhipicephalus (Boophilus) microplus (Acari: Ixodidae) resistance to fipronil in Uruguay evaluated by *in vitro* bioassays. 2010. Castro-Janer et al. Vet Parasitol. 169: 172-177.

Rhipicephalus microplus were obtained from 4 local populations and tested for fipronil resistance. All field strains were correctly

diagnosed as fipronil-resistant.

The Impact. This study presents the first diagnoses of cattle tick resistance to

fipronil. It also highlights the importance of the possible conflict between programs to control agricultural pests and cattle ticks.

Efficacy of the fipronil 10% + (S)-methoprene 9% combination against *Rhipicephalus sanguineus* in naturally infested dogs: Speed of kill, persistent efficacy on immature and adult stages and effect of water. 2010. Brianti et al. Vet Parasitol. 170: 96-103.

Treatment dogs were treated with a spot-on formulation of fipronil and counted on days 2, 7, 14, 21 and 28 for adult and immature tick loads.

higher than immatures throughout. Efficacy for both adults and immatures ranged from 96.2% to 91.6%.

Water drenching occurred to

half the dogs but had no effect on the efficacy of the product.

The Impact. The fipronil product is highly efficacious to the brown dog tick even when the animal gets wet.

Adult tick kill was slightly

Detection of vector-borne agents in lone star ticks, *Amblyomma americanum* (Acari: Ixodidae), from Mississippi. 2010. Castellaw et al. J Med Entomol. 47: 473-476.

Lone star tick samples were collected throughout Mississippi and tested for the presence of bacterium that cause several human and animal diseases (*Ehrlichia chaffeensis*, *E. ewingii*, *Borrelia lonestari*, *Francisella*

tularensis, *Rickettsia amblyommii*).

Over 50% of the ticks tested carried one of the above bacteria.

The Impact. This study demonstrates *E. chaffeensis*,

E. ewingii, *B. lonestari*, and *R. amblyommii* in the lone star tick for the first time in Mississippi and these bacteria could be present in the populations of lone star ticks in Texas as well.

Host associations of *Dermacentor*, *Amblyomma*, and *Ixodes* (Acari: Ixodidae) ticks in Tennessee. 2010. Cohen et al. J Med Entomol. 47: 415-420.

The authors collected ticks from medium- to large-sized mammalian host and by dragging in 49 counties in Tennessee.

The most frequently collected mammals were raccoons which were commonly infested with *Dermacentor variabilis*.

The white-tailed deer contained the largest number of *Amblyomma americanum*. Small numbers of other tick species were collected from the animals throughout the counties.

The Impact. Many species of ticks are host specific and have the ability to move throughout the state. This is important due to their ability to transmit pathogens.

Forest and surface water as predictors of *Borrelia burgdorferi* and its vector *Ixodes scapularis* (Acari: Ixodidae) in Indiana. 2010. Raizman et al. J Med Entomol. 47: 458-465.

The authors studied whether the distribution of *B. burgdorferi*, causative agent of Lyme disease, and *I. scapularis*, the vector, across Indiana was influenced

by large-scale landscape features such as forests and water.

The Impact. After sampling killed deer

and tick collections and disease presence it was found that neither the forest area nor the bodies of water significantly correlated with Lyme disease.

Acaricidal efficacy of Ivomec (ivermectin) and Dectomax (doramectin) on sarcoptic mange mites (*Sarcoptes* spp.) of Arabian camels (*Camelus dromedaries*) in Saudi Arabia. 2010. J Entomol. 7: 95-100.

Camels are a high commodity in the Middle East but they are highly susceptible to sarcoptic mange. Spray and dip methods that control the mites are inefficient for the people of this region or too expensive.

looked at for efficacy and long term effects on the camels.

Doramectin was found to decrease sarcoptic mites significantly more than ivermectin and for a longer period (8 wks as opposed to 4 wks). But doramectin was found to cause

harm and long term affects to the liver and organs of the camels.

The Impact. The efficacy of doramectin is significantly higher for mites and other arthropod pests than ivermectin.

Livestock/veterinary website coming soon! It will be up by the end of summer.

<http://livestockvetento.tamu.edu>