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Veterinary Entomology

Special Interest Articles:

- Winter Pests
- Bacteria House Flies
- Mosquitoes
- Revised Trichomoniasis Regulations

Individual Highlights:

Insect Updates

Winter Pests

As many might have noticed Christmas is less than a month away now, and with that comes the cold/cool weather and winter pests.

One nice thing about winter is that fly control will not be top priority as long as we keep having these cold mornings and cooler weather in the day. The flies are still around and will be present during the day when the temperature gets up past 55ºF, but densities will be considerably less and the use of pesticides will not be warranted for pastured cattle.

Many people will start to use barns or stalls more frequently in the winter to help keep cattle warm, especially calves, and this is where fly problems will be an issue in addition to other jointed-leg critters (lice, ticks, mites).

Using barns/stalls in the winter is a great idea but it is necessary to keep them clean by removing manure on a weekly basis or more often. This will keep fly densities from rising to high and causing irritation to the cows as well as blood loss. Pesticides should not be needed for fly control in most parts of Texas in the winter as long as manure is managed properly.

Other arthropods that can be issue in the winter and will warrant pesticide usage are lice, mites, and ticks. Bringing the cattle together in close quarters helps them keep warm but it also helps them spread these pests much faster. Be sure all animals are lice, mite and tick free before mixing with a herd. If any of these pests are encountered, treat immediately.

Bacteria Carrying House Flies

Research at the University of Florida (conducted by two of my committee members) has found five more bacteria species that are carried by house flies. All of the newly identified bacteria on house flies are capable of causing illnesses such as food poisoning and respiratory infections in humans.

The house flies were collected from entrances and trash bins outside of restaurants in Gainesville, FL. A total of 11 pathogens were found but six of them had already been documented. The five new bacteria are *Acinetobacter baumanni, Bacillus pumilus, Cronobacter sakazaki, Methylobacterium persicinum* and *Staphylococcus sciuri*.

This new study now puts the number of pathogens on house flies well up over 200! It is important to control house flies for better human and animal health

Controlling Malaria Mosquitoes

Hebrew University researchers have developed a new, safe and uncomplicated method to control malaria mosquitoes.

The research was conducted in Africa after being tested in Israel. Attractants of plant origin (fruit or flower) were mixed with toxic sugar bait, referred to as the Attractive Toxic Sugar Bait Method (ATSB) and applied in the semi-arid Bandiagara District of Mali, West Africa.

Sites were chosen and baited with guava and honey with and without the toxic additive (boric acid). The solutions were sprayed in two different locations, in the treated region there was a dramatic 90% reduction in male and female mosquitoes. The mosquitoes were found to have fed on the solution (which was dyed to ensure verification).

The research in Mali shows that even a single application of ATSB can substantially decrease mosquito densities. This method is powerful, effective, technologically simple, inexpensive and environmentally safe.

Cattle Care

Revised Trichomoniasis Regulations

"Rule changes were in the works in response to recommendations from the yearly industry-led review of TX trich program."

Changes to Texas' trichomoniasis (trich) regulates went into effect in Nov 2010. As many know, trich is a venereal disease of cattle that causes cows to abort and slow to re-breed. Cows when rested can clear the disease but bulls are infected for life.

One newly adopted rule is that validity of negative cattle trich tests will be extended from 30 to 60 days provided the bulls are not commingled with heifers or cows during that period.

The 'virgin certificate' given to young bulls has also been extended from 30 to 60 days to be exempt from testing prior to change of possession.

No change was made to non-virgin bulls or bulls over 24 months of age, they still must have a negative trich test within 30 days of being imported into TX. Once the animal is in TX, the negative test will be good for 60 days provided they are away from females during this time.

The revisions exempt out-of-state breeding bulls from an entry trich test if they come from Certified Semen Service artificial insemination facilities and where isolated from female cattle.

The final revision will allow untested, non-virgin TX bulls to be sold and moved to a feedlot prior to slaughter. Previously they could only be sold directly to slaughter.

Pesticides Update/Outlook

Fenoxycarb Canceled

EPA has issued that fenoxycarb be canceled by December 31, 2012. Fenoxycarb is a carbamate derivative used to control fire ants and big-headed ants on turf, home lawns, agricultural areas, non-agricultural areas, horse farms, and ornamental nursery stock, and others.

Fenoxycarb products include Award Fire Ant Bait, Fenoxycarb Technical, and Whitmire PT 2120 TF Preclude.

Resmethrin Canceled

Resmethrin has been canceled by the American Mosquito Control Association, the makers of resmethrin. AMCA says that the new studies and registration required by EPA are too costly and exceed the profit value of the product.

Resmethrin is an effective product against mosquitoes.

The loss of resmethrin could have a big impact on mosquito control.

http://www.epa.gov/pesticides/reregistration/resmethrin

Interested in Pesticide Tolerance – EPA gives you a way to check

http://www.epa.gov/opp00001/regulating/part-180.html

EPA has updated an online tool that makes it easy to search the pesticide tolerance information on food and feed commodities.

The site provides a way to locate the Code of Federal Regulations section numbers for pesticides that a person wants to look up the permanent tolerance for. The tolerance requirements can also be found by the common name of the pesticide or by the type of pesticide.

The index provides:
- 40 CFR part 180 section
- Chemical Abstracts Service (CAS) registry number and name
- Pesticide type and family
- EPA pesticide chemical (PC) code
- Tolerance-specific information about pesticide chemicals and crop groups by commodity, crop group, or crop subgroup

Livestock/Veterinary Entomology Website Is Up

My website is officially online, please take a look. It is designed to provide information on the common livestock/ veterinary insect pests, as well as give people an option to contact me and provide information on upcoming events. Let anyone that might be interested know about it and let me know what you think.

http://livestockvetento.tamu.edu

Pesticide Stewardship

The Center for Integrated Pest Management (CIPM) has launched a new Pesticide Environmental Stewardship (PES) website.

The site is designed for any person that applies, sells, stores, or disposes of pesticides; provides advice or training on pesticide use; or is involved in pesticide stewardship or regulation.

Sounds like all of us could benefit from looking at the site.

http://pesticidestewardship.org

Thank a Farmer

Do you know that one farmer feeds 155 people?!

I can tell you people in NYC didn't. Here is a little clip of them learning how much farmers do and giving thanks in return. All farmers should watch to see how much they are appreciated.

http://www.dairyherd.com/news_editorial.asp?pgID=675&ed_id=12794&news_id=29137&ts=nl2

Human & Animal Disease & Health

Global Warming Does Good

The warmer weather occurring in the US is having adverse effects on the bubonic plague, and this is good. The warmer weather has made it more difficult for bubonic plague to survive in rodent burrows.

Since rodents are reservoirs for bubonic plague, spread by fleas, it is great to have less of the bacteria carrying fleas hanging around their homes.

The change in climate causes the snow to melt earlier and the soil to dry out more, therefore leading to lowered humidity in the burrows. The lower humidity causes the fleas to die off. Fleas are the carriers of the bacteria causing bubonic plague from rodents to humans.

Causes of plague have been low in the US (a dozen or so) with only 1 to 3 deaths per year, but with the expansion of people into rural areas, incidences could increase; lowering the number of fleas with bubonic plague pathogens is always good.

Another Integrated approach to controlling ticks

Ticks are one of the most affluent transmitters of pathogens that cause severe human and animal diseases. Fighting ticks can be a costly and extensive process.

A researcher from Washington University has suggested another way to fight ticks and their diseases – weeding.

Brian Allan has noticed that Amur honeysuckle, an invasive Asian plant, is a popular meal choice for white tailed deer the number one host of the Lone Star Tick.

Allan has suggested weeding areas of the Amur honeysuckle in order to cut back on the number of attracted white tailed deer, which will lead to a reduction in the number of pathogen ticks present in an area.

This is not a new concept, entomologist have been suggesting this kind of control for insects for years but this is the first time I have heard using this tactic for mammals; sounds promising.

Milk Rap Video

This is a fun video done by four young adults; a neat way to promote dairy farming.

http://www.elabs3.com/ct.html?rtr=on&s=ikv,18csu,2ycc,9k3q,cquv,5i8f,dcxy

Special Topics of

Manure Digesters among Us

At this year World Dairy Expo, the audience was informed that the US has the potential to hold 3000 to 4000 manure digesters. Many of these would be located on dairy farms.

Currently there are 150 manure digesters operating in the US, 50% of those are in four states.

Reports show that the electricity generating potential is possible by more manure digesters but building one is more of an obstacle.

Manure digesters are the only system available to give people the opportunity for revenue generation.

The hold up to getting more digesters established in the US is the many policies and financial barriers.

It is believed that the policy and energy issues will resolved themselves and more digesters will be made available.

Journal Reviews

Detection of target site resistance to pyrethroids and organophosphates in the horn fly using multiplex polymerase chain reaction. 2010. Foil et al. J Med Entomol. 47: 855-861.

Horn fly populations from Texas, Louisiana, Washington, Georgia, Mexico and Brazil were evaluated genetically for known target resistant sites in the DNA.

All populations were found to have the pyrethroid-associated mutation with females having it more often than males. All populations except Brazil had the target site for organophosphate resistance with not gender bias but the site did not provide the level of resistance required, so it is believed there is another mutation involved in OP resistance.

The Impact. Having information about the resistant mutation sites enables researchers to develop more efficient ways to control horn flies.

Detection of West Nile virus in stable flies (Diptera: Muscidae) parasitizing juvenile American white pelicans. 2010. Johnson et al. J Med Entomol. 47:1205-1211.

Stable flies were observed parasitizing prefledged American white pelicans in a pelican breeding colony in northeast MT where die-offs due to WNV have occurred since 2002.

Stable flies that had fed on pelican blood were tested of WNV. Sixty tests on unengorged females were run with 18 coming up positive. Engorged females had 54% test positive for WNV.

The Impact. The stable fly has not been implemented as a transmitter of pathogens; these results indicate otherwise and could impact the livestock industry in other ways.

Purification and characterization of an antimicrobial peptide, insect defensin, from immunized house fly (Diptera: Muscidae). 2010. Dang et al. J Med Entomol. 47: 1141 -1145.

The researchers were able to isolate the antimicrobial peptide, insect defensin, which was thought to be a part of the house fly's immune system.

This peptide was isolated and examined. The researchers confirmed that the peptide had high activity against gram-positive bacteria but lower activity against gram-negative bacteria and fungi.

The Impact. Provides evidence and insight to how house flies can carry many pathogens but not be affected by them.

Adult house fly (Diptera: Muscidae) activity and age of females near varying levels of (Z)-9-Tricosene on a southern California dairy. 2010. Butler & Mullens. J Econ Entomol. 103:1929-1936.

Conical screened traps were set up on a dairy in southern California containing either sugar or sugar and (Z)-9-Tricosene (attractant in house fly baits).

More male house flies than female house flies were collected in the traps and more flies were collected in the traps with (Z)-9-tricosene.

Dosage of (Z)-9-tricosene or sugar did not have any effect on the number of house flies collected.

The Impact. The house fly baits on the market today do work at attracting house flies and data shows that one is not more effective than the other.

Comparison of bacterial diversity in wheat bran and in the gut of larvae and newly emerged adult of *Musca domestica* (Diptera: Muscidae) by use of ethidium monoazide reveals bacterial colonization. 2010. Su et al. J Econ Entomol. 103: 1832-1841.

The objective of this study was to investigate the bacterial colonization in the house fly larvae and newly eclosed adult gut. The wheat bran media was also tested for comparison.

Altogether 24, 11 and 4 phylotypes were found in the wheat bran, larvae gut and adult, respectfully. Two of the bacteria found in large quantities in the larvae gut were detected in the newly emerged adult flies.

The Impact. This study shows that bacteria are capable of being maintained in the gut throughout metamorphosis and spread around further once the fly takes flight.

Selection for resistance to imidacloprid in the house fly (Diptera: Muscidae). 2010. Kaufman et al. J Econ Entomol. 103: 1937-1942.

This study shows that in only five generations an imidacloprid susceptible house fly strain will become resistant. The imidacloprid resistance increased 331-fold at an LC_{70}.

In order to get 70% kill of the fifth generation of house flies, more than twice the recommended amount of active ingredient was necessary.

The Impact. It is important to rotate all insecticide products being used on a regular basis (fly baits included). Resistance will develop in all the major fly species (house fly, horn fly and stable fly) without pesticide class rotation.

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Response of tabanids to Nzi traps baited with octenol, cow urine and phenols in Canada. 2010. Mihok & Mulye. Med Vet Entomol. 24: 266-272.

Cow urine and the two attractant phenols of cow urine were compared to octenol in tabanid bait traps.

Horse fly (tabanids) collections were increased with the addition of octenol regardless if urine or phenols were present. Phenols alone did not collect horse flies, increases occurred with cow urine alone and with cow urine and octenol.

The Impact. This information will help improve attractants used in baiting horse flies to traps, the most effective way to control horse flies.

Field effects of faecal residues from ivermectin slow-release boluses on the attractiveness of cattle dung to dung beetles. 2010. Errouissi & Lumaret. Med Vet Entomol. 24: 433-440.

This study utilized pitfall traps baited with manure pats from cows treated with ivermectin boluses against manure pats from cows without ivermectin.

With the use of the pitfall traps it was found that the ivermectin treated pats where more than twice as attractive as the control pats.

The Impact. This attractiveness will lead to the demise of dung beetles. The adults go to the treated pats more but they lay less eggs and the ensuing larvae do not fare as well.

Genetic structure and population dynamics of the biting midges *Culicoides obsoletus* and *Culicoides scoticus*: implications for the transmission and maintenance of bluetongue. 2010. Pili et al. Med Vet Entomol. 24: 441-448.

The DNA analysis of the two Culicoides species provides information on to their identification. These two species are so similar in appearance they have been difficult to separate, DNA analyses will change that.

It was unclear as to whether or not these species took part in transmitting Bluetongue (BT) virus but this study suggests that they do.

The Impact. Knowing the behavior of the three *Culicoides* species now identified by DNA, suggests that all three do transmit BTV.

Incrimination of the mosquito, *Aedes taeniorhynchus*, as the primary vector of heartworm, *Dirofilaria immitis,* in coastal Yucatan, Mexico. 2010. Manrique-Saide et al. Med Vet Entomol. 24: 456-460.

The researchers collected mosquitoes for 18 consecutive nights found feeding on dogs positive for *Dirofilaria* sp. Nine of the species collected where found to have filarial nematodes in their midgut.

Only *A. taeniorhynchus* and *A. crucians* were found to have third instar filarial nematodes in the midgut. Only the filarial worms in *A. taeniorhynchus* were found to be *Dirofilaria immitus*.

The Impact. This data indicates *A. taeniorhynchus* as a significant vector of dog heartworm although in America their rate as a carrier is much less.

Control of *Culex quinquefasciatus* in a storm drain system in Florida using attractive toxic sugar baits. 2010. Muller et al. Med Vet Entomol. 24: 346-351.

Attractive toxic sugar baits (ATSBs) were used to control mosquitoes in storm drains of residential areas near St. Augustine, FL.

Treated experiments consisted of brown sugar, fruit juice, green dye and boric acid; untreated experiments were treated with orange dye. Mosquito larvae were added to the drain and adults were trapped. 87% untreated adults were found to have feed on the ASBs and 84% females and 87% males were found to feed on ATSBs.

The Impact. ATSBs are effective mosquito control options for storm drain systems.

The Gulf Coast tick: A review of the life history, ecology, distribution, and emergence as an arthropod of medical and veterinary importance. 2010. Teel et al. J Med Entomol. 47: 707-722.

This article is a very thorough and in-depth look at the Gulf Coast tick, a major medical and veterinary important pest known to transmit many disease causing pathogens.

The Impact. The article is written by my colleague Dr. Pete Teel et al. and does a wonderful job of further understanding the Gulf Coast ticks importance.

Livestock/veterinary website, Now up!!

http://livestockvetento.tamu.edu