

Pest Management News

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Letter #5

September 30, 2014

How Do I Confirm the Bed Bugs are Gone?

John D. Hopkins

If you have ever dealt with a bed bug problem, then you are always left with one nagging question. How do I confirm that the bed bugs are actually gone?

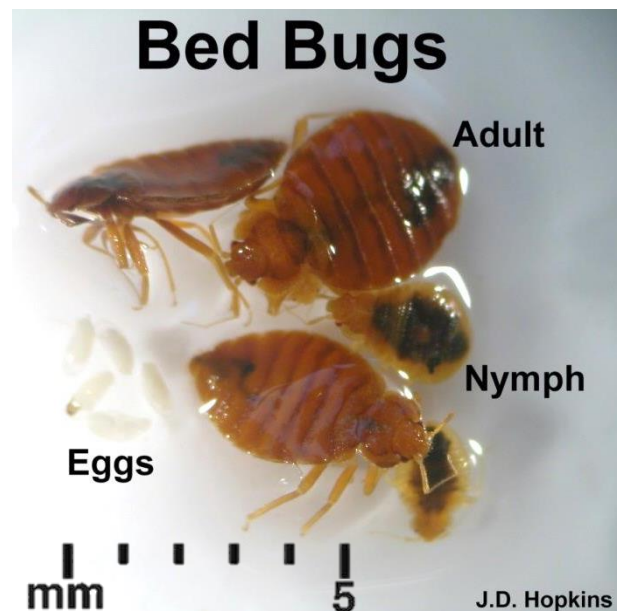
Bed bug infestations can re-occur in a home, apartment, dormitory, etc. for one or both of the following two reasons:

1. Bed bugs were re-introduced back into the area through hitchhiking on people's belongings or crawling from another unit.
2. The treatment effort only lowered the infestation level rather than totally eliminating it. This situation is also known as "rebounding."

Observing no bed bug activity for 60 days (with appropriate monitoring and inspection) is generally accepted as proof of elimination. Bed bug activity is any sign of bed bugs: bites, new bed bug fecal stains on sheets, visual sightings, etc.

To prevent rebounding, you or, preferably, a pest management professional must confirm that the bed bugs were eliminated before you return the area to a routine pest inspection schedule (usually quarterly).

Evaluate the effectiveness of each bed bug treatment within two weeks following the treatment date to determine control. If there are still signs of bed bug



activity, treat again. Some control methods such as whole-home heat or fumigation can result in elimination after one treatment. Other methods may require re-treatments. Always evaluate the effectiveness of each treatment.

Discuss the following with your pest management professional to determine the appropriate method(s) for evaluating the success of your treatment efforts.

1. Interview occupants. Ask when they last experienced bed bug activity.
2. Inspect treated rooms and adjacent areas visually. Use a flashlight and look for bed bug activity within 10 feet of any area where bed bugs are likely to infest. If a visual inspection is the only way you are evaluating treatment efficacy, do a thorough inspection including looking at all parts of the bed (including underneath), upholstered furniture, and other fixtures and furniture. If doing visual inspection along with using monitoring devices and/or scent-detecting canines, a quicker inspection is justifiable.
3. Use a bed bug scent-detection canine team.
4. Place bed bug monitors according to the manufacturer's instructions and include looking in the monitors as part of the visual inspection.
5. For further guidance on steps 3 and 4, see [NPMA's Bed Bug Best Management Practices](#).

Additional information on bed bugs may be found on the [Bed Bug Pest Solutions webpage](#).

Zyrox: A New Granular Fly Bait

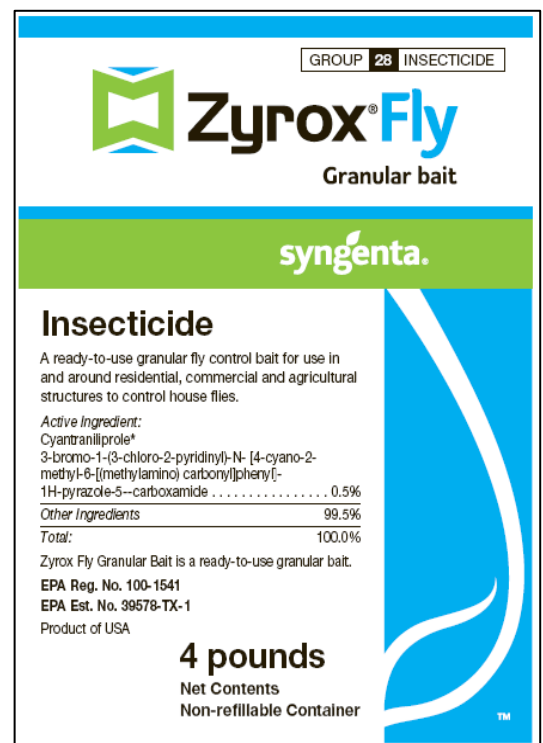
John D. Hopkins

Combating the development of resistance by house flies to insecticides is a constant struggle. Zyrox Fly Granular bait is newly registered in Arkansas and contains *cyantraniliprole*, a unique active ingredient with no documented resistance. This new bait can be used to effectively control house flies in urban, rural, and commercial areas. The bait matrix in this product is highly attractive to flies, even without a pheromone lure. Zyrox is an ideal rotational partner in Integrated Pest Management (IPM) and Insect Resistance Management (IRM) programs for fly control in areas where resistance to other chemistries is a problem. This new material is labeled for use in the most common areas where high fly densities result in complaints, such as around the following areas:

- Indoors (when used in a bait station)
- Outdoors in areas used for storing waste in refuse dumpsters that are fenced in or inaccessible to children and pets, such as restaurants, grocery stores and warehouses
- Outdoor areas of commercial operations, such as dairy, meat and poultry processing plants
- Production animal facilities, such as livestock housing structures.

A copy of the full label can be seen by clicking on the following link:

<http://www.cdms.net/LDat/ldBUA002.pdf>.



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Poultry Mites

Kelly M. Loftin and Ricky F. Corder

Mites in poultry production can become significant pests in commercial, organic and backyard poultry production. Physical damage caused by mites can result in lowered egg production, reduced weight gain and carcass downgrading. Often the type of operation (commercial, backyard, free range, etc.) will influence the potential of a specific mite species to cause economic damage. Depending on the mite species, control may be either aimed directly at the bird, the premises or both. For additional information of insecticides labeled for use against poultry pests, check out the Poultry section of the “2014 Insecticide Recommendations for Arkansas” available at:

<http://www.uaex.edu/publications/pdf/mp144/b-animals-poultry.pdf>

Northern fowl mites: Northern fowl mites are bloodsucking parasites of poultry that can significantly reduce production and considered the most important external parasite of poultry in the U.S. Northern fowl mite (feather mite), *Ornithonyssus sylviarum* (Canestrini and Fanzano), has been found in AR since 1960. It is a serious external parasite of poultry with heavy populations capable of significantly reducing egg production. The northern fowl mite, unlike other mite pests of poultry, spends its entire life cycle on the bird sucking blood and causing irritation. The only time it is found off the bird is when extremely heavy infestations occur. When this occurs they may be found on eggs laid by infested birds and can cause some annoyance to egg handlers and other personnel.



Northern fowl mite symptoms on vent area of chicken. Photo by Brad Mullins, UC-Riverside.

The northern fowl mite usually spends its entire life cycle on the host and is the only species that remains on the bird during the day. Check for mites first on the vent, then tail, back and legs of layers. The life cycle of the mite consists of the egg, larva, nymphal stages, and adult and can be completed in as little as a week. Mite eggs are laid in the bird's feathers and hatch in one to two days. After hatching, mites go through a series of molts, leaving cast skins in the feathers of infested birds. Adult mites are eight-legged, about 1mm in length, and are red to black in color. Mite numbers can build rapidly due to the short duration of the life cycle. Northern fowl mites may spread through the introduction of infested birds, on clothing or equipment, or from wild birds such as sparrows.

Feathers of infested birds exhibit a dirty, rough, matted appearance due to a buildup of mite eggs, cast skins, dried blood from feeding, and mite excrement, especially in the vent area. Scabs often form on infested areas of the bird's body. The presence of these mites is often first noticed on the

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chicken eggs. Early detection can reduce the number of caged layers that need treatment. Birds should be monitored weekly for mites by examining the base of feathers around the vent. When mite numbers are greater than 50, treatment should be considered. Several other things should be considered before a control decision is made. It may not be economical to treat older birds because mite numbers are not likely to increase as quickly compared to younger birds. Finally, because mite populations increase in cooler weather, infestations can be expected to increase in the fall and decrease as temperatures warm in the spring.

Destroying bird (such as sparrow) nests around poultry facilities is recommended. Although mites spend their entire life cycles on the birds, they can live off the birds for several weeks, provided temperature and humidity are suitable. For this reason, a house vacated for less than 3 weeks may have mites, which will infest newly placed birds. Populations of northern fowl mites build faster on young birds than on older birds and tend to be worse in cool weather.

When chemical control measures are indicated, it is very important to direct the insecticide application to the vent area using sufficient pressure to allow wetting of the skin. Treatment of the litter may be necessary if the previous flock was heavily infested and the facility will not be vacant for long.

Chicken Mites: Chicken mites are bloodsucking parasites of poultry that can significantly reduce production. The chicken mite, *Dermanyssus gallinae* (DeGeer) is a common pest of poultry in Arkansas. This pest remains secluded during the day in cracks and crevices and emerges at night to feed on poultry. Heavily infested birds become listless and exhibit pale combs and wattles from blood loss. Weight gain and egg production can also be adversely affected. Problems with chicken mites seldom occur in caged-layer operations because there are few places for mites to hide and lay eggs. More serious problems can occur in breeder houses where nest boxes and slats offer ideal hiding places.



Area infested with chicken mites. Photo by British Free Range Egg Producers Association.

Chicken mites do not usually increase to serious numbers in broiler flocks due to the short grow-out cycle that prevents a population build up.

The chicken mite feeds intermittently and is usually found on the host at night. This mite is very small and grayish before feeding but becomes deep red or nearly black after a blood meal. Due to the

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presence of mites and eggs, infested areas can have an appearance resembling a salt-and pepper mixture.

Mite eggs are laid in cracks or under dry manure in the house. In warm weather, the life cycle of the chicken mite can be completed in 7 to 10 days, with mites being inactive in cold weather.

A mite infestation may go unnoticed unless birds are examined at night; and as a result, examination of cracks and crevices in the poultry facility is a more effective method for determining mite presence. Modern egg production practices have almost eliminated this mite as a pest, because suspended wire cages reduce the number of mite oviposition sites. Bird production on litter or an operation using nest boxes is more susceptible.

Chicken mites can be controlled, not by direct treatment of birds, but by thorough treatment of the house and litter with a recommended insecticide. Vacant houses, with a history of infestation, should be treated thoroughly before the introduction of new birds because chicken mites can survive several weeks without feeding.

Scaly-leg mite: Scaly-leg mite, *Knemidocoptes mutans* (Robin and Lanquentin), is a highly contagious bloodsucking parasite of poultry, that can significantly reduce production. The scaly-leg mite is occasionally found on flocks in Arkansas, particularly on flocks raised on the ground or in roosts. This mite has also been reported on pheasants, partridges, bullfinches, goldfinches, and many passerine birds. It is suspected that wild birds transmit the mites to domestic flocks. Irritation from mite infestation causes poultry to pick at the crusty formations. As formations extend over the feet and legs, they interfere with joint flexion and cause lameness. Severe infestations may cause loss of toes, loss of appetite, lowered egg production, emaciation, and death.



Scaly-leg mite symptoms. Photo by Dr. Dietrich Barth, Merial.

Scaly-leg mites burrow under scales on the feet and legs of fowl, resulting in irritation, sores, and secretions. The female mite is small with a round body and short, stubby legs. These mites require magnification to be seen because they are only 0.4mm long. Newly hatched mites are at first six-legged and, through progressive molts, become eight-legged.

Female mites burrow under scales on the feet and legs of poultry and deposit eggs. The entire life cycle from egg to adult requires 10 to 14 days. Female mites begin laying eggs a short time after they burrow under the skin and continue to lay eggs for about 2 months.

Mites burrow beneath scales on feet and legs resulting in a powdery material that accumulates and binds into a scab of serum discharge. Affected feet and legs usually have red blotches. Glands in the mouthparts of mites may secrete an irritating fluid that causes the discharge and blotches. Eventually,

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the feet and legs may be covered with these crusts or scabs. Mites remain beneath the crusts in small oval vesicles. Irritation from mite infestation causes poultry to pick at the crusty formations.

The scaly-leg mite is more of an issue on flocks raised on the ground or in roosts. Relocation of pens after treatment helps in preventing new mite outbreaks. If scaly-leg mites are found, insecticide treatment of the entire flock is necessary. Also, disinfect roosting areas and pen enclosures. Relocation of pens can aid in preventing new mite outbreaks.

Domestic Dogs and Wildlife

Becky McPeake

In the previous Pest Management Newsletter, the impact of free-ranging domestic cats (*Felis catus*) on wildlife populations was discussed. This article focuses on domestic dogs (*Canis familiaris*) and wildlife.

Although studies about interactions between cats and wildlife are prevalent and highlighted in the media, problems caused by dogs receive comparatively little attention. Furthermore, [The Wildlife Society](#) (a professional association of wildlife biologists) prepared a national policy position about domestic cats and wildlife, but nothing about domestic dogs and wildlife. So do domestic dogs pose a problem for wildlife?

A recent literature review (Hughes and Macdonald 2013) found 69 articles in which most focused on domestic dog predation of wildlife, followed by disease transmission (primarily rabies), wildlife disturbance, hybridization, and predation of dogs by wild carnivores. Documentation about dogs harassing wildlife, specifically white-tailed deer (*Odocoileus virginianus*) dates back to the early 1950s. Free-running dogs were believed responsible for the perceived slow growth rate of existing and translocated deer in the northeast U.S. In the 1970s, a study conducted in the southeast U.S. concluded that hunting deer with scent-trailing hounds did not limit the deer herd's reproduction or change their home ranges. Another study implied when deer (*Odocoileus* sp.) are physically stressed and in poor health, dogs may have a significant impact on deer populations.

Part of the difficulty in determining wildlife mortality by domestic dogs is their close relation with native canines, such as coyotes. It is known that free-ranging domestic dogs, particularly when hunting in packs, can mortally



Domestic dog chasing elk in Colorado. Photo from [La Plata County website](#)

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injure or kill deer and other wildlife (and livestock). In one study, researchers combined predation by coyotes and feral domestic dogs under one category, since they were unable to distinguish between the two.

Dogs can impact wildlife in ways besides direct mortality. In 1999 the Montana Chapter of The Wildlife Society developed a review of the effects of domestic dogs on Rocky Mountain wildlife. They noted off-leash dogs could force movements of deer and other ungulates in winter when their survival strategy is energy conservation. The implication is that such unnecessary disturbances by dogs, even if no immediate mortality occurs, could deplete their reserves and effect winter survival. The report noted that during summer, dogs can cause disturbance to birth and rearing of young for all wildlife species.

A 2008 Colorado study compared wildlife activity on two trails - one that permitted dogs and another that did not. They found the presence of dogs along recreational trails correlated with reduced activity patterns of mule deer (*Odocoileus hemionus*) within 100 meters of the trail, and also squirrels and rabbits within 50 meters of the trail. Bobcats were detected less frequently in areas allowing dogs, while red fox were detected more frequently.

An Australia study (Banks and Bryant 2007) reported the act of dog walking negatively impacted the presence of birds in natural areas. They surveyed 90 sites which either permitted walkers with dogs or walkers without dogs, and control sites (no walkers or dogs). A researcher counted birds seen and heard up to 10 minutes after a dog walker, or walker alone, passed a trail transect. Dog walking caused a 41% reduction in the number of individual birds detected and a 35% reduction of species, more than just walkers alone. They suggested prohibiting dog walking from sensitive conservation areas.

In summary, compared to studies of domestic cats, the broader impacts of domestic dogs on wildlife populations is relatively unclear. Studies imply domestic dogs can be a threat to prey species which are declining in number (e.g., species of concern, threatened or endangered species), and recommend dogs should be restricted from those areas.

Invasive Kudzu Bug Confirmed in Arkansas

Nick Seiter

The kudzu bug (*Megacopta cribraria*) was found for the first time in Arkansas on Monday, September 8 in Crittenden County near Marion. This insect feeds and develops in kudzu and soybean, and has become an economic pest of soybean in the southeastern U.S. A native of Asia, kudzu bug was found for the first time in the U.S. in northern Georgia in fall of 2009. A link to the current distribution in the United States can be found at www.kudzubug.org, along with a variety of additional information concerning biology, identification, and management of this insect.

Kudzu bug adults are brown to olive green in coloration, have an unusual box-like shape, and are usually just under ¼" in size. They lay cylindrical, creamy white eggs in parallel rows. The newly hatched nymphs are orange in color, and as the nymphs develop they become light green to tan and take on a hairy appearance. Kudzu bugs go through five molts before they reach adulthood; the fifth and final "instar" before adulthood has large, distinct wing pads. Kudzu bugs go through two generations per year, and take about 6-8 weeks to develop from egg to adult.

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Kudzu bug adults



Kudzu bug egg mass with hatching nymphs (photo: Dr. Jeremy Greene)



Kudzu bug nymphs

Identification of the nymphs in particular is a key to managing this insect in soybean. Kudzu bugs feed on plant sap, usually at the stems. This reduces yield by impacting plant vigor, but kudzu bugs do not feed on or damage the seeds themselves. In the southeast, a treatment threshold of 1 nymph per sweep is recommended (note that this is significantly higher than our stink bug and earworm thresholds in soybean). Applications targeting adults, while effective in killing the insects, often result in quick re-infestations of the field. However, when nymphs appear it is usually a sign that adult immigration into the field is complete, and a single application is generally sufficient for season-long

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control. Pyrethroid insecticides, in particular bifenthrin and *lambda*-cyhalothrin, are very effective for kudzu bug control. In addition to soybeans, kudzu bugs are an occasional nuisance pest in homes where they seek overwintering sites. Furthermore, kudzu bug adults often aggregate on a wide variety of plants, including many ornamentals. While these infestations can cause a visual nuisance, kudzu bugs do not typically cause damage to plants other than soybean, kudzu, and some closely related legumes.

The kudzu bug infestation observed in Crittenden County is small, and appears to be localized based on sampling in other counties. Given how late we are in the soybean growing season, it is highly unlikely that we will have any kudzu bug management issues in soybean this year, even if the adults show up in some fields (to be clear, we do not have any reports of kudzu bugs infesting soybeans yet in Arkansas). However, please be on the lookout for this insect, and report any suspected findings to Dr. Gus Lorenz (glorenz@uaex.edu), Dr. Glenn Studebaker (gstudebaker@uaex.edu), or myself (nseiter@uaex.edu). Kudzu patches, especially those in well-traveled areas (roadsides, truck stops, rest areas, etc.) are the most likely areas where these insects might be found. If you think you have found kudzu bugs, please take pictures, and if possible collect some of the insects for verification.

Pesticide Formulations

Ples Spradley

A pesticide formulation is a mixture of chemicals which effectively controls a pest. Pesticide active ingredients in their “raw” or unformulated state are not usually suitable for pest control. The chemicals may not mix well with water, may be chemically unstable, and may be difficult to handle and transport. For these reasons, manufacturers add inert substances such as clays, solvents, and other substances to improve solubility, application effectiveness, safety, handling, and storage.

Inert ingredients do not possess pesticidal activity and are added to serve as a carrier for the active ingredient (a.i.). The mixture of active and inert ingredients is called a pesticide formulation. This formulation may consist of:

- The pesticide active ingredient that controls the target pest.
- The carrier, such as an organic solvent or mineral clay.
- Surface-active ingredients, such as stickers and spreaders.
- Other ingredients, such as stabilizers, dyes, and chemicals that improve or enhance pesticidal activity.

A single active ingredient often is sold in several kinds of formulations. Abbreviations are often used to describe the formulation (e.g., WP for wettable powders); how the pesticide is used (e.g., TC for termiticide concentrate); or the characteristics of the formulation (e.g., LO for a low-odor formulation). The amount of active ingredient and the kind of formulation are listed on the product label. For example, an 80% SP contains 80 percent by weight of active ingredient and is a soluble powder. If it is in a 10-pound bag, it contains 8 pounds of a.i. and 2 pounds of inert ingredient. Liquid formulations indicate the amount of a.i. in pounds per gallon. For example, 4F means 4 pounds of the a.i. per gallon in a flowable formulation. Some common formulation abbreviations are listed below.

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A	= Aerosol	M	= Microencapsulated
AF	= Aqueous flowable	MTF	= Multiple temperature formulation
AS	= Aqueous solution or suspension	P	= Pellets
B	= Bait	PS	= Pellets
C	= Concentrate	RTU	= Ready-to-use
CM	= Concentrate mixture	S	= Solution
CG	= Concentrate granules	SD	= Soluble dust
D	= Dust	SG	= Soluble granule
DF	= Dry flowable	SP	= Soluble powder or soluble packet
DS	= Soluble dust	ULV	= Ultra low volume
E	= Emulsifiable concentrate	ULW	= Ultra low weight or ultra-low wettable
EC	= Emulsifiable concentrate	W	= Wettable powder
F	= Flowable (liquid)	WDG	= Water-dispersible granules
G	= Granules	WP	= Wettable powder
GL	= Gel	WS	= Water soluble
L	= Liquid (flowable)	WSG	= Water-soluble granules
LC	= Liquid concentrate or low concentrate	WSL	= Water-soluble liquid
LV	= Low volatile	WSP	= Water-soluble powder packet

The formulation can affect many things an applicator should be aware of including: drift potential, handling & exposure hazards, agitation requirements, wear on pumps & spray tips, etc. For more information on formulations, read the chapter on Pesticide Formulations (Chapter 4) in the National Pesticide Applicator Certification Core Manual: <http://nasda.org/File.aspx?id=12129>

Flyspeck and Sooty Blotch: Cosmetic Diseases of Apple

Sherrie E. Smith

Its apple season, and farmer's markets and grocery stores are filling up with this season's apple crop. Many homeowners with apple trees have been eagerly waiting for their crop of apples to ripen, only to be disappointed by discolored fruit.

There are many diseases that afflict apples, but two of the most common are caused by fungi that grow superficially on the surface of the fruit. Flyspeck caused by *Schizothyrium pomi*, and Sooty blotch caused by *Gloeodes pomigena* are usually found in orchards with no spray program. Flyspeck and Sooty blotch do not rot the fruit, but causes the fruit to be unsightly and unmarketable. Most of the apple crop in the southeastern United States would be affected each year if not for the use of protective fungicides. Symptoms of flyspeck are groups of a few to 50 or more shiny black, superficial pseudothecia on the surface of the fruit. The colonies are usually 1-3cm in diameter or larger, and round to irregular in shape.

Sooty blotch appears as colonies of olive green on mature fruit. The colonies may be discrete circular to large blotches with diffuse margins which are sooty in appearance. Sooty blotch and flyspeck colonies often occur on the same fruit at the same time. Fungicide sprays should be applied at 10-14 day intervals beginning at first cover to provide the best protection. Fungicides labeled for

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Flyspeck and Sooty blotch are Pristine, Captan, Sovran 50WG, Adament 50WG, and Flint. Good sanitation is also helpful. Fallen leaves and fruit should be removed from the orchard.



Apple with Flyspeck and Sooty Blotch



Apple with Sooty Blotch Only

Name That Weed

Bob Scott

The weed this month is a grass that prefers shady moist areas in yards. It is often mistaken for Bermuda grass and other grass weeds such as crabgrass. Be the first to respond with the correct common name of this agile weed of turf and win a prize. Respond directly to Dr. Bob Scott at bscott@uaex.edu.



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To The Readers

Please offer any suggestions for Urban or Livestock Integrated Pest Management topics (insect pests, plant diseases, weed problems, wildlife control problems) that you would like to see – OR – feel free to submit an article that you have prepared. Kelly and I will be glad to include it (subject to editing). Send feedback to jhopkins@uaex.edu or kloftin@uaex.edu

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