What's Up, Doc?

TEXAS A&M AGRILIFE EXTENSION

Grayson County Ag and Natural Resources Newsletter

Vol 2: Issue 7 (July 2023) by D. Chad Cummings

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District IV 4-H Horse Camp, June 2023 (*Gainesville*)

Grayson County USDA crop report summary

July 5, 2023

Hot, dry conditions persisted this past week, with near or over 100F days all week, and nighttime temps remaining high and humid. Soil moisture deep continues to be in good shape, but topsoil moisture dried out significantly over the past two weeks. Poultry began to see the effects of hot dry weather with some heat related deaths reported. Cattle, small ruminants, and other livestock seem to be faring well. Overall crop condition is still good. Corn and sorghum are in grain filling stage. Wheat harvest has concluded across most of the region. Soybeans and cotton look good. Pasture condition is good, although pockets of large grasshopper populations have emerged and are beginning to decrease pasture crop yields. Insects are on the rise including fall web worms which have started to be active. Nuisance flies are heavy in livestock areas, and house flies are thriving in the hot weather. Mosquito populations are very high in some areas. No major disease outbreaks to report in any crops or livestock currently.

Common summer sound insects (Cicadas and Grasshoppers)

Annual Cicada (*Neotibicen canicularis*)

Differential Grasshopper (*Melanoplus differentialis*)

What is West Nile virus?

Wide-ranging mosquito airborne disease could affect pets, livestock and humans

JULY 6, 2023

Recent rainfall has led to a mosquito population increase across all regions of Texas. Texas A&M AgriLife Extension Service experts advise individuals and pet and animal owners to be mindful of West Nile Virus, WNV, a mosquito-borne virus that is prevalent in the U.S., and its effects.

The substantial amount of rainfall across Texas has heightened concern over growing mosquito populations. Emergency management meetings are being held to discuss recent flooding and standing water. The risk of mosquito-borne diseases like malaria and WNV has increased.

J.D. Ragland, Ph.D., AgriLife Extension agriculture and natural resources agent in Randall County, said it was announced during one of those recent meetings that WNV testing confirmed positive results in Randall County.

Protecting yourself and your animals

Ragland advised individuals to be vigilant of their surroundings to reduce the risk of transmission.

“Standing water in nearby lakes, trenches or even household items like flowerpots and wheelbarrows should be removed,” Ragland said.

He also advised that backyard pools, if not in use, should be drained for the most precaution.

“People with household pets should monitor their movements, and try to limit them to indoor places,” Ragland said.

People should also be aware of their whereabouts and of clothing, he said.

“It is important to wear long sleeve clothing and long pants,” Ragland said. “Most important is the constant application and reapplication of mosquito repellant with ingredients like DEET, oil of lemon eucalyptus and picaridin, as they are EPA-registered. Mosquitoes actively feed at dusk and dawn, so remain indoors during those times as much as possible.”

Medical preventions

There are annual vaccinations for animals that counteract WNV. According to the Timber Creek Veterinary Hospital, most veterinarian hospitals offer core vaccines administered to all pets that work against tetanus, rabies, encephalomyelitis and WNV.

It is recommended for already vaccinated horses to be vaccinated in the spring, or a suitable time before the mosquito season. “If a horse has not been previously vaccinated, the initial dose should be administered as soon as possible.” Ragland said.

If you believe you or your horse have been infected, watch for the following symptoms:

Symptoms in horses:

- High fever.
- Incoordination; stumbling, staggering and/or sluggish.
- Inability to stand.
- Off feed, no desire to eat.
- Acute death.

Symptoms in people:

According to the Centers for Disease Control and Prevention, the majority of people infected do not develop any visible symptoms. Of the few people who do, they can expect to see:

- High fever.
- Headache.
- Neck stiffness.
- Disorientation.
- Muscle weakness.
- In extreme cases, convulsions, numbness, paralysis and coma.

The Centers for Disease Control and Prevention has additional guidelines for WNV safety precautions.

Health officials throughout Texas are continuing WNV testing. The Texas Department of State Health Services, DSHS, has reported the recent Texas counties with West Nile activity that can be found here: DSHS West Nile graph.

For more information on WNV in animals, visit the Texas A&M Veterinary Medical Diagnostic Laboratory at https://tvmdl.tamu.edu/.

Reporting for this story was provided by Fatyma Lawal, part of the Science Influencers program in the Department of Agricultural Leadership, Education and Communications.

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June heat stress hurts Texas agriculture

Texas Crop and Weather Report – July 5, 2023

JULY 5, 2023

A June heat wave caused agricultural conditions to decline around much of the state after steady improvements over the previous month, according to Texas A&M AgriLife Extension Service experts.

May rains dramatically improved soil moisture conditions in many drought-stricken areas of Texas, but triple-digit temperatures and little to no rain in June were trending many areas back toward drought. Various crops around the state were showing stress from high temperatures and lack of soil moisture, and livestock gains likely experienced heat-related declines.

Heat wave takes toll on Texas crops

The heat wave was especially harsh in the southern half of the state, where some areas experienced record temperatures.

All plants and vegetation experience heat stress during extreme daytime and nighttime temperatures like Texas experienced over recent weeks. Heat and inadequate soil moisture can stress plants, damage their cell membranes and disrupt metabolic efficiency during processes like photosynthesis and respiration, said Lee Tarpley, Ph.D., AgriLife Research plant physiologist, Beaumont.

But the combination of high daytime and nighttime temperatures can also economically damage commodity crops, especially during sensitive growth periods like pollination and flowering.

Tarpley said the heat wave was rough on late-planted rice along the Coastal Bend. Yield potentials were high following good spring rains, but the heat arrived at a sensitive development stage for some fields – pollination. High temperatures can also negatively impact the viability of pollen, which can influence how the ultimate crop sets and fills out.

Similar setbacks are occurring in cotton fields that were setting bolls during the heat wave. Stressed cotton plants were aborting bolls in an attempt to hang on as heat indexes near 120 degrees put plants in survival mode, said Josh McGinty, AgriLife Extension agronomist, Corpus Christi.

Cotton crops were having difficulty withstanding the heat over the previous three weeks without adequate moisture, he said. Boll losses were especially bad in dryland fields where soil moisture levels have continued to decline. But even irrigation has not been enough as nighttime lows rarely dropped below 80 degrees.

McGinty said high nighttime temperatures were not allowing cotton plants to shed the heat, which was causing plants to increase respiration. Increased respiration takes resources away from developing bolls.

“Small bolls are the first that the plant will sacrifice when energy reserves are depleted, but if the trend continues, larger bolls will be shed,” he said. “That shedding is evident with small bolls littering the ground in cotton fields.”

Not all the news about the arid conditions was bad. Larry Stein, Ph.D., AgriLife Extension horticulturist, Uvalde, said cantaloupe and watermelon fields in the Winter Garden and Central Texas were producing high-quality, super-sweet fruit. Irrigated vines were thriving, and brix counts were rising under the dry, hot conditions. Brix is the measurement of sugar in fruit.

But overall, Stein said conditions are declining, even for irrigated crops. Heat is not the problem though, it’s the lack of moisture.

“Vegetation is starting to burn up,” he said. “If you can maintain sufficient moisture for plants then they can cool with transpiration from the leaves, but the problem I

see with the heat is stress and the other problems like spider mites and aphids, and everything takes its toll."

Heat impacting livestock production

The heat wave took a toll on more than just crops. Jason Cleere, Ph.D., AgriLife Extension beef cattle specialist, Bryan-College Station, said cattle performance in high temperatures typically declines. Higher nighttime temperatures make it a challenge to get their core body temperature down. Their grazing may also reduce as they try to avoid activity in the sun.

Cleere said Texas heat shows the importance of choosing cattle adapted to more tropical conditions like breeds with Brahman influence.

Forage production for hay, silage and grazing was very good over the last month, Cleere said. Producers were having problems with delays due to rain and excess moisture prior to the heat wave, but the arid conditions were sapping soil moisture levels quickly.

Cleere said it is critical that cattle have adequate shade and fresh water during hot conditions. A cow can drink 20-40 gallons of water per day, depending on the moisture in the grass they are consuming. Cattle should have enough shade to spread out and cool down.

"A small shade structure where they can all barely fit under might be worse than no shade if they're piled up," he said.

June among hottest, coolest for parts of the state

John Nielsen-Gammon, Ph.D., Texas state climatologist and Regents Professor in the Texas A&M Department of Atmospheric Sciences, Bryan-College Station, said the heat wave produced eight "all-time" temperature and heat index records, from Tahoka to Cotulla. June was one of the 10 hottest on record for South Texas.

Most of the state recorded multiple days over 100 degrees, including half the month of June along the Texas-Mexico border up to Midland, five days in triple-digits in Dallas/Fort Worth and Bryan-College Station and three days in Houston.

Conversely, it was cooler than normal in northern parts of the state and one of the coolest Junes on record in Dalhart, near the top of the Texas Panhandle.

“It’s not the hottest summer so far,” he said. “But it’s been quite a bit more humid from all the rain in April and May, and that is where people are really feeling the heat.”

Nielsen-Gammon said high humidity and temperatures contributed to heat indexes well beyond 100 degrees. The dew point, the temperature at which dew forms, was around 70-75 degrees in Central Texas, which translates into an “icky” heat.

But the heat wave has also included a dry spell for much of the state, Nielsen-Gammon said. The same high-pressure system that kept the weather hot kept thunderstorms away from most of the state. The heat has sapped topsoil moisture from previous rains quickly in some areas of the state.

This drying down puts many areas at risk of returning to drought conditions following the earlier rains that had significantly reduced the amount of severely dry conditions, Nielsen-Gammon said. Dry conditions also contribute to higher temperatures because there is no evaporative cooling in the air.

“If we don’t get a decent amount of rain in the next few weeks, we will see more vegetation turning brown and crops suffering,” he said. “The Panhandle and East Texas have gotten enough rain, but the areas that are marginally out of drought are definitely at risk of slipping back.”

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Controlling Fleas

Mike Merchant and James Robinson, Texas A&M AgriLife Extension Entomology

Fleas are small, wingless insects that feed on the blood of animals and people. Americans spend about $9 billion a year controlling fleas – one of the biggest expenses for pet owners.

In Texas, most flea problems are caused by the cat flea, *Ctenocephalides felis*. This flea feeds on cats, dogs, and wildlife. Other kinds of fleas, such as the dog flea, human flea, and rat flea, are less common on pets and in homes. Fortunately, fleas need not be a serious problem because there are many effective treatments.

Identifying the problem

Adult cat fleas are about 1/8 inch long (1 to 3 mm). They are brownish-black, flattened looking, and without wings. Backward-pointing bristles help fleas move through the hairs or feathers of host animals and make them more difficult to remove by grooming. The six legs, especially the hind pair, are long and adapted for jumping.

Flea larvae are less than 1/4 inch long (6 mm), legless, and dirty white in color. The most likely place to find larvae is in infested pet bedding.

Understanding fleas

During their life cycle fleas pass through four stages–egg, larva, pupa and adult. Although they can jump, adult fleas do not usually travel long distances without a host. Fleas prefer to wait and jump onto a passing animal. Once aboard, they remain until they are dislodged or groomed from the animal. Without a host, adult fleas live only a few days to 2 weeks. On short-haired cats and dogs fleas survive an average of 8 days; they live longer on long-haired animals.

The female flea begins laying eggs within 2 days of her first blood meal. Four to 9 days later she produces an average of 27 eggs per day, consuming about 15 times her body weight in blood daily. Much of this blood is excreted as partially digested feces. Flea feces are a fine, reddish-black dust seen in pet fur and bedding.

Flea larvae feed on adult flea excrement. Without it, they cannot survive, although they also may feed on organic matter such as food particles, dead skin, or feathers. Larvae develop in 5 to 11 days.

Fleas do not survive well outdoors in hot, sunny lawns. Relative humidity less than 50 percent or soil temperature higher than 95 degrees F kills flea larvae. Moist, shaded spots near pet resting areas are the places to find fleas. Indoors, flea larvae are usually found under furniture and in pet bedding. The pupa is the transition stage between the larva and adult.

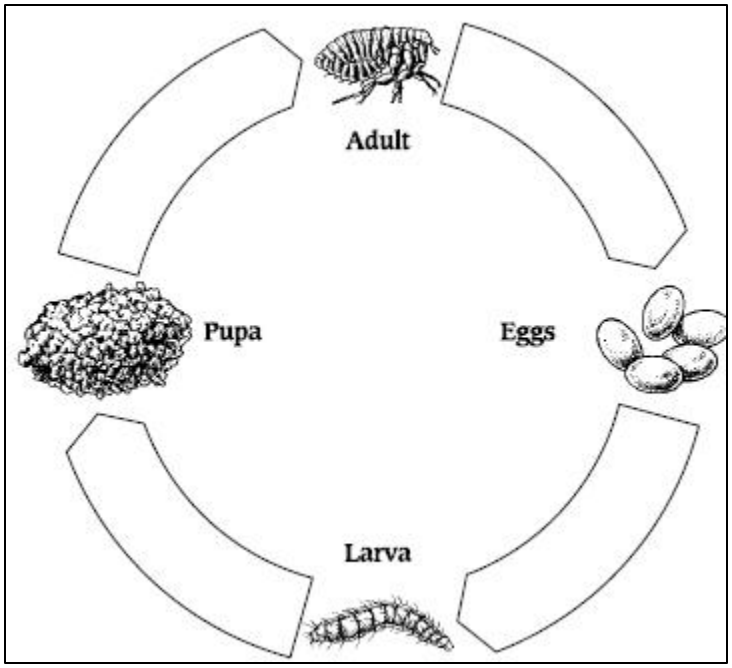
Cat fleas are the most common fleas on dogs and cats. They also infest raccoons, opossums, and coyotes.

The pupa forms inside a cocoon spun by the larva. After a week or two the pupa becomes an adult. The adult flea may remain in the cocoon for up to 5 months, but when stimulated by a passing animal the adult can emerge within seconds. Long-vacant homes or apartments can “come alive” with such fleas when new inhabitants move in.

Animal and human health

Fleas can be a source of both irritation and disease. Dogs and cats scratch constantly when heavily infested, resulting in soiled and roughened coats and, sometimes, in nervous conditions. The most serious effects occur when a pet develops an allergy to flea bites. As few as one or two bites can cause severe itching and scratching in allergic pets.

Cat fleas do not normally live on humans but do bite people who handle infested animals. Flea bites cause small, red, itchy bumps, usually on the ankles and lower legs. People with allergies to flea bites suffer from hives, rashes, or generalized itching. Allergic reactions usually appear 12 to 24 hours after a bite and may last a week or more.



Flea life cycle. (Illustration courtesy of Novartis Corp.)

Fleas that have fed on rodents may transmit diseases, including plague and murine typhus. For this reason, avoid close contact with wild rodents such as squirrels, rats,

and prairie dogs. Their fleas can bite you and may transmit disease. Cat fleas, however, do not carry plague.

Control

An integrated flea control program includes good sanitation and treatment of the pet and environment. You can eliminate fleas from your home with proper treatment, but it may take time, especially if the infestation is heavy.

Sanitation. Change pet bedding regularly and vacuum thoroughly. Vacuuming removes up to 30 percent of the larvae and up to 60 percent of flea eggs from a carpet, as well as the larvae's food supply of dried blood.
Vacuum under furniture, cushions, chairs, beds, and along walls. Discard vacuum cleaner bags at least once a week. Fleas can continue to develop inside vacuum cleaner bags and re-infest the house.

Treating Pets. Your pet's first line of defense against fleas is a flea comb and a good bath. Soap acts as a gentle insecticide and helps control light infestations on your pet.

Fleas, but no pets?

Buildings sometimes become infested with fleas even when there are no pets around. Other animals such as bats, roof rats, squirrels, raccoons, and wild dogs and cats commonly nest in structures and may be the source of an infestation. An experienced pest control company can treat fleas and seal openings through which wildlife may enter your home. Though time consuming, combing helps reduce the need for insecticides. Flea combs have fine teeth that remove adult fleas from fur. Most dogs and cats seem to enjoy this treatment; pay special attention to the face and neck, and the area in front of the tail. Dip the comb frequently in soapy water or an alcohol solution to kill fleas removed from the pet.

Insect growth regulators, or IGRs, are a safe preventative treatment for fleas. These products work by disrupting the normal development of flea eggs and larvae. When exposed to IGRs, adult fleas are unable to reproduce; eggs fail to hatch, and larvae die before they complete their development. Because most IGRs kill only eggs and larvae, they do not eliminate adult fleas quickly. For this reason, they are usually mixed with a mild insecticide.

Insect growth regulators are available as sprays, spot-ons, pills or food additives. One product designed for internal use is called Program® (active ingredient: lufenuron). Program® can be given as a pill (for dogs), food additive (for cats), or injection (for cats). A similar product, Sentinel®, contains lufenuron plus a heartworm preventative. These products are available only through veterinarians. They are very effective, particularly for indoor pets.

Two other insect growth regulators for topical use are methoprene and pyriproxyfen. Methoprene is sold under several trade names including Precor® and vIGRen®. Methoprene and pyriproxyfen are available at pet stores as dips, pet sprays, spot-ons and flea collars. Control requires 4 to 6 weeks.

For severe flea problems, an IGR treatment may not be quick enough. Use a product that kills adult fleas, such as imidacloprid (Advantage™) or fipronil (Frontline™). Both products have low toxicity to mammals and pose little risk to pets or people. Advantage™ and Frontline™ provide 1- and 3-month protection from fleas, respectively. Frontline™ also kills ticks for up to 1 month after application. Both Advantage™ and Frontline™ are available from veterinarians as spray and spot-on treatments.

Spot-on treatments (pesticides applied to one or more spots on the animal's back) control adult fleas effectively. Natural oils on the fur help transfer the pesticide to all parts of the pet's body. With all products, read and follow label directions carefully. Products designed for use on adult dogs should not be used on puppies or cats, unless specified on the label.

Botanical (plant-based) insecticides kill adult and larval fleas and are relatively low in toxicity. Botanical insecticides include pyrethrum (or pyrethrins) and citrus oil extracts (limonene and linalool). Use botanical insecticides with care. Though usually safe when applied according to label directions, some pets (especially certain cat breeds) are sensitive to botanicals–especially citrus oil products.

It is sometimes claimed that garlic, Brewer's yeast, cedar bedding and various herbal sachets control fleas, but there is little scientific evidence to support such claims. Volatile oils in fresh cedar chips are toxic to fleas, but the effect lasts a very short time. Tests have shown that Brewer's yeast does not protect pets from fleas.

Treating homes. The pet's living areas should be treated at the same time that the pet is treated. This kills immature and newly emerging fleas and prevents re-infestation of the pet.

Tapeworms and fleas

Cat fleas sometimes carry an intestinal parasite called dog tapeworm, *Diphylidium caninum*. The dog tapeworm has an interesting life cycle. It lives in the intestinal tracts of dogs, cats and sometimes humans. These long, flattened worms consist of up to 200 body segments (called proglottids) and may reach a length of 12 inches (30 cm). When mature, these segments detach from the main body of the tapeworm and wriggle from the anus of an infected animal. Fresh tapeworm segments are opaque white or pinkish white, flat, and somewhat rectangular. When newly emerged, they move with a stretching-out and shrinking-back motion. When dry, the segments are yellow or off-white, less than 1/16th inch long, rice-shaped sacs. Each sac contains tapeworm eggs. Tapeworm egg sacs are frequently seen attached to hairs around the pet's anus, in feces, or in the bedding of infested pets. Flea larvae feed on tapeworm egg sacs. Once inside the flea, the tapeworm eggs hatch and the flea becomes infested. Infested adult fleas carry a stage of the tapeworm that can mature and multiply if the flea is swallowed by a pet. During grooming, pets often ingest such tapeworm-infected fleas. Once released into the pet's digestive tract, tapeworms mature into adult forms. On rare occasions, small

children may ingest fleas and become infested in this way. If you see proglottids in your pet's feces or bedding, you should have your pet treated. Veterinarians can prescribe pills or injections to safely treat tapeworms in pets.
Several low-toxicity treatments are available for indoor use. Citrus sprays containing limonene or linalool can be applied to rugs, carpeting and pet bedding. These products kill fleas on contact but evaporate quickly and leave little residual protection against emerging fleas.

Boron-based products, such as disodium octaborate tetrahydrate, can be used on indoor carpeting and have little skin (dermal) toxicity. Borates kill immature fleas by contaminating their food supply. Because adult fleas feed on fresh blood only, boron insecticides do not control this life stage. Borate treatments are best applied as shampoos to avoid problems with dustiness, abrasion to carpets, and contamination of furniture or food preparation surfaces.

The insect growth regulators methoprene and pyriproxyfen can be used indoors. Although methoprene is unstable in sunlight, it is an effective indoor treatment. Pyriproxyfen sprays, available to pest control professionals under the trade names Archer™ and Nylar™, can be applied both indoors and outdoors. Pyriproxyfen controls both immature and adult fleas. Indoors, treat pet loafing and sleeping areas, and in and under nearby furniture. Outdoors, treat only flea breeding sites such as bedding areas, the ground under decks and shrubbery, and wherever pets spend a lot of time. Well maintained lawns in sunny sites are unlikely to harbor many fleas. Suitable consumer products for indoor and outdoor treatments are listed in Table 1.

Follow-up. Because flea pupae are hard to kill with insecticides, an additional follow-up treatment is usually needed 7 to 10 days after the first application. When using short-residual insecticides such as pyrethrins, two or three follow-up sprays at 5- to 10-day intervals may be required.

Biological and Mechanical Controls

Fire ants and other predatory insects eat flea larvae, but they do not control fleas completely. Several kinds of predatory nematodes (a type of microscopic worm) are sold for outdoor flea control, but their effectiveness has not been well tested. Studies suggest that nematodes work best in sandy soils. Irrigate with 1/4 to 1/2 inch of water before and after application. This prolongs nematode survival and helps them move through the soil in search of flea larvae.

Several kinds of flea traps are available from pest control companies and pet stores. The most effective designs use a special green light that blinks occasionally to simulate the shadow of a passing host. Most attract fleas to a sticky card, where they are trapped. Place traps near pet beds and loafing areas for best control. By themselves, traps are unlikely to solve most flea problems; however, they can be a useful part of an integrated flea control program for your home.

Don't wait until fleas get out of hand. Begin your flea control program early for the best results. Start a frequent and thorough sanitation program, regularly inspect your pet for fleas, carefully follow the label directions of the insecticide product you choose and dispose of all pesticides safely. These steps will help you reduce the need for extra pesticide treatments.

The information given herein is for educational purposes only. Reference to trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas Agricultural Extension Service is implied.

Safety Considerations

Be sure to read pesticide labels carefully. Products that are safe for dogs may not be safe for cats, puppies and kittens. Generally, pets less than 4 weeks old should not be treated directly for fleas. It's important to wear the proper protective clothes when applying pesticides. Long pants, a long-sleeved shirt, socks and shoes are the minimum. Check the pesticide label for additional safety requirements. When mixing liquid pesticides wear unlined, chemical resistant gloves. Allow pesticide sprays to dry thoroughly before letting people or pets into a treated area.

Never dispose of flea dips or other unused pesticides in storm sewers, toilets or sinks. This pollutes the environment and can result in costly clean-ups for your community. Leftover flea dip may be poured onto a grassy area for biological degradation or disposed of in some other manner as specified on the label.

Working with a Pest Control Company

Sometimes it's best to have professional help when dealing with fleas. A pest control company can treat both indoor and outdoor areas.

- Before having your home professionally treated, vacuum carpets and clear toys and clothing from areas to be sprayed. Vacuuming helps straighten fibers and prepare the carpet to receive treatment. Plan to stay off treated carpets until sprays have thoroughly dried, usually at least 2 hours.
- Ask the pest control operator to use the least toxic materials necessary to do the job. Use insect growth regulators for long-term control.

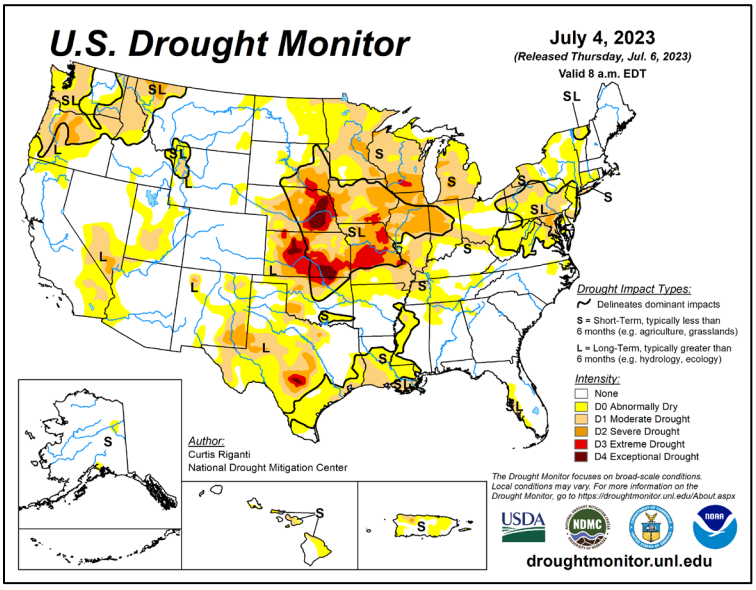
Table 1. Common, effective household insecticides for control of fleas.

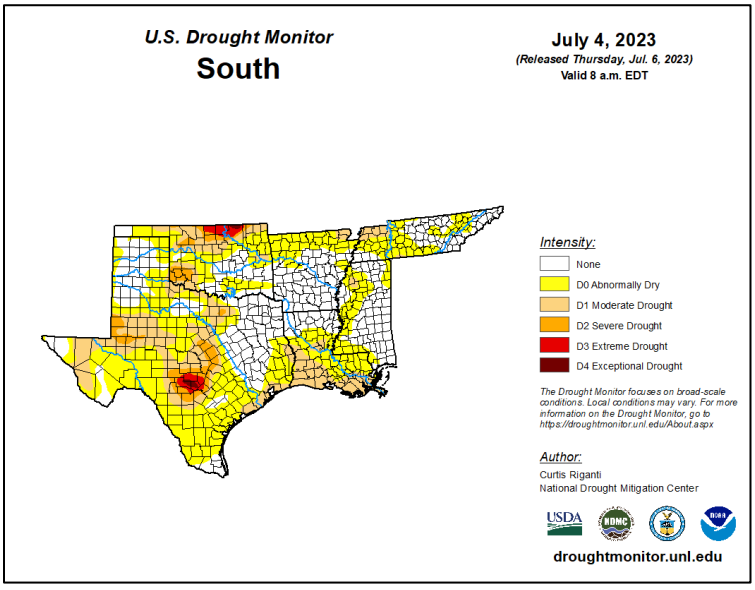
Active ingredient (trade name)*	Formulation	Area of use
carbaryl (Sevin)	spray, dust	outdoor, pet treatment
chlopyrifos (Dursban)	spray, granule**	outdoor
d-limonene (Demize)	spray	indoor, pet treatment
diatomaceous earth	dust	pet bedding
diazinon	spray, granule**	outdoor
malathion	spray, dust	outdoor
methoprene (Precor, Ovitrol, Petcor, vIGRen)	spray, wipe-on, collar	IGR indoor, pet treatment
propoxur (Baygon)	spray, dip, collar	outdoor, indoor, pet treatment
pyrethrins	spray, shampoo, dip	indoor, pet treatment
pyriproxifen (Archer, Nylar, BioSpot)	spray, shampoo, dip, spot-on	IGR outdoor, indoor, pet treatment

*Trade names are registered® or trade marked™.
**Use liquid rather than granular formulations for best control of fleas outdoors.

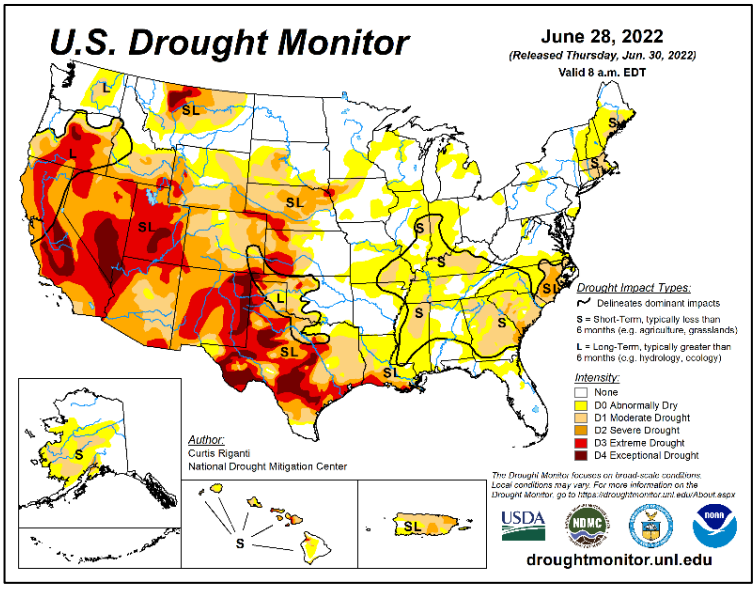
Current US drought monitor 2023 vs. 2022

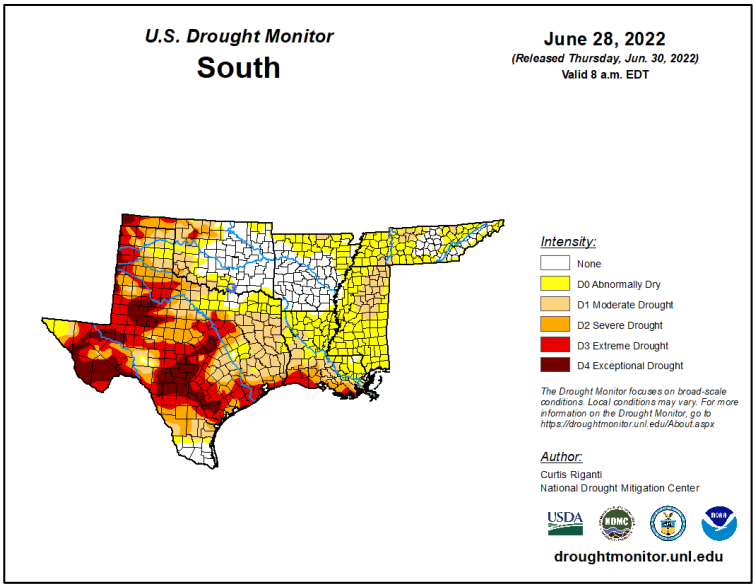
2023





2022





Plants, insects, and diseases active now

Plants

Warm season weeds like crabgrass, foxtail, woolly croton (doveweed; goatweed), ragweed, johnsongrass, and pigweed are at or near maturity and beginning to suffer from the hot weather. New flushes of annual weeds are occurring in areas that have received recent rainfall (picture below). In many cases Johnsongrass is putting on a seedhead in the bar-ditches and in some fields. Nightshades like silverleaf nightshade, buffalobur, ground cherry, and Horsenettle are mainly in reproductive stage. Foxtails, dallisgrass, and crabgrass are at reproductive maturity. Post emergent herbicides should be applied as soon as possible for broadleaf or grass weed control in pastures or hay meadows. Avoid applications to drought stressed or heat stressed weeds or brush.

Insects

Tent worms, fall web worms, and other tree pests are increasing across the area. Increasing grasshopper populations in some areas with the with the warmth and moisture. Sorghum head worms (fall armyworms and corn earworms in sorghum) are at treatable levels. No armyworm or cutworm issues have been reported in pastures but could be coming soon.

Diseases

No real disease issues currently in any crops.

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Goatweed stages in the same square foot in Bonham, TX on July 7, 2023. (Photo Courtesy of Colton Spencer, Corteva Agriscience).

Events Coming Up

July 21

SCAN ME

- Tri-County Healthy Lawns and Healthy Waters Program (*Bonham*) https://hlhw.tamu.edu/workshops/2023/july-21t-bois-darc-lake-watershed-collin-fannin-and-grayson-counties/

Aug 7-9

- Beef Cattle Short Course (*College Station*) https://beefcattleshortcourse.com/

Aug 25

- Fall and Winter Tree Health Clinic (*Sherman*)

Sept 15

- Cow-Calf Production Clinic (*Sherman*)

Visit our website at Welcome to Grayson County - Grayson (agrilife.org) to sign up for the events, unless otherwise noted.