

Texas A&M AgriLife Extension Orange County Agriculture Newsletter

October-November-December 2016

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Orange, TX 77630
Phone: 409-882-7010
Fax: 409-745-9889

Upcoming Events

October 25th—Beef Symposium,
Winnie/Stowell Community Building,
Winnie, TX

November 2—Private and Commercial
Pesticide Training, 11 am—3 pm, Ex-
tension Office

November 2—CEU Update, 11 am—3
pm, Extension Office

December 15—Town & County 7 hr
CEU Conference

Meetings:

First Thursday of the month: Apiary
Committee at Extension Office; 6pm

Second Thursday of the month: Master
Gardener at Extension Office; 6pm

3rd Thursday of the Month: Texas
Master Naturalist; October 20th meeting
will be held at the Extension Office;
6pm to 8pm



Word from your Ag Agent

Howdy Orange County! It seems summer has left us and winter is approaching... I have gathered a lot of articles on what I think is useful information based on the questions we get. We have a lot of information this quarter for you and I hope you enjoy it! Several programs coming up, plenty of CEU opportunities, Zika virus information, and much more! If you ever have a question let us know, or maybe a topic you would like me to cover! Chances are if you want to know so does someone else!

However, many of the problems you face others in the county are facing. I, along with our Orange County Master Gardener Hotline, have come up with some resources for this issue to tackle our most frequent concerns. As always, feel free to call or come by with any questions you may have!

- Have a question? Need a Soil sample? Call for a site visit from your Ag Agent!
- Need a plant, weed or bug identified? Email picture to Extension@co.orange.tx.us or Ashlee.krebs@ag.tamu.edu
- Want to be receive the Ag Natural Resources Newsletter? Contact us to be put on the email list for FREE!!!

Farming and Ranching

Pond Management

Many ponds are being taken over by several aquatic weeds. However, the type of aquatic vegetation you may have, and your goals for your pond depend on what you would apply to control. Dragging ponds to rid it of the weeds may seem great at first, but many times you actually cause the weeds to multiple tenfold by doing so. Grass carp on some varieties can be effective in control of pond weed management. Most weed control in ponds can be more cost effective by spot treatment around docks, and swimming areas versus the entire pond. A Diquat plus Chelated Copper has been extremely effective in weed management of ponds. However, correctly identifying the aquatic vegetation you have and following the label is the first step in controlling pond weeds. Pond management just like pastures requires routine maintenance year round. I have attached the annual calendar below:

EWF-003
Revised May 2013



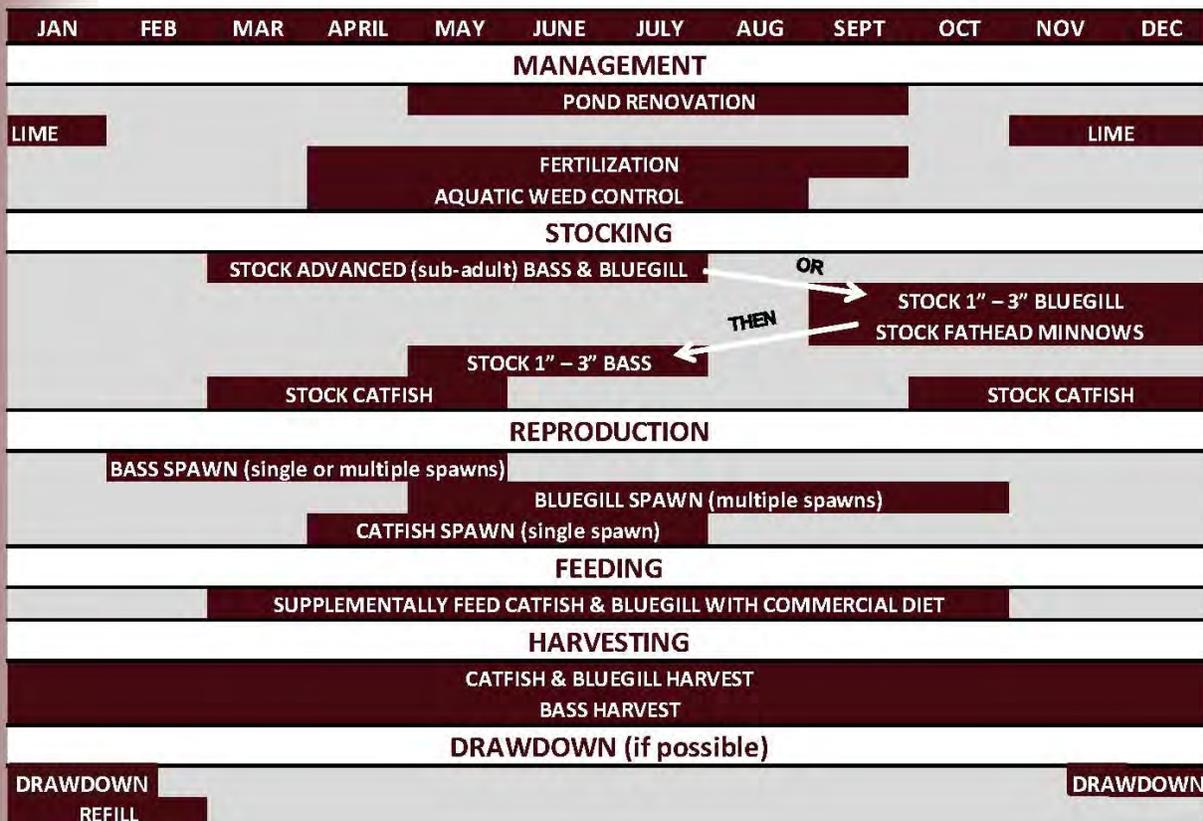
TEXAS FARM POND MANAGEMENT CALENDAR

Billy J. Higginbotham

Professor & Extension Wildlife & Fisheries
Specialist

Todd D. Sink

Assistant Professor & Extension Fisheries
Specialist

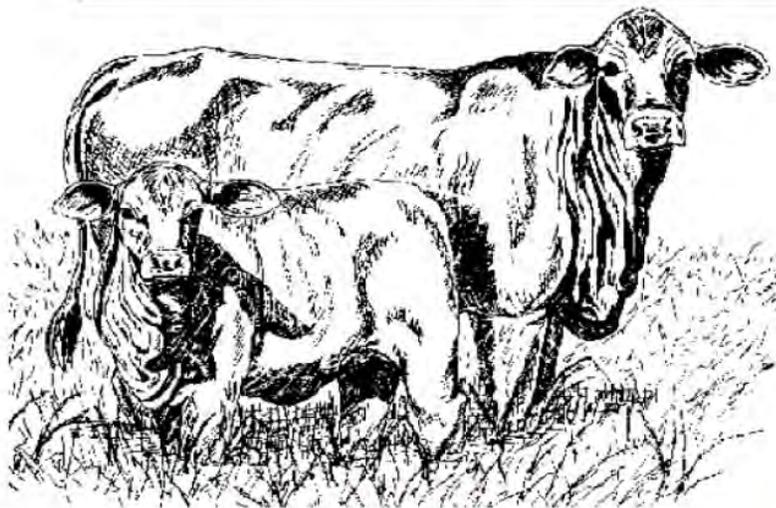


*Improving Agricultural Production in
Southeast Texas*

CEU Hours!

Southeast Texas Beef Symposium and Trade Show October 25, 2016

- Hands On presentations
- Trade Show with local Vendors
- Hay Judging and Plant ID Contest
 - Soil Testing (1 free)
 - Water Testing (1 free)
- Registration opens at 10:00 am—\$20 at door, includes Lunch!
- Please call 409-374-2123 for more information or to RSVP!



TEXAS A&M
AGRILIFE
EXTENSION

**Winnie/Stowell Park
Community Bldg
335 South Park St.
Winnie, TX 77665**

A collaboration of
**Chambers, Hardin,
Jefferson, Liberty, Orange,
and San Jacinto Counties**

Ag Extension Office
1225 Pearl St., Suite 200
Beaumont, Texas 77701
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Farming and Ranching

Choosing the Time of Year to Breed and Calve Beef Cows in Texas

L.R. Sprott*

As any cattleman knows, the time of year when cows calve directly affects many herd management practices:

- The start of calving is dictated by the start of breeding.
- Cows calving in the fall normally need more supplemental feed in the winter, unless cool season pastures are used, than do cows that calve in the spring.
- Fall-born calves will be marketed in the spring and calves born in the spring will be marketed in the fall unless the producer can retain ownership of calves past weaning.

These few differences in management indicate that a producer should give careful consideration to the time of year in which to calve cows. The decision of when to calve is complicated by numerous factors and, in many instances, inattention to details can dramatically affect costs of production, animal performance, income and profitability.

Things to Consider

The first thing to realize is that there is no single date that is best for the start of calving. However, there



are breeding and calving dates that probably should be avoided because differences in climate in regions of Texas can affect the availability and conditions of pasture needed for nutrition of pregnant cows and calves.

There are a few principles about fertility in cows that a producer should consider in deciding when to breed and calve the herd.

Principle 1—Regardless of management influences, fertility among cows is variable. Table 1 shows that fertility is highest in cows that conceive at first service, and it is clear that cows requiring more than two services during the breeding period are the least fertile in the herd.

Principle 2—It is important to properly feed cows so that they can show estrus early in the breeding period. Table 2 shows that cows that display estrus within the first 21 days of breeding have higher pregnancy rates compared to cows displaying estrus after the first 21 days of breeding. Consequently, pregnancy rates are high in herds that have a high proportion of cows showing estrus early in the breeding period.

Principle 3—Most of the pregnancies within a herd occur in the cows with highest fertility. Table 3 shows that 95 percent (Trial 1) to 97 percent (Trial 2) of all pregnancies are attributed to cows conceiving at their

*Professor, Extension Beef Cattle Specialist and Research Scientist, The Texas A&M University System

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first or second estrus. Only 3 percent (Trial 2) to 5 percent (Trial 1) of pregnancies are attributed to cows that conceive at their third estrus.

Consider these principles regarding cow fertility in deciding when to start breeding. It could increase the chances that the most fertile cows will conceive and ensure high pregnancy rates.

Table 1. Pregnancy rate in cows requiring multiple services.

Number of services	Number of cows	Pregnancy rate
One	220	77.3% ^a
Two	28	35.7% ^b
More than two	67	16.4% ^c

^{a,b,c}P < .005, Sprott et al., 1998, PAS 14:231

Table 2. Pregnancy rate in cows showing estrus early in the breeding period.

Number of cows	Time of estrus	Pregnancy rate
220	First 21 days	81.8% ^a
65	After first 21 days	58.5% ^b

^{a,b}P < .005, Sprott et al., 1998, PAS 14:231

Table 3. Cows generating the most pregnancies in the herd.

Trial	Number of cows	Number pregnant	Percent (%) of all pregnancies occurring at:		
			1st estrus	2nd estrus	3rd estrus
1	285	229	208/229 (91)	10/229 (4)	11/229 (5)
2	251	216	177/216 (82)	33/216 (15)	6/216 (3)

Trial 1 - Sprott et al., 1998, PAS 14:231

Trial 2 - Sprott, 1999 (unpublished)

Fertility in Summer Months

Temperature and humidity during certain months are stressful and can reduce fertility. Table 4 shows that if cows exhibit their first estrus after the month of May in Central Texas (Trial 1) or April in the Gulf Coast

region (Trial 2), the chances of conceiving are dramatically reduced.

Results, at either location, showed pregnancy rates were less than 17 percent in cows displaying their first estrus during July through September. That indicates that summer breeding in these two regions of Texas is not recommended.

Research has shown that this reduction in fertility is a result of heat stress brought on by high temperature and humidity that combine to raise the temperature/humidity index. Heat stress in cows is known to cause hormone imbalances, reduced quality of ova, early embryo death and reduced blood flow to the uterus. These factors, either singly or in combination, result in low fertility. Likewise, bulls also are affected by heat stress that causes sperm cell quality to decline. As a result, when heat stress occurs, its negative effects on fertility in both the cows and bulls reduces the chance of pregnancy.

Similar studies have not been conducted in other areas of Texas, but it appears that late summer rains and low humidity in areas of West Texas allow producers in that region to breed their cows during summer months without experiencing major reductions in fertility. In contrast, high humidity in eastern, southeastern and Gulf Coast regions of Texas suggests that summer breeding may not be advisable.

Fertility in Winter Months

Unfortunately, data concerning pregnancy rate at first estrus during the cold months in Texas are not available. However, Table 5 shows that Central Texas cows exposed for breeding during November, December and January have acceptable reproductive performance. Note that the lower pregnancy rates in Herd 1 (1989,1990) and Herd 2 (1988, 1989) were attributed to nutritional problems. Pregnancy rates improved when the herd owners corrected their management practices. If nothing else, data in Table 5 indicate that proper nutrition is required and that temperatures during Central Texas winters are not so stressful that fertility is compromised.

Table 4. Fertility at first estrus during spring breeding as affected by month (Texas).

Trial	Pregnancy rate (%) by month				
	April	May	June	July	July - September
1	—	180/220(81.8)	38/65(58.4)	11/67(16.4)	—
2	31/41(75.7)	13/29(44.8)	10/22(45.4)	—	3/19(15.8)

Trial 1 - Sprott, et al., 1998, PAS 14:231; May vs June, P < .005, June vs July, P < .005 (number of cows - 285);

Trial 2 - Sprott, 1999 (unpublished, Brazoria County, TX), P < .005 (number of cows -111)

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Table 5. Pregnancy rates (%) in central Texas cows bred in the fall (Nov., Dec., Jan.).

	Year					
	1988	1989	1990	1991	1992	1993
Herd 1 (Fayette County)	—	74	76	86	94	93
Herd 2 (Hays County)	87	83	92	91	—	—

Herd 1 - 107 cows
Herd 2 - 35 cows

Calf Performance as Affected by Month of Birth

Table 6 shows the effect of month of birth on calf performance. These data were taken from more than 8,000 calves born in the central, southern and Gulf Coast regions of Texas. In general, the information can be applied to herds in the eastern, southeastern, south central and southern regions of Texas.

The data show that growth performance drops in calves born in May through September. Calves born in those months had adjusted weaning weights (to remove age bias) below that of calves born in cooler months. Peak performance occurred in calves born in March (Trials 1 and 2) or April (Trial 3) and declined for all calves born from May through September by as much as 56 (Trial 1), 79 (Trial 2), and 124 (Trial 3) pounds. The information presented in Table 6 should not be used to target a specific month to calve because there is some variation in the data between locations.

It can be concluded that high temperatures are very stressful on summer-born calves and will reduce their growth. Unless a producer retains ownership of summer-born calves to feed through the winter, the calves are unlikely to generate acceptable income. Even then, data from a fourth Gulf Coast herd with summer calves (not shown) revealed that growth rate in summer calves was low, which forced them to be kept until 12 months of age to reach an acceptable sale weight that their herd mates reached at 7 months of age.

Table 6. Effect of month of birth on adjusted weaning weight in calves.

Trial	Month of Birth											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	388	427	430	417	416	—	—	374	424	—	478	465
2	477	491	477	467	432	424	434	414	398	432	447	474
3	361	394	415	438	396	—	341	314	320	349	359	357

Trial 1 - Burleson County, 1976
Trial 2 - Webb County, circa 1969
Trial 3 - Calhoun County, 1976-1979

If calves born in cooler months perform better than those born in summer, then what effect is there on performance of calves born in the cold of December, January and February? Table 6 shows that calves born in those months also suffer, but not to the same degree as those born in hot months. Cold may negatively affect calf performance, but the degree of cold stress in central, southern and the Gulf Coast regions of Texas is not high enough to eliminate calving in the fall and winter.

This is completely contrary to the effects of cold on performance in winter-born calves in northern states where temperatures are more severe and high death loss and the potential for low growth rate in calves are major concerns. Perhaps the most important thing to conclude from data in Table 6 is that stressful temperatures of both cold and heat will affect calf performance, and summer calving is not recommended in the eastern, central, southern and Gulf Coast regions of Texas.

Effects of Cow Size on Choosing When to Calve

Cow size is an important consideration in choosing when to calve. Data from an Arkansas trial show that calf performance and profits are best in small to medium frame cows that calve in the fall compared to spring months. Even though feed costs increased for these fall-calving cows compared to those calving in spring, the value of higher performance in their calves justified the higher feed costs and resulted in higher profits.

To the contrary, large frame cows that calved in the spring had higher profits than when calved in the fall. The reason was that supplemental feed requirements for the fall-calving cows were so high that the value of performance in their calves did not justify the high feed costs. These data suggest that unless alternative nutritional management steps can be taken to reduce feed costs in large frame, fall calving cows, it is best to calve such cows in the spring.

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Conclusions

The data presented do not clearly identify a specific month to calve and breed cows in Texas, but there is no question that summer calving (May through September) in the eastern, central, southern and the Gulf Coast regions of Texas will result in significantly reduced calf performance. A drop in calf performance ranging from 56 to 124 pounds (Table 6) in summer-born calves probably is not economically acceptable to a producer.

In six other Texas trials, management steps to eliminate summer-born calves and concentrate the calving season in the cooler months of spring or fall resulted in an average 74 percent increase (range of 27 percent to 150 percent) in production.

It also is clear that fertility in cows bred in July through September (Table 4) drops. Depending on location, cows (Texas Gulf Coast region) bred in May

and June had pregnancy rates approximately 30 points below those bred in cooler months, while cows in the central and Gulf Coast regions bred from July through September had pregnancy rates from 60 to 65 points below cows bred in cooler months.

The lack of data on calf performance and fertility for cows in West and North Texas prevents any statement about the appropriate months to calve and breed in those regions. But summer breeding and summer calving in eastern, central, southern and the Gulf Coast regions of Texas is not recommended.

Acknowledgment

The author expresses his thanks to Dr. Tom Troxel, Cooperative Extension Service, University of Arkansas, for supplying data on cow size.



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Farming and Ranching

Annual Winter Pastures for East Texas

J. Vendramini, G.W. Evers, and L. Redmon
Soil and Crop Sciences Department

Warm-season perennial grasses dominate most of the pastures in East Texas, but climatic conditions allow for use of cool-season annual grasses and legumes, either overseeded or in prepared seedbeds, in the fall for winter and spring grazing. Reasons for use of cool-season annual forages include extending the grazing period and improved animal performance due to their high nutritive value. Although cool-season annual forages can be expensive to plant and grow, they can be a less costly substitute for energy and protein supplements purchased off the ranch.

Species, Varieties and Seeding Rates

Ryegrass

Annual ryegrass, a high-yielding, nutritious grass, is the most widely grown cool-season annual forage in the southern and southeastern USA. It is adapted to most soils and tolerant of wet, poorly drained soils. Ryegrass is very responsive to N fertilization with the peak growth occurring during the spring. Ryegrass produces forage that is high in nutritive value, and thus, provides excellent animal performance. Ryegrass also tolerates close grazing, although if repeatedly grazed too closely, growing animal performance will

be reduced. When overseeded on warm-season grasses, producers must be prepared to utilize the rapid spring growth, otherwise it will significantly delay the subsequent warm-season grass growth.

Pure stands of ryegrass should be seeded from 25 to 30 lb/acre. There are several varieties of ryegrass adapted to East Texas. The 3-year average forage yield results of the ryegrass variety trial conducted at the Texas A&M Agricultural Research and Extension Center-Overton TX are shown in Table 1.

Table 1. Three-year average (2001-02 to 2004-05) dry matter yield of annual ryegrass at Overton, TX (Nelson and Crowder, personal communication)

Variety	Yield (lb./ac)
Jumbo	7474
Prine	7358
Marshall	7126
Ed	7067
Jackson	6744
Brigadier	6570
TAM 90	6556
Passeral Plus	6552
Gulf*	6375
WD-40	6256
Ribeye	6200

Annual fertilization 244 lbs./ac. of N, 131 lbs./ ac. of P2 O5 and 131 lbs. ac. of K2 O.
* 2 year average 2001-02 and 2002-03

Small grains

Small grains are usually mixed with annual ryegrass to improve late autumn and winter forage production. Small grains are more productive from late autumn to mid-February than annual ryegrass. Small grains are high in nutritive value and provide good animal performance over their growing season when grazing is managed to keep the small grains in the vegetative stage of growth. When mixed with annual ryegrass, the mixture provides the longest grazing season and the highest level of forage production. Small grains provide the majority of the forage production from November to February and ryegrass will predominate from March to late May. Small grain seeding rates used in East Texas ranges from 90 to 100 lb/acre when planted in pure stands or mixed with annual ryegrass.

Rye (cereal rye; *Secale cereale* L.) is the most winter hardy of the small grains and is well adapted to sandy soils. Rye produces grazable forage earlier after seeding; however, it is also the earliest maturing. The most widely planted rye varieties in East Texas are Maton, Oklon, Elbon, and Bates.

Wheat is similar to rye in forage yield but somewhat less cold hardy and several weeks later in

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maturity. Wheat is more adapted to loam-clay soils and is used in the northwest and north-central part of the State. In addition, wheat is commonly used as a dual purpose crop for both forage and grain. Among the varieties planted in East Texas are Sisson, Roane, Pioneer 25R57, and Pioneer 25R78.

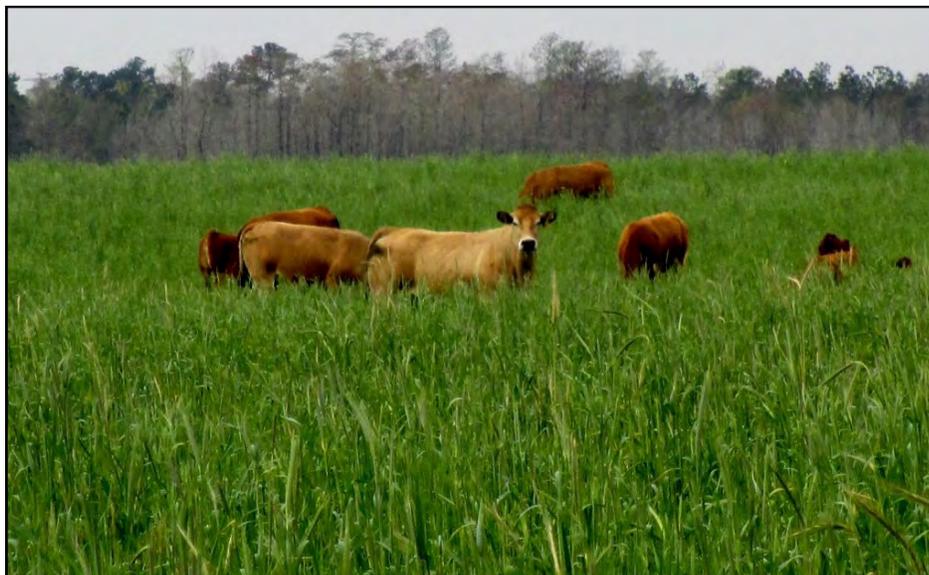
Although oat will provide earlier fall grazing and more forage in warm weather than rye and wheat, it is the least cold hardy of the small grains, and in some years stand loss from severe cold greatly reduces forage availability. Oat matures several weeks later than wheat. The primary growing area is central Texas and south Texas. The most planted varieties are Dallas, Chapman, and Heavy Grazer 76- 30.

Clovers

Cool-season legumes make most of their growth in the spring when temperature and rainfall are favorable. Most of the legumes adapted to East Texas are annual legumes and should be reestablished from seed each fall. Some clovers such as arrowleaf, ball, rose, and white clover (a true perennial that acts like an annual in much of Texas) produce a high percentage of hard seed which allows them to reseed if managed properly. Coolseason legumes are high in nutritive value and when grazed by beef cattle provide excellent animal performance. Cool-season legumes can be grown in mixtures with annual ryegrass. The ryegrass provides

earlier grazing and decreases potential bloat caused by legumes. Mixtures of clovers and small grains are not usually recommended because the faster autumn growth of small grains shades the clover seedlings and decreases clover stands and production.

plant material that is returned to the soil and by grazing livestock that return over 90% of the consumed nutrients to the soil through the feces and urine. If the clover crop is removed from the pasture as hay, haylage, or silage, the legume N contribution is reduced.



En.r8lst.com

Clovers are an attractive option to decrease the production cost associated with N fertilization because legumes have the ability to fix atmospheric N. Annual clovers can contribute about 75- 100 lbs N/acre for the subsequent grass crop. They are, however, only able to fix N from the air if specific strains of Rhizobia bacteria are present in nodules on their roots. To ensure that the best strain of Rhizobia is present for each clover species, the seed must be inoculated with the proper Rhizobia strain before planting. Pre-inoculated seed of most legume species is available. The majority of N in legumes is transferred to the soil by unused

Because cool-season legumes are more site-specific than grasses, producers must know their soil type and select the best adapted legume species. Clover species grown in East Texas, their preferred soil requirements, plants characteristics, and recommended seeding rates are shown in Table 2.

For more on winter pastures and to see the rest of this article go to:

<http://forages.tamu.edu/PDF/SCS2006-05-02.pdf>

Establishing Cool-Season Annual Grasses

Vanessa A. Corriher
Extension Forage Specialist
Overton, TX

Cool-Season Annual Grasses Establishment Options:

	Seeding Rate (lb/ac)	Planting Depth	Months of Use
Ryegrass Only	25-30	0-0.5 in.	Feb to May
Small Grain Only (Oat, Rye, Triticale, Wheat)	80-120	1-1.5 in.	Dec to April
Ryegrass and Small Grain	20-25 ryegrass + 80-120 small grain	See above	Dec to May
Ryegrass and Legume*	15-20 ryegrass + 2/3 of pure stand seeding rate legume	0-0.5 in. (ryegrass) 0-1.0 in. depending on legume	Feb to May

* For legume establishment see "Forage Legume Management Guide."

Planting Date, Method and Fertilization

1. Prepared Seedbed
 - Obtain a soil test to assess needs of limestone, nitrogen, phosphorus, and potassium, or nutrients.
 - Destroy existing vegetation by disking and then rolling (packing) to provide firm seedbed for planting and moisture retention.
 - Phosphorus and/or potash fertilizer can be applied before or at time of planting.
 - Plant cool-season grasses from mid-September to early October before a good chance for rainfall.
 - Nitrogen fertilizer is usually split-applied, and depending on soil test recommendations, may require 1 to 3 split applications at 50-60 lbs N/ac. Delay initial N application until after grass emergence.
2. Light Disking (1-2" deep)
 - Provides loose soil to cover seed and reduces warm-season grass competition.
 - Use on bermudagrass and bahiagrass pastures.
 - Warm-season grass needs to be short (less than 4"; grazing, hay harvest, mowing, etc.).

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- Plant cool-season annual grasses 4 to 6 weeks before the average first killing frost, which usually occurs in November.
 - Seed are planted with a drill or broadcast followed by some type of pasture drag to cover seed
 - Phosphorus and potash fertilization should be based on soil test recommendations and applied 2 to 3 weeks post emergence if not applied prior to or at time of planting.
 - Initial nitrogen fertilizer application should be delayed until after the cool-season grass is established and cool temperatures have reduced warm-season grass growth.
 - Nitrogen fertilization is dependent on soil test and may be split in 1 to 3 applications of 50-60 lbs/acre.
3. Overseeding or Sodseeding into Undisturbed Sod
- Warm-season grass needs to be short (less than 4"; grazing, hay harvest, mowing, etc.).
 - Planting date is several weeks later than other planting methods to reduce warm-season grass competition.
 - Requires sod seeder (no-till drill) if planting small grain or may be accomplished with fertilizer truck.
 - Broadcasting into an undisturbed sod is usually limited to annual ryegrass and small seeded clovers (ball, white, etc.).
 - If broadcasting cool-season grasses, the seeding rates should be increased 25% to 30%.
 - Initial fertilizer application should be delayed until after the cool season grass is established and cool temperatures have reduced warm season grass growth.
 - Nitrogen fertilization may be split in 1 to 3 applications of 50-60 lbs/acre.
 - Phosphorus and potash fertilization should be based on soil test recommendations.

Utilization

- Best use is by young growing animals (stocker calves, replacement heifers, first calf heifers, creep grazing fall calves.).
- For fall calving cows, limit graze (2 hrs/day or 4 hrs every other day) during fall and winter as a protein and energy supplement. Increase hours/day on pasture as growth rate increases in early spring.
- Can be used for fall or winter calving cows.
- Should NOT use for dry, mature cows due to high costs.

For more details on legumes see "Forage Legume Management Guide." For more details on winter pastures see "Annual Winter Pastures for East Texas." SCS-2006-05. Or visit our websites at: <http://soilcrop.tamu.edu> or <http://overton.tamu.edu>.

WALNUT CATERPILLAR

Bill Ree, Extension Program Specialist II-Entomology
 and Marty Jungman, Extension Agent-IPM,
 The Texas A&M University System

The walnut caterpillar feeds on a wide range of woody shrubs and deciduous trees in the walnut family (Juglandaceae). Its primary hosts include pecan, black walnut, English walnut, Japanese walnut, Persian walnut, butternut, and hickory.

The walnut caterpillar, *Datana integerrima* (Grote and Robinson), is native to North America and ranges from the eastern United States to as far west as Minnesota, Oklahoma, Kansas and Texas.

Biology

The walnut caterpillar overwinters as pupa in the soil under and around the host plants. Adult moths emerge during the late spring and females deposit a mass of 600 or more eggs on the undersides of leaflets (Fig. 1). These egg masses are laid in a single layer and have no scales or hairs. Each female moth will deposit eggs only once during her lifetime.

After approximately 9 days, larvae emerge from the eggs and begin feeding on the foliage. Young larvae skeletonize the leaf by feeding only on the leaf surface—older larvae consume the entire leaf, leaving only the leaf stalk or petiole (Fig. 2). Larvae feed for approximately 23 days, during which they go through five stages (instars).



Figure 1. Walnut caterpillar egg mass



Figure 2. Branch terminals defoliated by walnut caterpillar

Unlike the larvae of some leaf-feeding caterpillars, walnut caterpillar larvae do not build webs. During the first four larval stages, the reddish-brown larvae feed as a colony so damage will likely be localized on a few branches. It is common to find several hundred larvae feeding on a single terminal (Fig. 3). When the larvae



Figure 3. Colony of late instar larvae



Figure 4. Cast skins from colony molt on side of tree trunk

are ready for the fifth instar, they move to a main limb or the tree trunk to molt as a group. This molt leaves a patch of cast skins on the tree trunk or limb (Fig. 4).

The fifth instar larvae are black with long white hairs (Fig. 5), and after molting they return to the canopy to feed as individuals rather than as a colony. During this 3- to 5-day feeding period, 5th instar larvae consume about 80 percent of all the foliage they will eat in their lifetime. The larvae then leave the host plant to pupate in the soil.

In Texas, the walnut caterpillar can produce two or three generations per year depending on the number of frost-free days. Two generations are possible when there are fewer than 245 frost-free days—three generations are possible when there are more than 245 frost-free days.



Figure 5. 5th instar larvae

Signs and symptoms of damage

Unlike early season caterpillars that feed on new growth, walnut caterpillar larvae prefer mature foliage. Consequently, infestations will not appear until late spring or after foliage has matured. Trees or branches that were defoliated will initiate new growth, which should not be damaged by the next generation. To help prevent significant defoliation, homeowners and commercial operators should know the following symptoms. Early detection is important so control measures can be applied before significant damage occurs.

Signs of activity:

- Localized areas of skeletonized leaves
- Colonies of reddish-brown larvae
- Foliage loss from larvae feeding
- Masses of cast skins on the tree trunk or main scaffold limbs
- Fecal material (frass) on sidewalks, driveways, equipment, and ground (Fig. 6)



Figure 6. Frass on driveway

Control

During most years, natural predators and parasites keep walnut caterpillar populations in check. Several species of wasps and flies consume egg masses and larvae, and many other insects and spiders prey upon larvae.

On small trees, homeowners can achieve some control by removing egg masses from leaves and larvae from the branches. For large trees or for large acreage, an insecticide application is the most practical way to prevent damage.

Insecticides that are recommended for homeowners will contain spinosad or *Bacillus thuringiensis* as their active ingredient. These insecticides are selective for caterpillars (Lepidoptera larvae) and very safe to humans. To increase the effectiveness of insecticides, apply them when the larvae are small and ensure that the spray covers the entire canopy. Broad-spectrum insecticides can be effective but carry some risk for the applicator and may cause secondary insect outbreaks.

Insecticide labeling is subject to change, so always consult the label for target sites and pests, application rates, and safety precautions. The user is responsible for the effects on his or her plants, as well as problems caused by drift onto adjacent properties.



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Private Pesticide License Training

November 2, 2016
11:00 am to 3:00 pm
Texas A&M AgriLife
Extension Office
11475 FM 1442
Orange, TX
409-882-7010
Lunch Provided



Private Applicator Training (PAT) is the required training for anyone pursuing a Private Applicator License to purchase and apply State-Limited-Use, Restricted Use, and/or Regulated Herbicides.

Fee: \$60 registration if purchasing books (Strongly encourage to purchase books). We will need to know 1 week prior if you are purchasing books to allow for delivery.

\$10 registration if not purchasing books.

Bring pencil/pen, note pad, calculator, and driver license.

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**TEXAS A&M
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Master Gardener

Cool Season Vegetables

Now that fall is here, this is the time of the year to start planting your cool season vegetables. Some examples of cool season vegetables are: Beets, Carrots, Spinach, Radishes, Broccoli and Cauliflower.

Select your seedlings from your favorite nursery so they will have plenty of time to grow to maturity. In Orange County, Zone 9a, these varieties will grow most if not all winter.

If you are starting a new garden, then you need to remove all grass and weeds from the area or if you are using an existing garden, just remove the weeds. Once the soil has been tilled, add organic amendments such as compost and mix well. Another easy way to build your garden bed is to use the Lasagna Gardening method (I will have instructions at the end of this article).

Beets - Two good varieties to plant are Early Wonder and Detroit Dark Red. They will be ready for harvesting in less than 2 months and you will be eating them throughout winter. Beets like deep well drained soil. Not clay, which is too heavy for the large roots to grow. If you have clay, mix with organic matter to help soften it. It's best to plant your beet seedlings when the weather is cool, as they grow best in cooler weather. Allow room between each plant so they can grow. They need to be able to reach a depth of 3 – 6 inches and away from trees. Harvesting beets can be done 7 – 8 weeks after planting. You can also harvest the greens from the beet plant while the plant is young and the root is small.

Carrots – Carrots have a sweeter taste when grown in cooler weather. Some good varieties to choose from are Imperator, & Nates Half Long of which can be harvested in 60 – 70 days. Night temperatures should be dropping to about 55° F. and the daytime temperatures should be averaging 75°F for your best growth. Carrots will tolerate a little shade, not much. Prepare your soil much the same as for beets. Be sure you have removed any trash, rocks and large pieces of bark. Finer pieces of plant material can be mixed into the soil. The best soil for carrots is a sandy, well-drained loam. Till the soil to make sure it is very loose and easier for carrots to grow. Mix fertilizer (1 cup of 10-20-10) per 10 feet of row you plant. Rows should be 1 foot apart, follow the instructions on the seed packet. Lightly water with fine mist until seedlings come up. Thin if necessary and weed to keep nutrients for carrots.

Spinach – One of fall's hardiest vegetables is Spinach and varieties such as Virginia Savoy and Dixie Market and can be harvested in just over a month. Spinach is an excellent source of Vitamin A. If you cover your Spinach during the colder times they should survive and will return in early spring to produce again. Sow your seeds directly outdoors, ½ inched deep and thin to 2 – 4 inches apart. Keep weeds to a minimum with mulch. Pick the leaves often to keep the plants producing.

Radishes – Radishes can be ready to pick in just over a month. With Champion, White Icicle they can spice up any salad along with giving it a nice color. There are many other varieties of Radishes going from the short fat reds to the long skinny whites. So pick your favorite and watch it grow fast!!! Plant about ½ inch deep in rows of loose garden soil. Sprinkle lightly with water, DON'T OVERWATER. Too much water can wash the seeds away. Germination is about 10 days with harvest about 20 days later. Tip 1: water seems to make them flavorful while lack of water seems to make them hotter. Tip 2: Water the night before harvesting and it makes them much easier to pull out of the ground. Radishes are an excellent source of potassium, Vitamin C and folate (folic acid).

Broccoli – Broccoli & Cauliflower do the best in extended cooler weather. Early Green Comet, Premium Crop & Southern Comet broccoli can be harvested about 50 – 55 days after transplanting seedlings. Broccoli does well in our area as our winters are mostly cool and moist which it likes. They like fertile, soft soil, which can hold moisture but not be sopping wet. They require soil, which is rich in nutrients. Broccoli is high in Vitamins A & C and is also considered a cancer-fighting food. Plant seeds ¼ - ½ inch deep. Plant seedlings 15 – 18 inches apart in rows 23" – 36" apart. Plant in soil rich with organic matter. Harvest in 65 – 70 days. Maintain a soil pH of 6.8 and higher will discourage club root. Good air circulation will help avoid fungal and bacterial diseases. Strong healthy broccoli plants growing in an organically rich soil will be better able to fight disease than anything else.

Cauliflower – Snow Crown & Snow King cauliflower can be harvested about 50 – 60 days after transplanting seedlings. Cauliflower does well in our area as our winters are mostly cool and moist which it likes. Plant seeds ½ - ¾ inches deep. When you plant outside, they do best in 8 – 10 inch wide rows about 36 inches apart. Rows are about 15 inches apart.

Master Gardener

First water should include a high phosphate fertilizer so plants can get a good start. Fertilize often with magnesium or the cauliflower will show signs of deficiency by acidic soil. Water weekly to produce nice heads. Harvest when the cauliflower produces a mature head fully developed about 6 inches in diameter. Cut from the plant with a large knife, leaving at least one set of leaves. Leave the rest in the ground, as it will continue to produce florets you can harvest and eat.

Both Broccoli & Cauliflower often are attacked by Cabbage worms and loopers. Best control is to remove by picking them off and destroying them. Use row covers to block out all insects including root maggots, aphids and Diamondback moths.

Lasagna Gardening as it is called is one of the simplest ways to build a garden. No you are not making Lasagna but you are layering your "ingredients" like you do when making Lasagna. It is also known as a no-dig, no-till organic gardening resulting in nice clean organic soil. The best thing you do not have to do is to remove grass, weeds and the like. This is a great to use in raised beds. There are 9 steps and just layer as follows and you will have a nice garden to plant in.

First Layer - Put down 5-8 sheets of newspaper overlapping each section and bringing up to and up the side of the bed edge to keep out encroaching weeds and grass. (Cardboard can be used but it takes longer to degrade & worms to come in) After laying your newspaper, wet it down.

Peat moss - spread in a thin layer

The next layers can be in any order

Shredded newspaper

Leaves

Compost (anything from your kitchen that is biodegradable – NO MEAT) or mushroom compost if you have access to a source

Coffee Grounds - if you have a source where you can obtain a large amount

Manure – It is best to use horse manure if you can find it as it usually does not contain antibiotics like chicken or cow manure does unless you know where your manure comes from. Chicken manure is high in nitrogen and is dangerous to plants. It must be composted down before using in the garden.

Last Layer - Bone Meal – lightly sprinkle the top layer with bone meal

Water, Water, Water – will need to water every day if not every other day to get it going. Do not over-water to the point of soaking or drowning.

You can plant seedlings or plants anytime in the garden, but it is best to wait at least 1 year before planting seeds directly as the materials have not broken down to form the soil yet and the seeds will not germinate. Then once a year add mulch to your garden to give it a yearly feeding boost. The finer the mulch the better and DO NOT USE COLORED MULCH. Happy Gardening.

Information compiled by Sheri Bethard, Orange County Master Gardener

Bibliography

"6Vegetables That Taste Best in Cool Temps." <http://gardenclub.homedepot.com>. The Home Depot, 5 Oct 2016. Web. 5 Oct 2016.

Mierzejewski, Kathee. "Growing Beets - How To Grow Beets In The Garden." Gardening Know How. www.gardeningknowhow.com 28 February 2016. Web. 28 February 2016.

Mierzejewski, Kathee. "How To Grow Carrots – Growing Carrots In The Garden." www.gardeningknowhow.com. Gardening Know How. 19 March 2016. Web. 19 March 2016.

Mierzejewski, Kathee. "How To Grow Spinach In The Home Garden." www.gardeningknowhow.com. Gardening Know How. 20 April 2016. Web. 20 April 2016.

Griep, Stan V. "Growing Radishes - How To Grow Spinach." www.gardeningknowhow.com. Gardening Know How. 18 April 2016. Web. 18 April 2016.

Mierzejewski, Kathee. "Growing Cauliflower - How To Grow Spinach." www.gardeningknowhow.com. Gardening Know How. 19 March 2016. Web. 19 March 2016.

"How to Grow Broccoli." <http://usagardener.com>. USA Gardener

"Lasagna Gardening" Sandra Hoke, Orange County Master Gardener

Master Gardener

Congratulations to the newest Master Gardeners!



Joni Cotham

Vicki Gallagher

Sharon Grissom

Paula Landry

Kay Newberry

Patricia Roush

James Smith

Jess Stanley

Gayla Thompson

Billie Trahan

Catherine Powers



Lawn & Garden

Tips for Aphid Control

Aphids: Common problem we will see in our area!

Apply 2.5 Table spoons of Dawn Dish soap per 1 gallon of water spray every other day for 1 month to plants or trees, as well as the ground beneath, reapply if rain occurs, then twice a week for a month, then once a week. This should break the life cycle, and help prevent recurring infestations.

Yellow plastic cups, turned upside down and stuck onto 16 inch tall, broomstick-sized sticks, using a thumbtack. The sticks are pushed into the ground about a foot from the tomato plant. I coat the yellow plastic cup on the outside, with [Tree Tanglefoot](#), a very sticky substance that doesn't wash off. The aphids are attracted to the color yellow, they fly onto the cups and the Tanglefoot catches them. (Don't substitute something else, Tree Tanglefoot is the only thing that doesn't wash off and keeps catching plants.



Jimlongscolumns.blogspot.com

Tropical Sod Webworms

By Robert Richter

This year we have received many calls concerning tropical sod webworms, a common late summer to fall pest of turfgrass here in the Houston area. Callers say that numerous moths are flying out of the turfgrass when they walk across their lawns. There are numerous species of small moths in the landscape so this characteristic alone is not an identifying factor for diagnosing a sod webworm infestation.

There are several species of sod webworms in Texas but it is the tropical sod webworm that is the most damaging to our lawns. The adults are tan to brownish moths about $\frac{3}{4}$ " in size. They hold their wings out alongside their body when at rest, giving them a triangular shape.

The adult moths do not feed on turfgrass but rather lay clusters of eggs on grass blades stems and thatch from which tiny caterpillars hatch in about a week. The larvae feed on the turfgrass blades primarily feeding at night. They then hide in the thatch during the daytime. The larvae eventually pupate and emerge as adults to repeat the life cycle. Several generations of tropical sod webworms can occur during the year but it is generally the late summer to fall generations that are the most numerous and damaging to our lawns.



Areas of injury are usually spotty at first but can quickly grow in size as caterpillars migrate outward in search of food. In addition to identifying the adult moths the larvae can be forced to come up out of the thatch by sprinkling soapy water on the turf, causing them to crawl up on grass blades. Larvae are usually light green from having consumed grass blades, with numerous dark, raised spots along the length of their body.

The turfgrass usually recovers in time but if already in a weakened state may die in some areas. Recovery of St. Augustine is especially slow especially when damage occurs in the fall. If three to four sod webworm larvae are found within a 6-inch-square section of dying sod, then chemical treatment is recommended. There are several products including synthetic pyrethroids and the organic product Spinosad that are effective in controlling tropical sod webworms. However, finding an over-the-counter product labeled for sod webworm control in turf can be challenging. It is important to spray early in an infestation before much damage has occurred.

For more information on tropical sod webworms see the following web sites:

<http://landscapeipm.tamu.edu/ipm-for-turfgrass/pests-turfgrass/sod-webworms/>

<http://harris.agrilife.org/files/2011/05/sodwebworm.pdf>

Lawn & Garden

Garden problem guide

Symptom	Possible causes	Possible cures
Dying young plants	Fertilizer burn	Mix the fertilizer thoroughly with the soil; don't apply too much fertilizer.
	Disease (damping off)	Use treated seed, or drench transplants with a fungicide.
Stunted plants, pale to yellow leaves	Low soil fertility	Test the soil for nutrients needed.
	Poor soil drainage	Add organic matter or plant in raised beds.
	Shallow or compacted soil	Work the soil deeper.
	Insects or diseases	Identify the cause and use appropriate control measures.
Stunted plants, purplish color	Nematodes	Plant Elbon rye in the fall; solarize the soil; plant marigolds in summer.
	Low temperature	Plant at the recommended time.
Holes in leaves	Lack of phosphorus	Add phosphorus fertilizer.
	Insects	Identify the insect and use appropriate control measures.
Spots, molds, darkened areas on leaves and stems	Disease	Identify the cause; spray or dust at the recommended rate and time.
	Chemical burn	Use recommended chemicals at the recommended rate and time.
	Fertilizer burn	Keep fertilizer off plants.
Wilting plants	Dry soil	Irrigate if possible.
	Excess soil moisture	Avoid overwatering.
	Disease	Use resistant varieties if possible.
Weak, spindly plants	Too much shade	Move the garden to a sunny area.
	Plants too crowded	Seed at the recommended rate; thin the plants.
Failure to set fruit	Improper temperatures	Plant at the recommended time.
	Too much nitrogen	Avoid excessive fertilization.
	Insects	Identify the insect and use appropriate control measures.
Tomato leaf curl	Heavy pruning in hot weather	Do not prune; use cages.
	Varietal problem	Use a different variety.
Dry brown to black rot on blossom end of tomato	Low soil calcium	Add gypsum.
	Extremely dry soil	Irrigate and mulch.
	Too much water	Plant on raised beds or reduce irrigation.
Misshapen tomatoes (catfacing)	Cool weather during blooming	Plant at the recommended time.
	Stink bug damage	Apply insecticides.
Abnormal leaves and growth	2,4-D weed killer	Do not use a sprayer that previously contained 2,4-D; do not allow the spray to drift to the garden.
	Virus disease	Remove the infected plants to prevent spreading; control the insects that transmit the virus.



Bee Keeping in Orange County

Fellow Beekeepers

Beekeepers are in PERIL. I hope I got your attention. With 80% of the honey consumed in the United States being imported and being sold at prices that make it difficult for beekeepers to make a profit. To make things worse there is no legal definition of LOCAL so bottlers can say local and the honey can be anything but local. Most of the imported honey is filtered so severely that the pollen is removed and without pollen the honey cannot be tracked to its origin. Honey bottlers will blend large quantities of imported honey with a small amount of "local" honey to tint the honey with pollen.

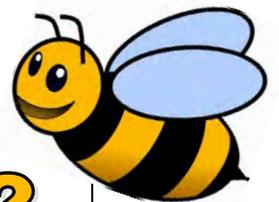
If you're a 1 or 2 hive keeper the issue isn't that big for you, or is it. The fact that U.S. beekeepers are unable to make money selling honey forces more and more of them to transport bees for pollination services. If keepers move bees all over the U.S. does this expose local bees to more diseases? Does this facilitate the transmission of problems faster than Inspection Services can control and inform the public. Remember most commercial beekeepers really don't have a choice to survive in this business climate they must rent and move their hives for pollination.

Think about it, if you see a Honey Label advertising local or Southeast Texas Honey and they are selling on a large scale you need to be suspicious. How many beekeepers in SETX do you know with 1000's of hives? Check the business info on the company, If they are doing a few million dollars of business they are moving a 1,000,000 lbs of honey. That takes a lot of hives.

The ONLY way to know you are buying LOCAL is to KNOW the beekeeper. BUY TEXAS. BUY REAL TEXAS HONEY.

An Orange County Beekeeper

**Have bees?
Need them removed?
Have Questions?
Don't hesitate to call
409-882-7010.**



September 12, 2016

AgriLife Extension offers tips for avoiding Zika

Writer: Steve Byrns, 325-653-4576, s-byrns@tamu.edu

Contact: Dr. Sonja Swiger, 254-968-4144, slswiger@ag.tamu.edu

Dr. Mike Merchant, 972-952-9204, m-merchant@tamu.edu

STEPHENVILLE – The mosquito-transmitted Zika virus is a potential threat to the health of unborn babies in Texas and other states, and the Texas A&M AgriLife Extension Service has stepped up efforts to educate the public on ways to protect themselves from this new menace, said agency entomologists.

“While people enjoy outdoor activities and travel this fall, it’s important to remember that our first line of defense against Zika is to avoid being bitten by mosquitoes,” said Dr. Sonja Swiger, AgriLife Extension entomologist at Stephenville. “The *Aedes aegypti* and *A. albopictus* mosquitoes that transmit Zika occur commonly in our backyards where their eggs are laid and larvae live in standing water. Like other mosquito species, they are active at sunrise and sunset, but commonly bite throughout the day as well.”

Swiger said it’s important to remember the “Four Ds” as a first line of defense. They are:

- Drain: Empty standing water, thus eliminating mosquito breeding sites.
- Dress: Put on long sleeved shirts and pants when going outside.
- Defend: Apply mosquito repellent when going outside.
- Dusk and Dawn: Avoid outdoor activity during these two most mosquito-active periods.

Swiger said simple steps such as repairing screens on doors and windows are critically important to keeping mosquitoes out. Managing landscape water features is another key area in the fight against the spread of the Zika virus.

“Mosquito dunks, commonly sold in garden centers for mosquito control in home water features, can be used to treat water that cannot be readily drained,” she said. “The dunks contain insect growth regulators or mosquito-specific bacteria to effectively control mosquito larvae. Neither approach is harmful to fish or other aquatic organisms.”

Dr. Mike Merchant, AgriLife Extension urban entomologist at Dallas, said that fighting Zika will be much different than fighting West Nile virus. *Aedes* mosquitoes infected with Zika are not easily detected, so health officials have to rely on actual human cases to identify hot spots.

“In addition, city and county truck-mounted sprayers are less effective at killing *Aedes* mosquitoes, so stopping these mosquitoes in each and every backyard is even more important. Everyone will need to pitch in,” he said.

“Anything that holds water should be dumped or treated. Breeding areas can include sites as benign as containers under potted plants and bird baths. Other trouble areas are old tires, empty cans and bottles, kiddie pools, buckets, boat tarps and even clogged gutters.

“It doesn’t take much water for them to reproduce,” he said. “Small containers can hold enough water to breed mosquitoes. *Aedes* mosquitoes don’t travel far from their larval habitat, so if you’ve got them, chances are you unknowingly raised them.”

Swiger said there are many mosquito repellents available, but all approved formulations share two commonalities. The U.S. Environmental Protection Agency registration of these repellent products means first, that the active ingredient has been tested and is safe for people to use, and second, that it's effective in repelling mosquitoes when used as directed.

"EPA and the Centers for Disease Control have evaluated scientific reports and conclude mosquito repellents containing DEET, picaridin, oil of lemon eucalyptus, called IR3535, as active ingredients provide reasonably long-lasting protection from mosquito bites," Swiger said.

"Users should always read and follow label instructions. Most repellents can be used on children over two months of age, with the exception of those containing oil of lemon eucalyptus, which should not be used on children younger than 3 years old. For babies under two months of age, infant carriers fitted with mosquito netting are recommended. Pregnant and breast-feeding mothers can safely use EPA-approved insect repellents."

Swiger said constant vigilance is the key to slowing Zika and other mosquito-borne diseases such as West Nile virus.

"It's the global world we live in today," she said. "As people travel and return from areas affected by Zika, some will return carrying the virus. When Aedes mosquitoes bite infected people, they acquire the virus. The mosquito then transmits it to an uninfected person, passing the virus to them."

Swiger said that as of this writing, there are 179 recorded cases of Zika in Texas, all travel associated, except for two contracted sexually from a partner who traveled. Eleven pregnant women have been infected. Texas has two infants that were infected before birth and one infected infant that was stillborn. So far no Texas mosquitoes have been found to be infected. Harris and Dallas Counties lead the state in numbers of cases with 52 and 35 respectively. Tarrant county is next with 21 cases.

"Epidemics are expected as infected people arrive and locally acquired infections occur," she said. "As the many media accounts report, women infected by the virus while pregnant are known to have babies with severe neurological defects. Aside from mosquito infections, additional cases may occur from sexual transmission of the disease. So, avoiding mosquito bites to protect yourself from infection is the most important thing you can do to defend against this new mosquito-borne virus threat."

For more information, contact Swiger at 254-968-4144 or slswiger@ag.tamu.edu or Merchant at 972-952-9204, m-merchant@tamu.edu. More information is also available at the following websites:

Texasinsects.org

Livestockvetento.tamu.edu

Preventingzika.org



What Texans Need To Know About ZIKA VIRUS

Sonja L. Swiger, Assistant Professor and Extension Livestock/Veterinary Entomologist
 Michael Merchant, Professor and Extension Urban Entomologist

WHAT IS ZIKA?

Zika is a mosquito-transmitted disease caused by the Zika virus. This virus is not new, but from 2007 to 2014 the virus spread into new countries and perhaps became more dangerous to people. The illness caused by the Zika virus is usually mild compared to other mosquito-carried illnesses like dengue fever, West Nile virus, and chikungunya. Only one in five people infected with Zika will feel ill. These individuals typically develop mild symptoms that include fever, joint pain, red itchy eyes (conjunctivitis) and rash. Symptoms typically occur 2 to 7 days after being bitten by an infected mosquito. Symptoms in some individuals may be more severe. The association between Zika and Guillain-Barre syndrome (a type of paralysis) is under investigation.

Until recently, Zika was considered a mild disease with few lasting effects. However, public health officials are now concerned that pregnant women who contract Zika can pass the virus on to their unborn babies, which may result in a birth defect known as microcephaly. Microcephaly is a condition where the fetal brain and head do not fully develop and reach normal size. Currently, there is no vaccine or preventive treatment for Zika, nor is there a cure for microcephaly. For more information about the effects of Zika on humans, see <https://vitalrecord.tamhsc.edu/zika360/>.

HOW DO I GET ZIKA?

A person gets Zika from the bite of an infected mosquito. In turn, mosquitoes get the virus when they bite a person who is infected with the Zika virus. The best carrier (vector) of the Zika virus is the yellow fever mosquito, *Aedes aegypti*. The Asian tiger mosquito,

Aedes albopictus, can also carry the Zika virus. The degree to which *Aedes albopictus* may be contributing to Zika transmission in the Americas is unknown. Both these mosquitoes are common in Texas, and may be found in the same communities.

Since 2002, the most important mosquito-transmitted disease in Texas has been West Nile virus. West Nile virus is carried by a different mosquito, the southern house mosquito, *Culex quinquefasciatus*.



Aedes albopictus feeding

Unlike the *Culex* mosquitoes which fly only at night, *Aedes* mosquitoes are active throughout the day and into the evening. For this reason, it is critical to protect against mosquito bites both day and night.

Under certain circumstances, Zika can also be transmitted sexually from men to women. To date, this is the only way local transmission of Zika is known to have occurred in the United States. In countries where mosquitoes spread Zika, sexual transmission of the virus is relatively less common. For this reason, the US Centers for Disease Control recently recommended that women with confirmed cases of Zika, or who have experienced symptoms of the virus, wait at least eight weeks after the start of their symptoms before trying to get pregnant. Additionally, men with confirmed cases of Zika, or who have had symptoms of the virus, are now advised to wait at least six months after their symptoms begin before having unprotected sex. These recommendations are based on current knowledge of how long the Zika virus remains active in the body and in semen.

Any container capable of holding water for 8 to 10 days can produce dozens or hundreds of mosquitoes a day.



SHOULD I BE WORRIED ABOUT ZIKA?

As of March 2016, the Zika virus has not been locally transmitted by mosquitoes to humans in Texas. Currently, the risk of Zika infection in Texas appears negligible. During the winter and early spring, the principal risk is for travelers to areas where Zika is active. However, local transmission of Zika might be possible during the active mosquito season (average daily temperatures above 75 degrees F) and more people return to the State while infected. This risk is expected to remain low for most of Texas. Your local health department, the Texas Department of State Health Services, and the local media are good sources for changes in the risk of Zika in your area. The most current information on Zika in Texas is at: <http://texaszika.org/>.

STOPPING ZIKA

There are two steps you can take to reduce your risk of getting Zika or West Nile virus from a mosquito. First, you can make your home environment less likely to breed mosquitoes. Second, you can reduce your risk of a mosquito bite by dressing appropriately and wearing mosquito repellent when you are outdoors.

All mosquitoes require bacteria-laden water in which to breed. *Aedes aegypti* and *Aedes albopictus* mosquitoes breed in small water- and debris-filled containers like bottles and cans, buckets and wheel barrows, tarps, gutters, birdbaths, flower pot dishes, and tires. Any container that can hold water for 8 to 10 days can produce dozens to hundreds of mosquitoes a day. Clean rainwater or irrigation water that fills a container with organic material (leaf debris, grass clippings, etc.) takes about four days to produce enough bacteria to sustain mosquito breeding. Because the mosquitoes that carry Zika fly less than 200 meters from their larval breeding site, most of the biting mosquitoes in your backyard come from containers in your or your close neighbor's

yard. Again, the first step to stopping Zika is to fill or eliminate any water containers around your home. For more information about mosquitoes and how to check your yard for mosquito breeding sites, visit: <http://mosquitosafari.tamu.edu>.

Mosquitoes can bite any time you are outdoors—even for short trips to water the garden or pull weeds. Anyone staying outdoors for extended periods in mosquito-infested areas should wear long sleeves, long pants and light-colored, loose fitting clothing to prevent mosquitoes from biting. Skin applied repellents can also provide good protection for 2 to 12 hours. DEET, picaridin, and IR-3535 are some of the better repellents for exposed skin; however, for shorter exposure times many other effective products are available. For more information about choosing a repellent, see the U.S. Environmental Protection Agency's repellent calculator: <http://www.epa.gov/insect-repellents/find-insect-repellent-right-you>

PRECAUTIONS FOR TRAVELERS

Texas' proximity to Mexico and other Latin American countries where Zika is common, make it one of the highest risk areas for Zika in the United States. Anyone traveling to and from areas where the Zika virus is present should take special precautions to avoid getting the virus or spreading it to others. This includes avoiding mosquito infested areas, wearing long sleeved shirts and long pants when in mosquito prone areas, and using a good repellent.

In addition to being careful to avoid Zika when traveling, it's important to avoid passing on the Zika virus when you return home. Even travelers who feel well can pass on the Zika virus. Eighty percent of those who get Zika will not know they have been infected. To minimize this risk, returning travelers should wear repellent for at least a week to avoid the possibility of introducing the virus to your community.

For more information and links to resources: <http://preventingzika.org/>

Texas A&M AgriLife Extension Service

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<http://UrbanEntomology.tamu.edu>

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4200 Smith School Road
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TEXAS PARKS AND WILDLIFE

Raspberry Crazy Ant

A new exotic species invading Texas



Bastiaan M. Drees, Paul R. Nester and Roger E. Gold, Texas AgriLife Extension Service

Raspberry Crazy Ants

In 2002, Tom Rasberry, a professional pest-management provider from Pearland, discovered a population of a new pest ant near Pasadena, Texas, in Harris County. Huge numbers of this new ant literally covered the landscape in industrial parks and residences. The Center for Urban and Structural Entomology within the Department of Entomology at Texas A&M University has identified the ant as a new exotic invasive pest in Texas, but the species' identification and country of origin are still unresolved. It is now commonly called the Raspberry crazy ant, *Nylanderia* sp. nr. *pubens* (previously in the genus *Paratrechina*). Currently, little is known regarding the biology or control of this ant. The ant population has begun to spread, often through human assistance.

Where are they found?

As of 2009, high numbers of the Raspberry crazy ants have been found in the southern part of Texas. As of November 2009, infestations have been confirmed in Bexar, Brazoria, Chambers, Fort Bend, Galveston, Hardin, Jefferson, Jim Hogg, Liberty, Montgomery, Orange, Walker and Wharton counties. New infestations are suspected beyond these areas. The most current distribution is posted at <http://UrbanEntomology.tamu.edu>. These ants can be transported through movement of almost any infested container or material. Thus, the movement of potted plants, mulch, garbage, yard debris, bags or loads of compost or bales of hay by car, truck, railroad or airplane can transport ant colonies and result in new areas of infestation.



What is their pest status?

Recently, the ant was also found in beehives causing the bees to abscond the hives, and for this reason, the Texas Department of Agriculture (TDA) considers the Raspberry crazy ant to be an agricultural pest. However, no information is yet available on any potential damage to crops or adverse economic effects in infested lands. Crazy ants can hitchhike on nursery plants and other landscaping materials. Furthermore, state law requires nursery products and premises to be free of pests and diseases. Therefore, TDA may require a

treatment or other appropriate regulatory measures upon detection of crazy ants on nursery products and/or in premises. Nursery managers and retail garden store managers are encouraged to keep their premises free of crazy ants.

What do they do?

In infested areas around the Houston area, large numbers of Raspberry crazy ants have caused great annoyance to residents and businesses. Because one multi-queen colony can number in the millions, ants can blanket the ground and trees, creating uncomfortable situations that prevent residents from enjoying time outdoors. Pets and livestock may avoid the area due to the constantly crawling crazy ants.

Raspberry crazy ants have been found accumulating by the thousands in electrical equipment, causing short circuits and equipment failure. In some documented cases, the ants have caused tens of thousands of dollars in damage and remedial costs. Critical electrical and computer systems in traffic signals, businesses, schools, hospitals and airports could be affected.

Do they sting or bite?

Although these ants do not have stingers, worker ants possess a structure called an acropore on the end of their abdomen which can excrete chemicals for defense or attack. The Raspberry crazy ants are capable of biting, and their bite causes a relatively sharp pain that quickly fades.



Accumulations in electrical equipment cause short circuits and equipment failure.

What effect do they have on wildlife?

Very little is currently known about the wildlife impact from Raspberry crazy ants. If you observe any effect on wildlife, please report it to Texas Parks and Wildlife Department by submitting the "Wildlife Impact Report" form found at <http://UrbanEntomology.tamu.edu>. Also, please report any situations where the crazy ants are affecting agricultural animals, including invasion and loss of wild and domestic honey bee hives.

Wildlife such as songbirds can be irritated by the Raspberry crazy ants. Masses of crazy ants covering the ground and trees likely affect ground and tree nesting birds and other small animals, and cause wildlife to move out of the area.

The ants are even displacing red imported fire ants in areas of heavy infestation. However, after experiencing the Raspberry crazy ant, most residents prefer the fire ant.

A related species of crazy ant has been a serious pest in South America, reportedly displacing all other ant species. In addition, the South American crazy ant pest caused chickens to die of asphyxia due to ants obstructing their nasal passages. Larger animals, such as cattle, have been attacked around the eyes, nasal area and hooves.



Identifying characteristics and behavior

Proper identification of Raspberry crazy ants by a specialist is essential.

If you are a professional pest management provider or landowner and you suspect you have seen these ants, please SUBMIT A SAMPLE FOR IDENTIFICATION by the Center for Urban and Structural Entomology. Visit <http://UrbanEntomology.tamu.edu> for an "Identification Request Form" and instructions on submitting ants for identification. The process through the center is free, requiring only postage from you.

Until better control methods are developed, you can help control Raspberry crazy ants by identifying colonies and discouraging the ants from nesting on your property.

Raspberry crazy ants:

- Are about 1/8-inch long and reddish-brown in color, not black.
- Are social insects that live in large colonies containing many queen ants, worker ants and brood consisting of larval and pupal stages. Colony size can be in the millions, infesting entire subdivisions, industrial sites, agricultural operations, parks and wildlife habitats.
- Do not construct hills or mounds like fire ants, and do not emerge to the surface from underground nests through central openings. Instead, colonies can be found under or within almost any object or void, including piles of debris, stumps, fallen logs, leaf litter, soil, concrete, rocks or potted plants.
- Primarily form nests outdoors, but can roam indoors from outdoor nests.
- Form loose foraging trails as well as forage randomly (non-trailing) and crawl rapidly and erratically (hence the description "crazy" ant).
- Eat almost any acceptable food item. Worker ants commonly "tend" sucking hemipterous insects such as aphids, scale insects, whiteflies, mealybugs, and others that excrete a sugary liquid called "honeydew." Worker crazy ants are also attracted to nectar-rich parts of plants, damaged and overripe fruit, hummingbird feeders and will consume other insects and small vertebrates for protein.
- Are hard to spot during cooler winter months. In spring, foraging activity begins and colonies grow, producing millions of workers that increase dramatically by mid-summer (July-August). Ant numbers remain high through fall (October-November).

What can you do to prevent and control them?

The best way to prevent a Raspberry crazy ant infestation is to be "ant-aware."

- Report suspicious ant problems, and have the ants identified by a specialist.
- Avoid bringing ant-infested articles onto your property. Carefully inspect new plant materials, mulch or soil brought onto your property.
- If Raspberry crazy ants are detected, practice good sanitation techniques by removing potential nesting sites, such as piles of debris (mulch, wood, etc.) from around buildings, or stacks of debris from the property, taking care not to spread the ants in the process.



Many of the typical control tactics that work for other ants do not provide adequate control of the Raspberry crazy ant. The worker ants are not attracted to most bait products used for fire ants and other ants. Because colonies predominantly nest outdoors, indoor treatments are not effective in controlling ants that venture inside structures.

However, there are treatments available that offer temporary "buffer zones" around homes and other structures in urban areas. These products must be applied by a licensed applicator only and are not readily available to the consumer. There are currently no licensed or effective treatments that can be used around livestock or wildlife habitats.

If you suspect your house or property is infested with Raspberry crazy ants, call a professional pest control provider. These experienced, licensed professionals can offer the most current, successful alternatives that are unavailable to consumers. After treatment, or when making multiple applications over time, piles of dead ants must be swept or moved out of the area in order to treat the surface(s) underneath, being careful not to sweep or blow away a treated surface such as soil.

Control of Raspberry Crazy Ants In and Around Homes and Structures

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The Raspberry crazy ant, *Paratrechina* species near *pubens* (Hymenoptera: Formicidae), is a new exotic invasive pest ant species discovered in the Houston area in 2002 that has spread to isolated spots in 14 Texas counties by 2009. Little is known about the biology of this ant, but where it occurs, millions of worker ants are observed in the landscape and inside structures such as homes. They accumulate in electrical equipment causing them to fail. They are irritating to people and domestic animals and seem to displace other animals in infested areas.

Current information about this ant can be found at <http://urbanentomology.tamu.edu>, including how to identify and send specimens in for official identification. This process is essential because counties with positive identifications are added to the list of locations where one of the more effective insecticide products, Termidor® SC

Termiticide/Insecticide (fipronil), can be applied using an expanded treatment pattern around infested home structures.

Control of Raspberry crazy ants in urban areas is difficult and provides only a relatively short period of suppression using currently available treatment methods. Although many insecticide products labeled for ant control are sold through retail outlets to consumers, they are generally less effective than products available to professional Pest Management Providers (PMPs). Although these over-the-counter products do kill ants, the Raspberry crazy ant occurs in such high numbers and is so pervasive in the landscape that control is very short term. Even without using insecticides, piles of dead ants form around the perimeters of buildings and along baseboards indoors. If contact insecticides had been applied to surfaces the layers of dead ants prevent surviving ants from contacting the treated surface and thereby render the application less effective.

Research conducted to assess the effectiveness of available insecticide products and treatment methods have demonstrated that the most effective approaches are best applied by PMPs certified by the Texas Department of Agriculture in a category applicable to use of this product. This qualifies these individuals to purchase the products only available to them and their knowledge of insect control will ensure proper applications are made according to directions provided on the product labels and special labels for control of

this pest. Both the container label and Quarantine Exemption use directions must be in the possession of the applicator at the time of treatment.

Homeowners or occupants are discouraged from trying to battle this pest on their own using retail insecticide products. Accounts of individuals making applications almost every day and using insecticides not in accordance with directions provided on the labels are common. Thus, the cost of home treatments and the potential for health issues due to misuse or overuse can increase relative to using a PMP service.

If you are seeking assistance from a PMP, discuss treatment options with them. Bids may vary widely and products proposed for use may also vary. For this pest ant, the most effective approach at this time is described below:

Profession Pest Management Program:

Methods of controlling Raspberry Crazy Ants Video: <http://youtu.be/ZUfKbkvwq0k>

A. Outdoors



1. The outside perimeter of the home or structure is treated using **Termidor® SC Termiticide/Insecticide** (9.1% fipronil) using the TDA-issued Quarantine Exemption label (see http://www.agr.state.tx.us/vgn/tda/files/1848/23436_termidorlabel.pdf).

For control of crazy ant species associated with man-made structures in Texas within the counties of Bexar, Brazoria, Chambers, Fort Bend, Galveston, Hardin, Harris, Jefferson, Jim Hogg, Liberty, Montgomery, Orange, Walker, Wharton and to include additional counties where positive identification has been made (by Texas A&M entomologists) and posted on <http://urbanentomology.tamu.edu>. Check the Texas Department of Agriculture website for the most current list of counties approved for this use.

Apply **Termidor** as detailed on the present **Termidor SC** container label for perimeter pest control with the exception of the following:

- a. Treatments may be made as a low-pressure general surface spray (coarse flat fan), crack and crevice spray or wall void application, where ants enter the structure, trail around the structure (e.g., around doors, windows, vents, pipes or any exterior openings including foundation cracks or drilled holes, and where wires enter the structure), or where they crawl and hide around the structure. For exterior perimeter treatments, apply 0.06% Termidor SC finished dilution to surfaces up to but not to exceed **3 ft. up**

and 10 ft. of grass sod out from the foundation. Mounds or nests can be treated directly within 10 ft from the foundation.

- b. Treatment may be made **up to 10 feet around** areas where ants are found associated with utility wires (electrical, telephone, or cable). Foam treatments can be made to outdoor structural voids where ants may enter, trail or nest.
- c. Treatments should be made as a general surface spray (coarse flat fan), crack and crevice spray or wall void application. For exterior perimeter treatments, apply 0.06% **Termidor SC** finished dilution to surfaces up to but not to exceed **3 ft. up and 10 ft. of sod out from the foundation.** Mounds or nests can be treated directly.

Termidor SC at 0.06% is equivalent to 1.2 oz product/1.5 gallons to treat 1000 sq. ft. or 0.0075 lb ai/1000 sq. ft. or 0.0000075 lb ai/sq. ft. or .0012 oz product/sq. ft.

Apply 0.06% **Termidor SC** finished dilution around doors, windows, vents, pipes or any other exterior openings (including foundation cracks and drilled holes) where ants could enter the structure. Treat the joint where exterior siding (wood, vinyl, aluminum, etc) meets the cement, block or brick foundation. Broadcast treatments may be applied 2 times per year per structure. Treatments may be made 2 times per year per structure, at intervals of 180 days. Making the first treatment in the spring when ants are in the building and re-applying in mid to late summer is one example of timing to help prevent later season buildup of ant numbers. **See use restrictions listed on the label.**

2. For the remainder of the turfgrass areas in the landscape, another product, **TopChoice™ Insecticide** (0.0143% fipronil) granules can be broadcast at a rate of 87 lbs per acre or 2 lbs per 1,000 sq ft as instructed for red imported fire ant and nuisance ant control. Treated turf should be watered in after application. Only one application per year is allowed. Do not apply within 15 ft. of fresh water or 60 ft of estuarine bodies of water.

B. Indoors



1. Many of the typical control tactics for other ants do not provide adequate control of the Raspberry crazy ant. Because colonies predominantly nest outdoors, reliance solely on indoor treatments (see B-6183, “Managing Household Pest Ants” and <https://agrillifebookstore.org/>) to control these ants foraging inside structures is not effective.

If ants are entering structures, a third product, **Phantom® Termiticide-Insecticide** (21.45% chlorfenapyr) can be applied as a spot or crack and crevice spray for residual pest control in houses, apartments, or other residential structures and additional sites listed on the product label. For control of ants, use a dilution rate of 0.50% (3.0 fl oz or 88 ml per 1 gal water as directed. See precautions listed on product label.

C. Other alternatives

Raspberry crazy ant workers are not attracted to most ant bait products (see B-6099, “Broadcast Baits for Fire Ant Control” at <https://agriflifebookstore.org/>), but there is one product they are known to be attracted to: Prescription Treatment® Brand Advance® Granular Carpenter Ant Bait formulation containing abamectin (see the product label at: http://www.wmmg.com/pdf/label/AdvCarp_v73_Spec_WEB.pdf). Also see E-412 “Carpenter Ants” at <https://agriflifebookstore.org>.

There are other products available for “ant control” contain directions to establish temporary "buffer zones" using contact insecticides applied to surfaces, such as those containing acephate, pyrethroid insecticides (bifenthrin, cypermethrin, cyfluthrin, deltamethrin, lambda-cyhalothin, permethrin, s-fenvalerate, and others). These treatments are often breeched soon after application, depending on population density and time of year and product applied.

What can the homeowner or occupants do to help?

People living or working in buildings and landscapes infested with Raspberry crazy ants should work closely with their contracted PMP to assure that treatments applied can reach their maximum potential. Steps that will help include:

1. Remove any trash or unnecessary landscape elements, trash or debris from the landscape under or in which these ants will nest. Be careful not to discard infested materials in non-infested locations as this will help spread the ant infestation.
2. Outside the structures, remove obstacles that would prevent a thorough uniform spray application of the contact insecticide to the perimeter (3 ft up and 10 ft out from the base of the structure).
3. Inside, move furniture and other obstacles away from walls to enable the PPMP to make a uniform crack and crevice treatment along the baseboard. Vacuum the area to remove dust and dirt so that the contact insecticide is actually applied to the surface.
4. After application and dead ants accumulate, carefully remove them with a leaf blower outdoors or vacuum indoors in a manner that does not disturb or remove the insecticide

from the treated surfaces. For example, do not vigorously wipe or scrape clean treated surfaces.

Acknowledgments

The authors are grateful from review comments from Tom Rasberry and David Oi. Image of Rasberry crazy ant worker by Mike Quinn.

Policy Statement for Making Chemical Control Suggestions

Suggested pesticides must be registered and labeled for use by the Environmental Protection Agency and the appropriate state Department of Agriculture or regulatory agency. The status of pesticide label clearances is subject to change and may have changed since this publication was printed. County Extension agents and appropriate specialists are advised of changes as they occur.

The USER is always responsible for the effects of pesticide residues, as well as for problems that could arise from drift or movement of the pesticides from his property to that of others. Always read and follow carefully the instructions on the product label.

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the participating states' Cooperative Extension Service, Agricultural Experiment Station, U. S. Department of Agriculture, Agricultural Research Service, or Animal and Plant Health Inspection Service is implied.

All pesticides are potentially hazardous to human health and the environment. As a pesticide user, you are legally required to read and carefully follow all directions and all safety precautions on the container label. Label instructions are subject to change, so read the label carefully before buying, using and disposing of any pesticide. Regardless of the information provided in an Extension publication, always follow your product's label. When in doubt about any instructions, contact your pesticide seller, or the manufacturer listed on the label, for clarification. All pesticides should be stored in their original labeled containers and kept out of the reach of children. Never pour leftover pesticides down a storm drain or any other drain.

Upcoming Events:

- 10/25/16: Southeast Texas Beef Cattle Symposium & Trade Show, Winnie/Stowell Community Building, Winnie, TX**
- 10/26/16, 11/2/16, 11/9/16, 11/16/16: Do Well Be Well with Diabetes, 2 pm—4 pm. Bridge City**
- 11/2/16: Pesticide Training & CEU Update: 11:00 AM—3:00 PM, Lunch Provided, Extension Office.**
- 11/6/16: Food Handlers class, 6:00 pm, Extension Office.**
- 12/1/16: Recertification Training for Commercial, Non-Commercial, Private Pesticide Applicators and SPCB; Ford Park Exhibit Hall**
- 12/15/16: Town & County 7 Hour CEU Conference, Extension Office.**