WVU UPDATE
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Get ready! Cicadas are coming after 17-year hiatus

By John F. Baniecki
Plant Pathology and Entomology Specialist, WVU Extension Service

Much of West Virginia will receive a regular but none too welcome visitor this spring. Brood V of the periodical cicada, the so-called 17-year locust, will appear in large numbers in 40 counties in 1999.

The onslaught of this well known insect is always memorable because of its tremendous numbers, its incessant high-pitched sounds, and the loss of countless numbers of twigs and small branches. During its short aerial existence, it leaves very decisive signs of its presence in slits, which thickly fill the smaller twigs and branches of trees.

Growers worry that crops will be destroyed. However, the cicada does not feed on foliage of any kind. If the adult feeds at all, it does so by inserting its beak into bark and sucking juices. Besides making a lot of noise, about the only thing cicadas do in most places is prune the tips of branches and shrubs. It is their cousins—the likes of aphids, scale insects, and green-bugs—that cause broad crop damage regionally and nationally.

The periodical cicada is a stout-bodied, black insect 1-1/2 to 2 inches long. Its body has orange or orange-brown stripes, and the wings are membranous. The eyes and legs are red. It closely resembles the common "jar fly" or "dog-day fly" seen every year, except it is somewhat smaller and darker.

Myths abound

Long before Europeans came to North America, the American Indians observed the periodical cicada. Its appearance at 17-year intervals aroused their superstition and fear. The dark bars on their filmy wings resemble a "W," suggesting war to the superstitious.

The Pilgrims dubbed the cicada a "locust" on its first appearance to them at Plymouth, Mass., in 1634. It undoubtedly reminded the colonists of the migratory locust, a species of grasshopper that ruined crops in Egypt in Biblical times and still is a threat to crops in many parts of the world. To this day, some people still erroneously refer to cicadas as locusts.

Many stories are told of the sting of the cicada. All are false. The insect has no stinger. Young children might mistake the vibrations of the wings or the sharpness of the feet as a sting, but the cicada is not considered harmful. Some also claim that fruit is poisoned if stung by a cicada. This also is a myth.

Beyond the folklore, however, the cicada is one of the most intriguing of all insects on the American continent simply because of the curious features of its life history. The most remarkable of these peculiarities is its long period of underground existence, ranging from 13 to 17 years. In West Virginia, broods are all of the 17-year strain, and their last appearance was in 1982. So, get ready—they're due this year!

As if by signal, millions of cicadas will emerge from the earth in mid May.

Bracing for the onslaught

After 17 years of living in underground tunnels, millions of cicadas will emerge from the earth in late May, as if by a predetermined signal. They'll undergo a startling transformation and fly to nearby trees and shrubs. From morning to night, they will fill the air with their monotonous droning songs. In a few weeks, after mating and laying their eggs, they will die, leaving behind a multitude of injured twigs on the trees they have visited.

The eggs hatch in about six weeks, and the young cicadas drop to the ground, burrow into the soil, and attach to a suitable root. Here they remain, sucking sap from the roots of trees and shrubs for the next 17 years, until it is time for them to emerge. Because the young cicadas feed slowly, most trees survive.

For many people, it is the incessant singing of the adult periodical cicadas that makes their time above ground so annoying. The males produce five different sounds, but the call most commonly noted is best described as sounding like "farro." A second common call is a whirring sound. The female never breaks out in song, for she is voiceless. The adult cicada moves sluggishly, seldom takes food, and only occasionally resorts to flight.

Tree protection tactics

Damage associated with the cicada is caused not by feeding but by the egg-laying slits or punctures of the female. Twigs in which many egg slits have been made are often broken or partially broken from the branches. On young fruit trees, this injury, if extensive, can set back normal growth. Wounds allow diseases to enter and provide shelter and feeding locations for other insects, such as scales and wooly apple aphid.

More than 250 species of trees and shrubs are subject to attack by the egg-laying female. However, she seems to show a preference for oak, maple, apple, dogwood, and nut trees. Mature forest trees can usually withstand this temporary harm because the cicada finds many twigs in forests in which to deposit eggs. Most at risk for damage is the lone fruit tree or seedlings less than a foot tall.

To protect vulnerable trees, prune very lightly or not at all during the next few months. The female and her egg laying habits will damage twigs, weakening them so that many will break and fall from the tree. Wait till late June or so to prune, when you can cut out, as far as is practical, the remaining badly damaged twigs and branches. With fertilization, you can stimulate these trees to a rapid, vigorous growth, so that the wounded places remaining may heal more rapidly. Delayed pruning is especially important for fruit trees less than three years old.

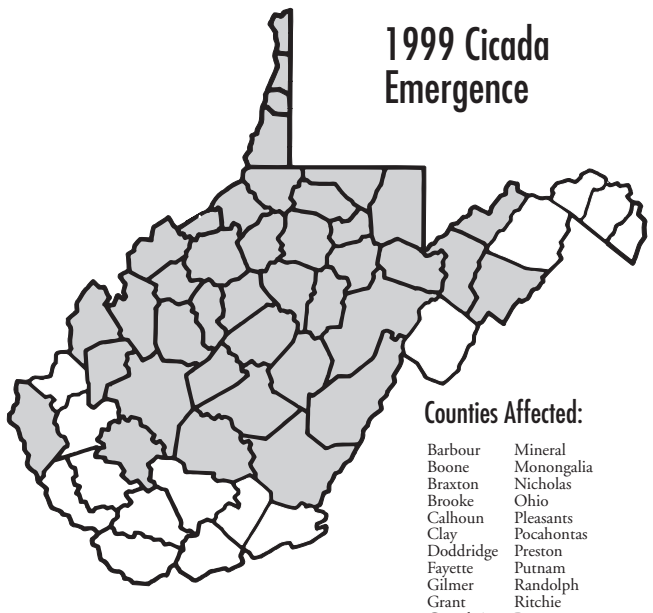
Commercial fruit growers and nursery operators should make plans now to protect their plants. Cicadas could disfigure young orchard or nursery trees and make them less marketable. Most damage will be at the branch tips and will not affect fruit production.

By not planting small trees, shrubs, and ornamentals this spring, you can avoid damage caused by the female periodical cicada. You can protect existing plantings by covering them with open weave cloth, such as cheesecloth, mosquito netting, or tobacco shade cloth. Put the cloth in place as soon as the adult cicadas begin to appear, and keep the tree or shrub covered until most of them have died. Leave the cloth loose enough to allow for plant growth and sunlight. Be sure to tie the bottom closed or the cicadas will crawl up inside and lay eggs.

While some insecticides have made some control possible, they cannot completely protect the trees from damage. If you choose this method, follow the instructions and precautions on the label. Do not apply insecticides when there is a danger of drift or when honey bees or other pollinating insects are visiting plants.

The insecticide Sevin may be sprayed on the trees at about the time the cicada begins laying eggs. Apply the spray thoroughly to the trunk, scaffold limbs, and branches as damage prevention depends upon thorough coverage. For best results, it must be reapplied about every three to five days for four to six weeks. Spraying can stop when the singing stops.

And just when you think the singing will never stop, it does. As the droning finally ceases, West Virginians can take comfort in the certainty that the periodical cicada will not emerge again until 2016. ●



University raises roof on grouse house

By David Welsh
WVU College of Agriculture, Forestry and Consumer Sciences

The West Virginia University Animal Sciences Farm will welcome some new residents upon the completion of a "grouse house," a pet project of adjunct faculty member Robert L. Cochrane.

Cochrane is working with faculty in the Division of Animal and Veterinary Sciences of WVU's College of Agriculture, Forestry and Consumer Sciences. He has taken on a formidable challenge—raising ruffed grouse in captivity by artificially inseminating them and hatching the eggs in an incubator. He has collaborated with the West Virginia Division of Natural Resources and scientists in neighboring states by supplying them with day-old to week-old chicks and adult birds. In addition, he feeds and cares for the birds with the assistance of volunteers.

As Cochrane's efforts grew more skilled and yielded more success in rearing grouse, he decided to help WVU develop research facilities to study the grouse. Using funds he had donated for construction and upgrade of animal housing facilities, Cochrane and animal science faculty and staff broke ground and began construction of the grouse house in early October. When completed, the facility will help WVU begin a new chapter in avian research.

Little is known about the ruffed grouse, reproductively speaking, according to Lisa Williams, a graduate research assistant in the Division of Animal and Veterinary Sciences.

"It is known that their breeding season is in the spring," Williams said. "During that time, the male grouse will drum, a sound made by cupping his wings and rapidly beating them against the air. The male grouse uses this mating behavior to attract females and to warn off other males."

However, the male will also drum in the fall, Williams noted. This may be an indication that the males' sperm production is not seasonal.

"To determine if this is true, semen will be collected from male grouse throughout the year and checked for presence of live sperm," she said. "Semen also will be collected from male grouse during the breeding season to determine volume, sperm concentration, motility of sperm, and percentage of normal cells."

The female grouse usually will lay between 7 to 12 eggs and incubate the eggs for 23 to 24 days, Williams explained.

"Because the grouse at WVU are being raised in captivity, the eggs are collected and then placed in an incubator," she added. "The size of these eggs influences overall hatchability and chick size; therefore, it is important to know what factors affect egg size. Eggs in domestic fowl and quail have been found to increase in weight as the egg laying season progresses, but will reach a maximum weight that remains constant until egg laying ceases. Hens of those species in their second year of lay will have slightly heavier eggs than third-year hens and significantly heavier eggs than fourth-year hens and older. Hatchability and overall egg production also decline with increasing age of the chicken or quail hen. Data on grouse hens and their eggs will be collected to determine if these factors hold true in the grouse also."

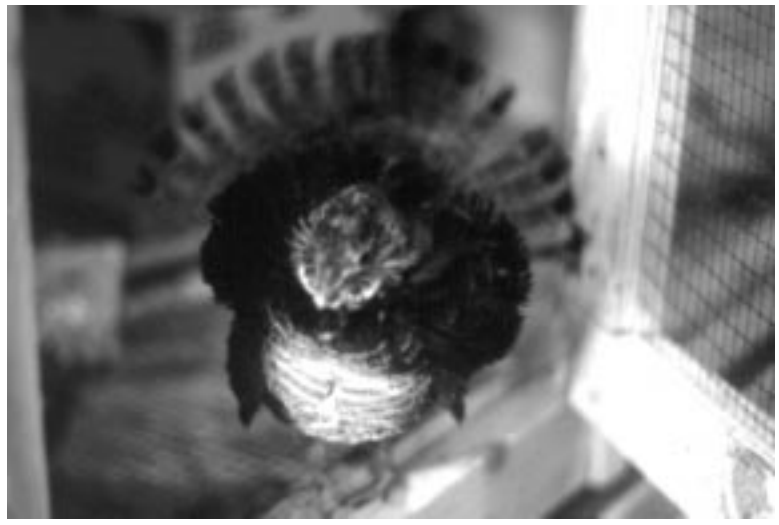
Animal and veterinary sciences faculty member Hillar Klandorf has already seen positive outcomes of the grouse project.

"The ruffed grouse is the state bird of Pennsylvania, and the national Ruffed Grouse Society is headquartered in Coraopolis, Pa.," Klandorf said. "Yet until recently, the National Aviary in Pittsburgh did not have a ruffed grouse in its extensive collection of bird species." When Director Jim Bonner shared this problem with Klandorf and Cochrane, they donated a breeding pair to the aviary.

Cochrane's work with the Division of Animal and Veterinary Sciences is a second career. He has worked as a research scientist with the U.S. Food and Drug Administration, but spent the bulk of his career with Eli Lilly and Co. and G.D. Searle and Co. Throughout his career, he maintained close ties with WVU, donating funds through the WVU Foundation in support of animal research programs.

A native of Morgantown, Cochrane graduated from WVU in 1953 with a degree in zoology. He later went on to earn a Ph.D. in genetics from the University of Wisconsin, emerging as a leader in the field of research on reproduction in rodents. After his retirement, he returned to Morgantown to assist his parents and began to volunteer his time to the Division.

Faculty in the program recognized his contributions and expertise and named him an adjunct faculty member in 1987. Since that time he has been a contributing member of the animal sciences faculty. ●



Focusing on the ruffed grouse, WVU researchers and students are increasing knowledge of avian reproductive systems.

Coming Up....

Feb. 9	**Potential for Seasonal Dairying in West Virginia,** Jackson's Mill 4-H Conference Center, Weston. Contact: Edward B. Rayburn, (304) 293-6131, Ext. 4209.
Feb. 9	**West Virginia Forestry Association Woodland Owners Workshop,** Pendleton County. Contact: David Seymour, (304) 258-2286.
Feb. 10	**"The Beef Cattle Industry: What Does the Future Hold?"Conference,** Best Western Lee-Jackson Motor Inn, Winchester, Va. Contact: Craig Yohn, (304) 725-3744.
Feb. 13	**Federal Taxes on the Sale of Timber and Estate Planning for Private Land owners,** W.Va. Wood Technology Center, Elkins. Contact: Tim Pahl, (304) 293-7750.
Feb. 17	**1999 Educational Focus Meeting: Livestock Marketing,** WVU Extension Service, 6 p.m., W.Va. State Fairgrounds. Contact: John McCutcheon, (304) 647-7408.
Feb. 18	**1999 Educational Focus Meeting: Livestock Marketing,** WVU Extension Service, 6:30 p.m., Cedar Lakes Conference Center, Ripley. Contact: Ed Smolder, (304) 372-8199.
March 3-4	**Pennsylvania Grazing and Forage Conference,** Holiday Inn, Grantsville, Pa. Contact: Edward B. Rayburn, (304) 293-6131, Ext. 4209.
March 6-8	**West Virginia Trappers Association Fur and Root Sale,** Glenville. Contact:R.D. Dishner, (304) 467-8893.
March 20	**West Virginia Total Performance Bull Sale,** 11 a.m., WVU Reymann Memorial Farm, Wardensville. Contact: Wayne Wagner, (304) 293-6131, Ext. 4205.
March 27	**West Virginia Southern Bull and Heifer Replacement Sale,** 11a.m., Jack Crank Farm, Rt. 35, Pt. Pleasant. Contact: Rodney Wallbrown, (304) 675-0888.
April 8-10	**West Virginia Beef Expo,** Jackson's Mill 4-H Conference Center, Weston. Contact: Wayne Wagner, (304) 293-6131, Ext. 4205.

Good contract benefits farm owner, tenant

By Tom McConnell
Farm Management Specialist, WVU Extension Service

The decision to lease your farm can be a wrenching experience emotionally. To many faced with this prospect, it means placing your life's work and homeplace in someone else's care. You are caught between the hope that your place will be used and maintained and the fear that it will be torn up and destroyed.

Once you've made the decision, however, you can look at the lease as a straightforward business deal. There is value to what you are "selling"—the use of your farm and its improvements. As the owner/manager, you should be able to maintain the farm as you wish and still receive income from it.

To get started, determine what you want to achieve from a lease agreement. Ask yourself the basic questions: Are there operations you won't tolerate? Are there fields you don't want plowed? Or, do you not want plowing at all? Are there enterprises you definitely want on the farm? Should you lease the buildings and for what uses? Should you lease the machinery?

You also must decide how you want the leased farm to look. Do you want it to look just like it does now? Will it bother you if your upland pastures are not clipped? Do you care if round bales are stored in the field?

Early discussions with your prospective tenant can help gauge your compatibility. If possible, a visit to your prospective lessee's farm will likely answer many questions about his or her housekeeping and management skills. Minor difference usually can be resolved. Major differences will probably tell you that this deal will not work.

Put it in writing

A good contract is the key to leasing success, and the only good lease contract is a written one. Every lease should include at least the following:

- An accurate legal description of the property, specifying any part of the property to be excluded
- The names and addresses of tenant and landlord
- A definite term that the lease is in effect and provision for renewal or termination
- Designation of the rent amount with time, place and method of payment specified
- Important details and conditions, such as hunting rights, posting rights and responsibilities, fence maintenance responsibilities, driveway use, etc.
- Signatures of tenant and landlord.

A lease listing all conditions will help both parties secure previously discussed and agreed upon management practices and conditions of use. This reduces the potential for disputes or misunderstandings later.

A written and signed lease will not only protect the original parties but the heirs and assigns. Your wishes will be protected in your absence. The contract legally preserves the specific date and provisions for renewal. It also furnishes the landlord proof of his or her share if the lease contains profit-share provisions.

Put lease to good use

For the tenant and landlord to be satisfied and for the business relationship to continue, the lease must be useful. A useful lease must include at least these requirements:

- Arrangements for a fair division of income and expenses between landlord and tenant
- Allowances for the tenant to farm profitably
- Assurance that the tenant will be able to continue the lease for a period of years
- Assurance to the landlord that the value of the property will be preserved
- Provisions for all legal requirements to be met, measured, and defended.

Legal issues

Before you initiate a lease, get your lawyer, banker and insurance agent involved! The guidelines here are just to get you started. Your family attorney knows your situation and knows how to protect your interests.

Get answers to these questions: Will you be liable for the activity with which your tenant is involved on your farm? If so, does your liability insurance provide for this? How much liability coverage do you need? If you still have debt against your farm, how is it affected?

Does your tenant have insurance to protect him or her, and ultimately you, if livestock gets out? How does your insurance

Decide how you want your farm to be maintained before you contract with a tenant.

policy cover you and/or your tenant for chemical spills and/or underground storage tank problems? Will your farm policy pay for buildings when a tenant is doing the farming?

What's a fair rent?

Once you've decided to lease and have started the process in consultation with your attorney, you must make the second hardest decision: What is this farm lease worth?

First, consider the production contribution that the farm can make to the tenant's operation. Is the farm productive? Are the improvements efficient for his or her operation? Is there water? Are the fences good? Answers to these questions will determine the suitability of the farm to the tenant's operation.

Next, look at the cash value of the farm. Does the lease amount reflect to some degree the market value of the farm? At one time, Corn Belt farmland leases reflected farm market value based on a 20-year payback. However, the market value also used to be tied to yield potential. Now, it tends to follow another demand curve.

West Virginia grassland is in great demand—so much that an attempt to tie lease figures to farm value would make the farm impossible to lease profitably. A relationship exists, however, between farm value and rental/lease figures and should be factored into your final decision.

Look at comparable farm lease amounts in your area. This may require some investigation. A quick study will reveal several different leasing relationships and costs. Careful consideration of what each figure means will help the landowner correctly interpret the information.

The logical sequence of lease value pricing includes comparing the estimated production value with the market value to see where your farm should be priced. It's logical to assume the most fertile farms with the best improvements will cost more to lease. Keep in mind that a good lease must be profitable for the tenant as well.

Types of leases

General leases vary as widely as the parties writing them but fall into four basic categories:

- **Cash lease**—Tenant pays a specified cash rent for use of the farm and its improvements.
- **Crop-share cash lease**—Landlord participates in decisions about land use, seed, and fertilizer and may share in fertility cost, crop expense, and maintenance of improvements. Rent usually ranges from a third to half of the grain yield. This agreement can be adjusted so that cash rent can be paid for other parts of the farm.
- **Livestock-share lease**—Landlord owns half of the animals, feed, and livestock equipment and receives half the income. Here, as in the crop-share lease, the landlord has more involvement in the operation. Rental income will vary widely due to the price variation.
- **Labor-share lease**—Landlord leases a fully equipped farm to a tenant. This gives the landlord the opportunity to transfer the use and responsibility of the farm to a beginner. Careful record keeping is very important.

Maintaining farm fertility

Seldom discussed in farm leasing decisions is the issue of the farm "fertility bank." Most crop leases stipulate that the same amounts of fertilizer and lime be applied annually. Grass farm leases often fail to include this important element.

A simple way to ensure that fertility levels are protected is through the use of a soil test on every field being used. This could involve an aerial map or farm plan map, matching soil tests with each field identified on the map. The land-lord could specify a regular interval for soil testing. If levels are low, the tenant would be required to correct the deficiency. •

7 Steps to Leasing Success

Are you a landowner who wants to become a landlord? Here's what to do:

1. Involve your attorney in the process.
2. Discuss lease provisions with your insurance agent and banker.
3. Arrive at a fair lease price.
4. Choose the right type of lease.
5. Consider your special needs,desires, and conditions.
6. Put it ALL in writing.
7. Communicate with the tenant before and during the lease period.

Program helps students make the ag connection

By Mary Beth Bennett
WVU Extension Agent, Berkeley County

Why should school students be taught about agriculture? The reason is simple: We are all involved in agriculture every day. Whether it's the food we eat, the clothes we wear, the sheets we sleep on, the medicines we use, or the homes we live in—agriculture is our "connection to life."

With farmers making up only 2 percent of our U.S. population and producing food and fiber for us all, many of our students have no idea where their food and clothing come from. Farmers provide an abundance of food products. The American family spends less than 10 percent of its total income on food—the lowest in the world. American agriculture employs 21 million people or 18.5 percent of the labor force in production, processing, distribution, and marketing.

United States agriculture provides a safe supply of food, which frees the rest of the people to pursue activities such as medical research, space travel, computer technology, art, music, literature, philosophy, and recreation. Simply put, U.S. agriculture is number one—this is reason enough to educate students about agriculture.

What is Ag in the Classroom?

Ag in the Classroom (AITC) is a nationwide program designed to help students develop an awareness and understanding of our food and fiber system and how agriculture impacts our daily lives. AITC provides training and resources to help teachers use agriculture as a vehicle to teach across existing curriculum. Teachers throughout the state can help to increase their students' agricultural literacy.

AITC does not attempt to replace existing school curriculum. Instead, materials enhance the subjects that teachers already teach. For example, science standards such as soils, natural resources, and microorganisms, can be taught using agriculture as the vehicle.

In this state, the Ag in the Classroom program is supported through the West Virginia Farm Bureau Foundation and the West Virginia University Extension Service. Several other agricultural groups and state agencies provide in-kind contributions.

AITC helps students learn the many ways that agriculture serves them, even if they've never seen a working farm.

Get involved!

Elementary school teachers (grades K-6) can become a part of the AITC program by attending the 1999 Summer Agriculture Institute. Please contact Mary Beth Bennett at (304) 264-1936 if you would like an application or more information. ●

Genetic advances making corn choices sweeter

By John Jett
Horticulture Specialist, WVU Extension Service

A genetic revolution has taken place in the world of sweet corn. Buying seed for this popular mainstay of home gardens and roadside markets is not nearly as simple as it once was.

If you're planning to raise sweet corn this year, pay careful attention to the kernel color desired, the genetic classes now available, and the maturities of the varieties within those groups. Plan for successive plantings at intervals to achieve a constant supply of fresh product.

Here are some of the various combinations to help you sort out by genetic classes:

Varieties suited to West Virginia

Early		
Sundance	**(su)**	**yellow**
Precocious	**(se)**	**yellow**
Seneca Horizon	**(su)**	**yellow**
Quick Silver	**(su)**	**white**
Quickie	**(su)**	**bicolor**
Main season		
Honey & Cream	**(su)**	**bicolor**
Super Sweet	**(sh)**	**yellow**
Silverado	**(se)**	**white**
Alpine	**(se)**	**white**
Late		
Kandy Korn	**(se)**	**yellow**
Illini Xtra-sweet	**(sh)**	**yellow**
Silver Queen	**(su)**	**white**
Seneca Dancer	**(se)**	**bicolor**

How sweet it is!

Normal Sugary (su) is the standard sweet corn you've grown through the years. It offers rich corn flavor and is best if picked and cooked the same day. Some varieties germinate quite well at soil temperatures of 55 degrees F. For best quality, keep it isolated from field corn.

Sugary Enhanced (se) varieties have a modifying gene that increases sugar levels in the kernels and extends their flavor. Moisture loss is also slower than in Normal varieties, and tenderness is improved. Some Sugary Enhanced varieties will germinate nearly as well under the same conditions. They, too, should be isolated from field corn, and they are slightly better tasting when isolated from Normal sweet corn. The so-called Sweet Gene hybrids are similar in most respects to Sugary Enhanced types.

Super Sweets or **Extra Sweets** have a shrunken (sh) gene that describes the light-weight, wrinkled seed of this group. This gene raises sugar levels even further, again extending their flavor. Moisture is also retained in this type, and shelf life is remarkably long. Growers should wait for ideal conditions for planting—soil temperature of at least 60 to 65 degrees F and ample moisture. Isolate shrunken corns from all other types of corn to maintain their eating quality.

As used above, "isolation" means keeping plants at least 250 feet apart, separated by an effective windbreak, or planting varieties with differences in maturity of 10 to 14 days. Remember, corn is wind pollinated.

Choose varieties suited to West Virginia conditions. You'll obtain best quality and highest production from varieties of the main season and late groups. Most gardeners, however, and some commercial growers also will want to plant a little of the early group. By doing so, they can add about 10 days to the beginning of the sweet corn eating season! ●

WVU UPDATE

The West Virginia University Extension Service and the WVU College of Agriculture, Forestry and Consumer Sciences are pleased to offer this educational insert to the Farm Bureau NEWS as a service to West Virginians. We welcome your questions or comments.

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