

Livestock News

Cumberland County Center

March 2015

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Upcoming Pesticide Classes in Hoke County

Classes will be held at the Extension Office on Tuesday, March 17.

- ◆ 2 hours of X credit, 2:00 p.m.-4:00 p.m.
- ◆ 2 hours of V credit, 5:30 p.m.-7:30 p.m.

Goat and Sheep Field Day

will be Saturday, March 21 from 9am-12 pm at Mike Herndon's farm (2543 Barlow Road Parkton, NC 28371). Topics include fecal egg counts, diseases, management practices, reproduction and forage management. Call 875-3461 to register by March 18.

Beef Cattle Field Day

will be on Thursday, March 26th from 4-6 pm at Ronnie Hammond's farm located at 7803 Rennert Rd. Shannon, NC 28386. Topics include cattle handling and facilities, diseases and health management, chuteside demo, pasture management, fly control and mineral programs. Call 875-3461 to register by March 24.

Pork Quality Assurance Class

There will be an adult PQA certification class on Wednesday, April 15 at 1:30 pm at the Bladen Extension Office. Call 862-4591 to register by April 13.

Wild Foods Cook-Off

will be held at the First Presbyterian Church located at 133 W. Ballard St. across from the Junior High School in Ellerbe on Friday, March 27th. Dish registration will start at 6 pm. Crystal Cockman from Land Trust for Central North Carolina will give a presentation about places to go and things to do outdoors in the Piedmont at 6:30 pm. She will focus on canoeing, hiking, camping, fishing, and hunting. Mark your calendar now so you won't forget to cook a delicious dish or come join the tasting party for only \$5 per person. If you would like to register a dish or receive a flier with categories and rules, please call 910-997-8255 or send an email to Tiff_Conrad@ncsu.edu.

Richmond County Adult Meat Goat Club Field Day

will be held on Monday, April 6th at 6:30 pm at the John McInnis Farm. It will be a hands-on field day to learn about hoof trimming, dehorning, vaccinations, deworming, fecal egg counts, selection, and marketing. Please call Tiffanee at 910-997-8255 or email at Tiff_Conrad@ncsu.edu to register and for directions.

Backyard Poultry Class

As part of Cumberland County Extension's Better Living Series, there will be a backyard poultry class on May 6th from 12:00 p.m.-1:30 p.m. at the Cumberland Extension office located at 301 E Mountain Drive in Fayetteville. Topics include breed selection, housing, health management, and local ordinances and regulations. To register contact Susan Johnson at 321-6405.

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Animal Waste Management News

By: Taylor Chavis, Livestock Extension Agent with N.C. Cooperative Extension in Robeson County



10-HOUR INITIAL ANIMAL WASTE OPERATOR CLASSES (OIC):

The next OIC class is scheduled for April 22 and 23 starting at 10am both days in Goldsboro. Call 919-731-1525 to register by April 2nd.

Mortality Management

Mortality Management is more than just a required part of your permit. A Mortality Management Plan should be included in the facility's Current Animal Waste Management Plan (CAWMP) and follow North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Veterinary Division statutes and regulations. The Mortality Management Plan requires the disposal of dead animals within 24 hours for normal/expected mortality rates. For mortality rates that exceed the normal/expected rate, disposal should be in accordance with CAWMP and NCDA&CS. Burial dates, number and type of animals should be recorded along with maps of the burial sites. Maps should be sent to Division of Water Resources (DWR) regional office within 15 days. If an emergency is declared, guidelines will be subject to the State Veterinarian.

The following are approved methods of disposal: burial, rendering, incineration, and composting.

Burial should not be the first choice for normal/expected mortality. If you must bury, dead animals should be buried 3 feet above the water table and must be covered with 3 feet of

soil (including mounding). Burial site must be located 100 feet from wells and 300 feet from stream, water body or public water supply well. The site of burial should not be in a tiled area of a drained field and should not be visible to neighbors or people passing on the roadways. Tree buffers are a good visual screen to use around burial sites. It is also important to restrict access to keep dogs and wild animals away from burial sites. Contact DWR and NCDA&CS for burial siting.

Rendering of dead animals can be expensive, but serves as a useful by-product. Incineration should be complete and done by the farm owner or operator. It is to be used for mortality only and must follow the visible and odorous emissions rule. Composting can be expensive, but can be used on and off-site. Use off-site requires a distribution permit by DWR.

It is required that all stocking and mortality records be kept. It is strongly recommended that a mass animal mortality plan be in place in case of emergencies. If your planned disposal method cannot be used, then use the back-up method, modify the plan or ask what should be done if unsure.

For more information on mortality management, please contact your local livestock agent or DWR regional inspector.

Hay Directory

North Carolina Department of Agriculture's Hay Alert is at <http://www.agr.state.nc.us/hayalert/>. Producers can call the Hay Alert at 1-866-506-6222. It lists people selling hay or looking for hay to buy. It is free to list your hay for sale on-line.

Forage Management Tips

From Production and Utilization of Pastures and Forages in North Carolina

March

- Fertilize cool-season grasses to increase production.
- Dig weed free bermudagrass sprigs and plant them before growth begins. Consider using a herbicide.
- Control winter annual weeds in dormant bermudagrass with herbicides, burning or grazing pressure.
- Watch for grass tetany as rapid grass growth and cool, wet weather prevails-supplement with high mag mineral.
- Scatter manure from areas where animals congregate.
- Fertilize cool-season grasses if not already done.
- Watch for symptoms of grass tetany.
- Fertilize warm-season grasses when dormancy breaks.
- Establish hybrid bermudagrass unless irrigation is available.
- Plant crabgrass and switchgrass. Plant seeded varieties of bermudagrass at the end of the month.
- Graze cool season grasses down to 2-4". Harvest for hay if growth is too rapid to maintain grazing pressure.

April

Harvesting Cereal Rye

By: Randy Wood, Livestock Extension Agent with N.C. Cooperative Extension in Scotland County

Cereal Rye or Annual Rye (not to be confused with Rye Grass) that has been overseeded into Bermuda can be a very difficult forage to manage and harvest. The patience of this plant is amazing. It can sit in a field pretty and green and 3 inches tall for almost four months without growing at all. One day in February or March however, it will suddenly start growing an inch a day. From the time it is 5 inches to around 2 feet tall, providing it has been properly fertilized, it is a pretty good forage that will provide a slightly better than adequate food source for cattle. Whether this be as green forage that is grazed, harvested as high moisture silage/haylage, or as cured hay, it will serve as a decent nutritional feed during its short life. Harvesting can be the tricky part. You have to be careful not to harvest too early in the spring or you will damage its re-growth potential, and conversely you cannot wait too late in the spring to start harvesting or the feed quality will decrease dramatically. It is the latter situation that usually gets most farmers. At about 2 ½ feet tall, annual Rye will start to put on a seedhead. This is known as the "boot" stage. This is the critical stage of development for rye that is intended to be harvested as a feed source for livestock. From this stage of development on, the plant will not put on any additional harvestable material, and the leaf and stem of the plant will start to harden and decrease in nutritional value. All the plants energy will now go into developing the seedhead, and once this is accomplished the plant will have completed its life cycle and will die. There is another issue with rye that takes place at this stage, namely palatability. Palatability is basically how good something tastes. Often times we do not think a whole lot about palatability in forages. Most of our grasses have very little changes in palatability during its life cycle. For Cereal Rye however, this is not true. After the boot stage of development, cows will often turn their noses up at rye, no matter how it is presented.

So what does this lesson in the life of a rye plant have to do with managing it as a forage? Knowing how the plant grows and matures is critical to properly harvesting it.

Grazing- Most cattle farmers that depend on rye in the spring will tell you the best way to deal with rye is let the cows harvest it for you. There is a lot of merit to this thinking. It is cheaper and easier to just graze across a field than to run a bunch of expensive equipment. There is an art to grazing management however,

especially rye. You cannot graze too early or too short in the winter or you will rob the plant of significant re-growth time once the weather warms up enough for serious growth to occur. Waiting too late to start grazing however can be even worse than grazing too early. Wait too late and palatability decreases. Couple this problem with an overabundance of plant material to choose from and instead of a uniformly grazed pasture you now have a stomped down mess. The secret is being vigilant and start grazing as soon as you can. Rye does much better in a rotational grazing situation. Properly managed rye will often give 3 or even 4 grazings if you rotate on and off on time.

If you can't graze a field however, rye can still be harvested mechanically. There are two ways of doing this.

The first is as hay. Rye hay can be dried down like normal grass hay (12%-16% moisture) and baled. Drying hay in March/April is difficult to do because of the low daytime temperatures. Rye hay that has been cut on time is fairly palatable, but only fair. Cows will eat it but not be wild about it. If cut too late though, often times you will have a lot of round bales that your cows will not eat. This leads us to rye haylage.

Haylage is rye that has been harvested at a high moisture (40%-50% dry matter) then is quickly wrapped or bagged so that it ensiles. This has an advantage in reduced drying time, but especially in palatability. Cows love haylage, they eat it like candy. The biggest misconception with this advantage is that better palatability means better feed. This is wrong. The feed value of rye will be set once it is cut. Whether you dry it to 50% or down to 12% will not affect the feed value at all. Just the taste.

Because rye is fairly more difficult to manage over bermuda it gets a bad reputation. Just realize that it is a different plant with a different growing cycle and treat it accordingly.

Temperamental Cattle Are Costing You Money

By: Justin Whitley, Livestock Extension Agent with N.C. Cooperative Extension in Duplin County

If you were to ask most cattle producers what is their number one criteria for culling a cow, they would likely say “If she’s open” and rightfully so. A cow’s job on your farm is to have a calf once every 365 days and if she’s running around open, she is just taking up resources and not giving you anything in return. A close second on the list of reasons for culling should be temperament. There are multiple university research studies that have shown that high stress cattle have decreased performance in growth, reproduction, and health. They also are more likely to injure you or themselves.

Research in Oregon has shown effects of temperament on reproduction in beef cattle. Over four hundred spring-calving range cows at two locations in eastern Oregon were tested for temperament using both a chute score and measurement of exit velocity from a squeeze chute. About 25% of the cows were scored as aggressive and these cows had lower pregnancy rates (89%) than the adequate temperament cows (95%). At one location, cows were bred by AI followed by turn out with a bull. The second location used natural service mating only. The lowered pregnancy rate even when bulls were used indicates that the effect was not due solely to stress during handling at AI. Based on this and other studies, the researchers suggest culling on temperament or adapting cattle to handling to maximize reproductive performance in beef cows. - See more at: <http://igrow.org/livestock/beef/temperament-and-cattle-performance/#sthash.EzQIZR1f.dpuf>

Temperament is a moderately heritable trait that can be selected against and improved in your herd over time. High stress calves have lower feed conversion, slower growth, and also have a lower response to vaccinations given at weaning. There are also negative effects on carcass quality and marbling. Further, research studies reported that excitable temperament increases the incidence of dark cutters, decrease meat tenderness, and also increase percentage of bruised carcasses. Therefore, temperament affects carcass not only by reducing ADG and consequently carcass yield, but also directly alters meat quality.

While being a “good mother” can be an important trait in a cow for protecting her calf, being too aggressive can have some serious negative consequences. One option for quantifying temperament is to monitor cattle

while being worked through the chute. A chute score is a 5-point scale (1 = calm, no movement, 2 = restless movement, 3 = frequent movement with vocalization, 4 = constant movement, vocalization, shaking of the chute, 5 = violent and continuous struggling) that can be assigned when cattle are in the chute. A similar scoring system can be applied to judge the speed at which cattle leave the chute. These can be effective methods of getting a feel of the whole herd, but most cattle producers are going to know who the high strung cows are and that’s a good place to start.

It is a much more enjoyable experience to own cattle and to work cattle when they are calm and easy going, and as mentioned before it is certainly more profitable. So how can you make improvements in the temperament of your cattle? In the short term, the quickest way to make improvements is by practicing low stress handling techniques. Educate yourself on point of balance, flight zones, and moving cattle with your body position instead of relying on rattle paddles, hot shots, and other methods of forcing cattle to go where you want them to go. Their stress levels and yours are much lower when they think it’s their idea when they decide to move. Spend more time out in your cows by giving them a bucket full of feed a few times a week so that they associate seeing you with something positive and get used to human interaction. The long-term solution is to genetically select for docility. Look at the cattle that you’re bringing onto your farm. Breed associations are now starting to provide a docility score on bulls, so that’s a good place to start. He’s responsible for 50% of the genetics on your farm each year! If you’re buying replacement heifers, make sure that they aren’t the “high headed”, “high strung”, “excitable”, “CRAZY” type. Then go back and implement some of those chute side scoring systems to remove those outliers from the current herd. Eventually you will start to enjoy owning and working cows more and you will see a reflection of that in your bottom line!

Getting Your Horse Back in Shape

By: Liz Joseph Lahti, Livestock Extension Agent with N.C. Cooperative Extension in Cumberland and Hoke Counties

Many horse owners will give their horse the winter off to have some rest and relaxation after a long show or trail riding season. As the next show and trail riding season approaches, it's time to start planning an exercise program to get your horse back in shape. This is something that takes time and should not be rushed. If a horse is brought back too hard too quickly, there is a much higher chance there will be soreness and injuries. Develop an exercise plan that matches the event you are working towards.

When beginning an exercise program for your horse, it is important to note its resting heart rate and respiration rate. These should be 28-44 beats per minute and 10-24 breaths per minute. A horse will have a lower resting heart rate as its fitness level increases. Once an exercise program is started, it should take a horse less than 20 minutes of rest to get its heart rate below 60 beats per minute. If it takes longer than this, the horse was over worked and your plan should be re-evaluated.

It will take about one month to see significant cardiovascular improvements once you start exercising your horse consistently. Start out with lower speeds over longer distances three to five days per week. It is important to give your horse time off every third or fourth day to prevent fatigue. As the horse's condition improves, heart rate recovery time will decrease. This is how you know you can begin to increase the workload.

Once the horse has some condition, start to incorporate interval training. Interval training for horses is just like that for humans, short intense exercise (approximately two minutes) with a period of rest. This type of exercise increases the body's anaerobic work, which leads to an increase in the amount of work that can be done before fatigue.

Don't forget to include a period of warming up and cooling down. Both of these will help minimize the chance for exercise related injuries. Warming up slowly increases body temperature and blood flow allowing the muscles and tendons to loosen up, increasing range of motion and avoiding tears and pulls. It is recommended to do five minutes of walking followed by five minutes of light trotting before moving into more demanding work. Cooling down gradually brings the horse back to its resting state. Do five minutes of light trotting followed by five minutes of walking.

During training, it is important to be able to recognize dehydration in your horse. Use the skin pinch method to test this. Pinch a fold of skin on the horse's neck near the shoulder and release it. The skin should flatten immediately if the horse is properly hydrated. If the horse is dehydrated it will take five to ten seconds, possibly more, for the skin to flatten out depending on the level of dehydration. To prevent this make sure your horse has a diet high in fiber. For every 2.2 pounds of dry hay a horse eats, it should consume up to one gallon of water.

No matter what you're doing with your horse, it's important to make sure they are in shape and can handle what you are asking of them. Use these tips to get your horse back in shape after it's had time off.



Caseous Lymphadenitis in Goats and Sheep

Written By: *Tiffanee Conrad, Livestock Extension Agent with N.C. Cooperative Extension in Richmond County*

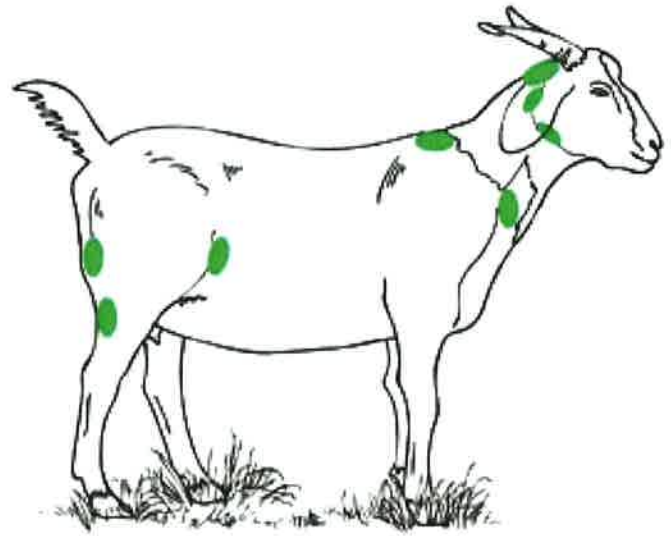
Several producers have been asking about Caseous Lymphadenitis or CL lately. I don't think it is because there is more of a prevalence of it, but I think more people are taking notice and paying more attention to their sheep and goats. If you have goats and sheep long enough, you will come across it. This disease was first recorded in the United Kingdom in 1990. It is believed to have been introduced there from a herd of goats that came from Germany.

Caseous Lymphadenitis (CL) is a chronic contagious disease that affects goats and sheep. It is also called pseudotuberculosis. It is an infection caused by the bacteria *Corynebacterium pseudotuberculosis*. Animals will get a swelling in the lymph gland, it ruptures, and then drains pus from the area. Decreased body weight and milk production also occurs, and reproductive efficiency is often lower when these animals have developed abscesses internally.

The enlarged lymph nodes have a very thick wall and are filled with green, yellow, or white pus. The pus is very thick and has the consistency similar to toothpaste. The most common lymph nodes affected are in the lower jaw, neck, head, shoulder, and udder. Please refer to the diagram (courtesy of Langston University) to see lymph gland locations. As the animal gets older, abscesses may develop around the lungs, heart, liver, kidney, and spinal cord. Internal abscesses are possible in goats, but are much more common in sheep. CL may cause weight loss, pneumonia, and neurological issues as well. Slaughter facilities normally identify and condemn abscesses in internal organs and the rest of the animal is processed for food. The meat is safe to eat after the affected areas have been discarded.

Corynebacterium pseudotuberculosis can be spread in the environment by broken and draining external abscesses. It survives in the environment for at least one year and can continually reinfect animals. It can be spread by shearing/clipper blades, fences, bedding, and feeders. It is also believed that insects and birds can carry the CL bacteria from infected animals nearby and spread it to other healthy animals. The bacteria enters the animal's body through small breaks in the skin or mucous membranes and then becomes localized in a lymph node. The CL abscesses are attached to the back side of the skin instead of the animal's body. CL is not transmitted through colostrum, milk, or bodily fluids.

A veterinarian can diagnose CL by culturing it and sending it to a diagnostic lab. Any diagnosed animals should be isolated and treated or culled from the herd/flock. It's important to use gloves, since CL is a zoonotic disease, which means people can also get the skin infection, although this is rare. The CL abscess needs to be opened and cleaned out at the right time. This is when the hair is beginning to come off, it is starting to be soft, and it can be pulled away from the body



by wrapping your fingers around it. If it is lanced too early when you can move the skin over it, the treatment will not be effective. If it is lanced too late, you risk it rupturing and the pus getting into the environment. The pus needs to be removed and not allowed to touch the ground. Your veterinarian will then normally treat it with iodine or formalin. Formalin is not labeled for CL infections, which is why the veterinarian is involved, not only because of the timing and knowledge of the lancing, but also because of the extra label requirements. Since the thick pus is inside a tough fibrous capsule, which medications cannot penetrate, antibiotics do not help to treat the CL bacteria.

There are other reasons that lymph glands can swell and abscesses become apparent that are not CL related. Many producers have caused more problems by treating abscesses as CL, when they actually were something else unrelated. Producers oftentimes confuse bottle jaw and thyroid problems with CL. They have also lanced them at the wrong time and injected too much formalin. There is a fairly new vaccine for CL for sheep and one for goats that has been out for a few years now. Producers have had good results with using it in their herds/flocks. If you see an abscess on a lymph gland on your sheep or goat, it's a good idea to take it to your veterinarian for testing. If you need help learning about your goats or sheep, please call your local Extension Agent for assistance.

Hitting Target Weight With Livestock Projects

By: Dan Wells. Livestock Extension Agent with NC Cooperative Extension in Johnston County

Many area youth are currently involved in raising livestock for spring shows. There are quite a few decisions to make regarding care and feeding of these animals. The focus of this article is to consider the desired end point for the animal, where to begin, and how much feed it will take to get there.

First of all, it is important to know what size animal to select when beginning your project. This is important because most shows have a "slot," or a weight range for each species that animals must weigh at the show. If you start with an animal that is too light it may not make the minimum weight, and if you start with an animal that is too heavy, it might be over the maximum. Sure, you can limit intake and "hold" the animal for a time, but there is some evidence that this leads to the development of more sinew and other connective tissues, leading to tougher meat. And animals that have been held often are tighter sided, shallower bodied, and just don't have the desired amount of "bloom" when they hit the showing.

You need to have a goal in mind- the finished, show-day weight of the animal. Consider the length of time that the animal will be on feed, the target weight appropriate for that animal, and the Average Daily Gain (ADG) the animal will need to achieve during that feeding period to reach that weight on show day. The tables below have some examples with typical feeding periods and ADG for each species.

Table 1. Typical ADG

	Steer	Hog	Lamb	Goat
Typical ADG lbs/day	2.5 – 4	1.5 – 2.5	.75 – 1.25	.3 – .5

Table 2. Typical Weights, Feeding Periods and ADG needed

Species	Target Weight	Begin Weight	Days on Feed	ADG needed
Steer	1300	800	150	3.33
Hog	265	80	90	2.05
Lamb	120	60	70	.86
Goat	75	45	70	.43

Note: ADG is calculated by (Target Weight – Begin Weight) / Days on Feed.

So, how much will your animal eat every day? Generally, there is a percentage of the animal's body weight that it will consume every day. That includes total intake of all feeds (grains, hay, etc.) It's important to weigh the feed often enough that you really have an understanding of how much you're feeding in weight, not in volume. And keep in mind that intake as a percentage of body weight will generally in-

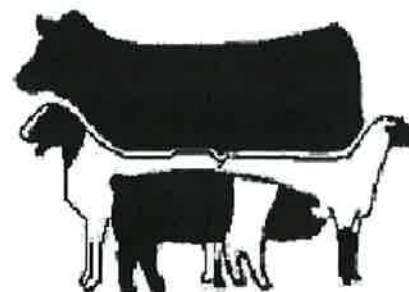
crease as the animal grows, so it's important to weigh the amount fed multiple times over the feeding period.

How much total feed will your animal eat over the entire feeding period? Here we have to think about how much the animal needs to gain to get to the target weight, and the Feed Conversion, also called Feed Efficiency, which is typical of that species. Feed Conversion is the amount of feed that must be fed for the animal to gain one pound of weight. Figure the amount needed to gain over the feeding period, multiplied by the typical Feed Conversion, to know how much your animal should eat over the entire feeding period. Some typical examples are in Table 3 below. Note this does not include waste, which is usually somewhere around 5 to 10 percent.

Table 3. Calculating Feed Amounts

Species	Amount/day (% of body wt.)	Amount to Gain	Feed Conversion	Total Amount Fed
Steer	2 - 3	500	7	3500
Hog	3 - 7	185	3	555
Lamb	3 - 5	60	6	360
Goat	3 - 5	30	5	150

Clearly, there is a science to feeding livestock projects, but there is also an art to it. Experience, knowing how feeds and supplements perform, and keen observations of the animals are critical in getting the animal to the right point on show day. Keep in mind that it is important to weigh your animals multiple times during the project to keep on course. Having an accurate weight of the animal is the only way to accurately calculate ADG and make course corrections in your feeding system.



Flies

By: Richard Goforth, Area Poultry Extension Agent with N.C. Cooperative Extension

Complaints about flies have been on the rise recently and poultry farms and the litter generated on them often get the lion's share of the blame. Any livestock operation can be an attractive breeding ground for flies and almost everyone could do something to help reduce fly populations, even homeowners. So what can you do to make sure you are being a good neighbor? The first step is to understand the basic concepts of fly reproduction, which will help identify and eliminate trouble spots.

Flies need moisture and decomposing organic matter in order for their eggs to hatch and the larva grow to adulthood. But since all animals produce manure, an excellent environment for fly eggs and larva, animal waste is usually the place to focus the most attention. For poultry growers and other livestock producers that do not use a liquid waste system, like most hog and dairy farms, the focus is on keeping the manure as dried out as possible. Maintaining litter moisture below about 25%; (which is the target to eliminate ammonia issues and maintain footpad health) will keep most fly eggs from hatching. It is also important to prevent feed spillage and promptly dispose of mortalities appropriately.

Composting poultry mortalities is an approved and effective way to dispose of carcasses and if done properly will not increase fly populations. It is imperative that composters are managed to insure they are reaching the proper temperature range of at least 1400 F so larva and eggs will be destroyed. Proper composting requires the correct carbon to nitrogen ratio, moisture level, and oxygen. Be sure to monitor for leachate from the composter and that any runoff is captured for reuse or treatment as this concentrated liquid can produce fly larva. If you need help with composting please contact your area poultry agent or livestock agent with extension or check out this link for a publication that covers the basics: http://www.ces.ncsu.edu/depts/poulsci/tech_manuals/composting_poultry_mortality.html

The other often overlooked area on farms is simply maintaining good drainage by not allowing standing water. This can be especially problematic if it is in a nutrient rich area such as animal pastures or where manure is stored, or spread.

Sometimes despite best management practices there may be high fly populations due to abnormally wet seasons and milder short winters. Growers may want or need to treat for flies under these conditions. Unfortunately pesticide fly control is very challenging. Since adults have such short life spans, killing adult flies does little to control populations for more than a few days. The fact that they fly and move so frequently makes it difficult to treat adults and we typically have to resort to baits, traps or residual surface treatments all of which are hard to do in poultry houses or most animal areas for that matter. First and foremost we cannot use something that is dangerous to the animals, or that could be passed into the food chain. This factor eliminates many choices for control. Contract growers also have to make sure they are using something approved by the integrator.

The other issue with pesticide control is most of the products available have become resistant to many fly populations and are not very effective. Some poultry farms are turning to a biological control of flies with the introduction of a parasitic wasp. There are several native species of parasitic wasps that prey on the common house and stable flies and researchers are studying some from Brazil and other locations to identify other predators that may be more effective at controlling fly populations. The wasp can be purchased from commercial insectaries and released periodically through the season. It is important to communicate with the company you purchase the insects from to identify the best species, and control program for success.

To learn more about parasitic wasp fly control check out these sites. <http://ars.usda.gov/is/ar/archive/aug02/flies0802.htm>

<http://www2.ca.uky.edu/entomology/entfacts/ef502.asp>