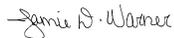


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NC State Extension works in tandem with N.C. A&T State University, as well as federal, state and local governments, to form a strategic partnership known as N.C. Cooperative Extension.

NC Egg Grading School for Small Producers
 The egg grading school is on July 19th from 8:30-4:30 pm in Raleigh. The class is directed at new and established small producers of natural/organic eggs, extension agents, and purchasers of locally grown products. If you want to learn more about proper methods of grading and evaluating the internal and external quality of the shell eggs you produce, this workshop is for you. The course includes a review of the North Carolina Egg Law and components that apply to small producers. The cost is \$50. To register, please go to: <https://www.ces.ncsu.edu/workshops-conferences/>

Upcoming Events

July

- 11th-Peach Field Day at Sandhills Research Station
- 12th-Local Food Demo “Un”Fried Chicken at the Farmers Market
- 20th-Showmanship Circuit Registration Dedline
- 26th-Local Food Demo “Stuffed Peppers” at the Farmers Martket

August

- 16th-Local Food Dem “ABC Panini” at the Farmers Market
- 21st-Summer Fun Wrap Up/Party
- 25th-Montgomery County Livestock Show
- 30th-Local Food Demo “Sliders & Peach Tea” at the Farmers Market

Pesticide Information

Classes at the Montgomery Extension Office

- September 13th 4 pm-2 hrs. of X credits
- September 13th 6 pm-2 hrs. of V credits

Classes at the Richmond Extension Office

- September 17th 7 pm- 2 hrs. of V credits.

Soil Sample Fees

Soil samples are now free. Starting in November they are \$4 per sample.

For any meeting listed, persons with disabilities may request accommodations to participate by contacting the Extension Office where the meeting will be held by phone, email, or in person at least 7 days prior to the event.

Disclaimer - The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by North Carolina State University nor discrimination against similar products or services not mentioned.

Animal Waste Management

Initial 10-hour Animal Waste Operator Classes (OIC)

- **Thursday Aug 2**, one day only. Starting at 9am at the Lenoir County Extension Office. Call Eve 252-521-1706 or email eve_honeycutt@ncsu.edu to register.
- **October 30 and 31st** at the Duplin County Extension Office. Class is 10am to 4 pm each day. Costs are \$35 for a manual and \$25 for exam fee. Call Duplin County office, Wanda Hargrove at 910-296-2143 to register.

6-hour Continuing Education Animal Waste Operator Classes

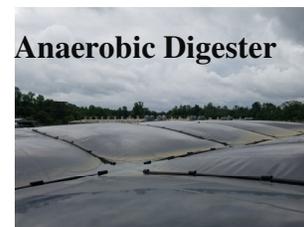
- **November 7th** at the Robeson County Extension Office. Call Taylor at 910-671-3276 to register or email taylor_Chavis@ncsu.edu.
- **November 28th** at the Cumberland County Extension Office. Call Liz at 910-321-6860 to register or email liz_Lahti@ncsu.edu.

Optima KV

By: Amber Long, Bladen County Cooperative Extension Summer Intern
Information from farm tour and NC Pork Report Winter 2017

A lot can occur in thirty seconds — even converting swine waste to methane gas. At maximum speed, the new biogas facility in Duplin County can capture methane gas from swine waste and inject it into the Piedmont Natural Gas pipeline in approximately thirty seconds. While the process is seemingly brisk, this project has been in the works since 2015.

Optima KV is one of several renewable energy projects working to capture methane from swine waste in North Carolina, but it is the first project in NC to inject that gas into the natural gas pipeline to be used by local utility companies. It also happens to be the first time NC has put natural gas into its pipelines from any in-state source. This system, like others, captures methane in an anaerobic digester that is similar in appearance and operation to a covered lagoon. Manure and waste from the animal barns are flushed into a synthetically lined and covered in-ground digester, which is located at each farm. Lift stations at the farms pump manure from the hog houses to the digester. The farms' former lagoons store effluent after it leaves the digester. The total nutrient content of the effluent is relatively unchanged by the digester, but nitrogen and phosphorus are converted to mineral forms that can be more readily taken up by plants. Naturally occurring anaerobic bacteria live within the digester and assist with the conversion of organic carbon to energy in the form of methane and carbon dioxide. The covered digester provides an optimal environment for the anaerobic bacteria. The waste inside the digester is agitated often to allow the bacteria to eat several times a day. A compressor at each farm filters the biogas for particulates and removes moisture, a process called pre-conditioning. This pre-conditioned gas is then transported to the central refinery through small diameter pipes.



Anaerobic Digester

At the refinery, a series of filtration processes occur on the molecular level to separate methane, or product gas, and tail gas. The product gas is pressurized and injected into a pipeline network owned by Piedmont Natural Gas, while the tail gas is flared. Duke Energy has committed to buying the biogas and estimates that Optima KV should yield nearly 11,000 megawatt-hours of renewable energy annually, which is enough energy to power about 1,000 homes for a year. Under NC's Renewable Energy Portfolio Standard law, electric utilities must meet specific compliance targets for swine and poultry waste, and this commitment will help Duke Energy meet these targets.



Refinery

Unlike other swine waste-to-energy projects, this system does not create electricity onsite; instead, an approach known as directed biogas is used. This approach has several benefits. Duke's power plants are more efficient than onsite generators, which creates more renewable energy with the same amount of renewable natural gas. This approach also allows farmers and project developers to bypass connecting to the electrical grid, where the interconnection can take several years. There are a few challenges to this approach, as the refinery equipment is relatively expensive and the locations where this exact model could work in NC are limited.



Refinery

There is much potential for this biogas model, however. NC is recognized for having a great bioenergy potential because of the opportunity to capture biogas from the swine industry. The Optima KV refinery is built for more capacity than is currently utilized, so the opportunity exists for more farms to be connected.

Teff— An Annual Hay Crop Option for NC

By: Dan Wells, Livestock Extension Agent with N.C. Cooperative Extension in Johnston County

In recent years, there has been increasing interest in summer annuals among pastured livestock producers in North Carolina. Most of this interest, however, has been focused on making use of summer annuals for grazing and the side benefits of improved soil health where this approach is implemented. That's all well and good, but sometimes a producer really needs to utilize a piece of ground that can't be grazed due to lack of water or fencing, or both. Add to this that many summer annuals are very tricky to utilize for hay due to thick stems that make drying and baling difficult.

For several years, I've had more and more producers express interest in and try raising Teff. This plant is a weeping love grass that is native to Ethiopia, where it is actually primarily harvested for its seed, which is used for making bread. As a forage crop, it produces a fine-stemmed, soft-textured hay that is prized as a palatable roughage. Hay sellers report excellent adoption from horse managers once they are introduced to Teff. Once established, Teff is quite drought-tolerant and quick growing, although yield is not as great as many other summer annuals. Seasonal yields of 2-4 tons/acre in 2-3 cuttings are fairly typical. Quality, on the other hand, is similar to other summer annuals, with the added benefit of smaller stems, softer hay and easier curing.

Planting

Teff should be planted once soil temperatures reach 60° F, or about mid-May in NC. Planting Teff can be tricky, mainly because the seed is extremely small. This small seed should be planted absolutely no deeper than ¼". Recommended seeding rates range from 4-5 lbs/ac for raw seed and 8-10 lbs/ac for coated seed. A firm seedbed is essential; if an adult's foot leaves a depression deeper than ½" the soil needs to be firmer. A good option is to disk and level the field well before planting, and allow rain and natural settling to firm the soil prior to planting.

Conservation-type seeders such as manufactured by Brillion and others are an excellent choice to plant Teff. A no-till drill with a small seed box can also handle Teff, but you would be best to remove the lower end of the tube from the furrow opener so that the seed is just deposited on the ground in front of the press wheels rather than in the furrow. It is possible to broadcast Teff seed, then level and firm with a cultipacker, but the seed may have to be mixed with sand or fertilizer to achieve a manageable flow through all but the smallest openings. Most seeders will need to be calibrated with Teff seed prior to planting as the crop is fairly new and most manufacturers do not have recommended settings for Teff.

Pest Control

Weed control can be a challenge with Teff, as with many crops. It is important to start with a weed-free environment because, although the mature plant is fairly hardy, seedling vigor of Teff can be poor. If the field is disked and leveled and allowed to pack prior to planting, any weeds that germinate in that period can be burned down with glyphosate just

prior to planting. Once the crop is up, post-

emergent options for broadleaf weeds are limited to Aim, 2,4-d and dicamba, which may be very unsavory options in areas near sensitive broadleaf crops. However, once Teff has formed a canopy it becomes difficult for annuals to germinate. There are essentially no options to selectively control grassy weeds in Teff. Research is ongoing to evaluate herbicides for this crop, so producers should stay alert for current developments, but always follow label guidance of any pesticide.

There are no known diseases or insect pests that are specific to Teff. However, fall armyworms, grubs and other common pasture pests may present a problem to this crop in certain situations.

Fertility

Teff should be planted where pH is 6 to 6.5 with moderate Phosphorous (P) and Potassium (K) availability. Nitrogen (N) needs are lower than that of bermudagrass. No more than 30-40 lbs/ac of N should be applied to the crop at one time or lodging may be an issue prior to harvest. Excess N may also lead to difficulty curing the hay. N may be applied at planting or once the crop reaches 5-6" height, and again after each hay harvest except the last cutting of the season. P and K needs are moderate, but it may be best to supply K equal to N in deep sandy soils.

Harvest

Hay should be cut once seedheads begin forming to capture the greatest quality. Teff is typically between 2-3' tall at maturity, and this typically occurs sometime around 50-60 days after planting. Fine stems allow for relatively quick drying, but use of a mower conditioner can still decrease drying time of this crop. Tedding is likely needed at least once to cure Teff for baling. I have seen no discussion or instance of making haylage from Teff, although it would almost certainly be feasible to do so at 40-60% dry matter. Still, most interest in Teff is focused on producing small square bales of dry hay for a demanding hay market. Depending on rainfall and fertility, Teff may be ready to mow again within 40-50 days of the previous cutting.

Because of its very shallow root system, Teff is not recommended for grazing. This is because animals could potentially pull up many of the plants in the act of grazing, which would drastically lower yield, allow for weed infestation, and can be deadly to horses. However, there has been some work in Virginia where Teff was mowed twice for hay, then the final regrowth was successfully grazed by stocker calves. At that point, the root system was more developed and uprooting was minimal.

I do not mean to imply that Teff is a silver bullet for the forage producer. There are challenges associated with this crop, and stand failures are possible as with any new planting. Still, there are situations where this crop has merit. If you are interested in trying Teff, please contact your Extension Agent for resources and assistance.

Water and Shade for Cattle in Summer Heat

By: Paul Gonzalez, Livestock Extension Agent with N.C. Cooperative Extension in Sampson County

Since it has gotten very hot over the past weeks, and it will only get hotter, I thought this would be a good time to discuss livestock water needs in extreme weather. We all know that water consumption will go up during hot weather. Of course, how much will depend on what animal species we are discussing, but you can count on at least double the winter water consumption for most livestock. So how much water is this?

A 1200 pound lactating cow will drink 15 to 25 gallons per day and in extreme cases, as much as 35 gallons. Bred cows and bulls will drink in the range of 12 to 20 gallons. Growing calves and yearling cattle will need 5 to 12 gallons per day, depending on their size. Sheep and goats will drink 2 or 3 gallons per day and growing lambs and kids 1/2 to 1 1/2 gallons. Hogs consume 1/2 to 6 gallons and horses 5 to 15 gallons per day.

These amounts should be kept in mind when choosing a tank or watering system. At a minimum, it should be large enough to supply 40 to 50 percent of your expected daily needs at one time. Ideally, your tank or trough will supply enough water for 2 or 3 days in one filling. This will provide a cushion in the event of a disaster or breakdown of some sort. Also, be sure your flow or supply to the tank is sufficient to fill the tank in a timely manner.

As a rule, unless the water supply is very close to the herd, all cattle will go to water at the same time. Most cattle will only drink for a short time and then move off to rest or graze. If the lower ranked animals in the pecking order show up to an empty tank, they will leave without consuming enough, or possibly any, water.

Finally, be sure that the tank stays clean. Clean water makes a huge difference in consumption and performance. A small amount of Clorox can safely be added to the tank to keep down algae growth if needed. Also, the tank or trough should be the only source of water for the animals. Cattle especially, will drink from the nearest water source. If that happens to be a mud hole, swamp, or pond, that is where they will drink.

I'm often asked the question, "Do cows have to have shade?". This usually solicits the typical extension answer, it depends. "Depends on what?" you ask. Well, lets back up a bit before we get to that.

Very little research has been done on brood cows and shade. What little information you will find, probably two or three trials, is probably from

Australia about 50 years ago. Most of the more recent research has been done with feedyard cattle. You can find tons of papers that deal with feedyards and shade. The majority of them indicate that there is a performance advantage to offering shade, in most cases a very slight advantage. Research that has been done with dairy cows indicates a performance advantage in offering them shade as well. Some more recent research indicates that it has a definite effect on reproductive performance in brood cows. On the other hand, many of the papers show little or no advantage to shade citing that the cost of shade is more than the increased income provided by the production advantage.

If you ask the specialists on campus, only one I know of will give you a definite answer. He insists they do not. In fact, he pointed out the fact that the research herd located at the Plymouth facility had no shade. He further points out that if you do offer shade, the cattle just bunch up together in the shade, limiting the cooling effect of the wind. I argue they do the same thing if they are in the sun!

So, getting back to the initial question. Do they have to have shade? Gun to my head, yes or no, probably not. Now I know you are thinking what is with the, "it depends" then?

If you have heat tolerant cattle, Brahman or Senepol influenced, you are not as concerned with shade. These cattle are adapted to hot climates and can handle the heat and humidity. Light colored and red cattle are a little more tolerant of the heat than black cattle as well. The other it depends is personal belief. Can you, or your wife, ride by the cows when it is 99 degrees and 90 percent humidity and see them standing in the blazing sun, with their mouths open, tongues hanging out, panting and drooling from the heat and be okay with it. I'm not trying to be a jerk here. I'm simply making a point. If it doesn't bother you, then you don't need to give them shade.

Really, the question here shouldn't be "do they have to have shade". We should be asking, "How does it look if they don't have shade?". With the growing animal rights/welfare movement, we can't afford to give those groups any more ammunition. In the eyes of the school child or soccer mom or anyone not educated in animal agriculture, the sight of those cows in the previous paragraph is totally unacceptable and someone will complain.

Keeping Your Horse Cool in the Heat

By: Stefani Sykes, Livestock Extension Agent with N.C. Cooperative Extension in Wayne County

As the sun starts to beat down and we start dreaming of beach vacations to cool off, it's important to remember that with the summer heat (and humidity) your horse's needs for water and care increase. Extreme temperatures can cause many health problems but there are some key things you can do to keep your horse cool and comfortable in the summer heat.

Most horses drink anywhere from 5 to 15 gallons of water per day. It is important that you have a constant supply of clean, cool water available to your horse. You should also have a way to bathe or spray your horses after exercising in the summer heat and fans to keep air moving in the barn. Shade is key to making your horse comfortable, whether they are at home in the barn or pasture, or at a world class show. Good ventilation in trailers is necessary, especially if you get caught in traffic while traveling. Make sure your horse is protected from infectious diseases and insect-borne diseases. The insects love to come out during the summer and your horse will be better protected if they are up to date on vaccines and you have a solid parasite protection program.

I mentioned trailering in the above paragraph and I'd like to spend a little more time expanding on that topic. Summer is prime time for riding, traveling, and showing. This means your horse will spend a lot of time in the trailer being shuttled back and forth to different places. When deciding what trailer to use (or buy), ventilation is key. Think about the size of the windows and

the air entering the trailer. Look for large feed door windows and ceiling roof vents that help with maximum air flow. Straight-load trailers provide better ventilation than slant-style trailers according to an article on www.thehorse.com. Dual-insulated walls often stay 10 degrees cooler than single walls.

There are some things you can do to prepare your horse for the best traveling experience, even in times of high heat and humidity. You can supplement with vitamins C and E, to help prevent stress-related immune problems. Use caution if providing electrolytes, make sure you offer water every few hours when using them to prevent dehydration. Teaching your horse to load and unload calmly means that they are less stressed when starting the trip, which is definitely a plus. Skip the sheet or lightweight blanket, while they may keep your horse clean and dust free on the ride, it also prevents the dissipation of heat.

Remember, travel during the coolest parts of the day and periodically stop and offer water every 4-5 hours. Some horses won't drink as much on a moving trailer. Avoid stopping and leaving your horse on the trailer, especially in the sun. Use common sense and think about things that make you uncomfortable when making sure your horse is cool this summer!



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Florida Cracker Sheep

By: Brian Parrish, Agriculture Extension Agent with N.C. Cooperative Extension in Harnett County

Anytime I see information on plants and animals that are adapted to and survive well in the Southeastern United States it catches my attention and sparks my interest. Florida Cracker sheep (Sometimes called Florida Native Sheep) crossed my radar a few months ago as I was researching sheep that can offer a higher degree of genetic parasite resistance. It seems more and more small farmers are becoming interested in raising sheep and when I talk with growers it appears that sheep can even be more profitable than cattle. One issue than can be a big problem with sheep is internal parasite control. The fact that Florida Cracker sheep demonstrate greater resistance to internal parasites than do both wool sheep and most other hair sheep breeds interests me.

Florida Cracker Sheep are believed to be descendants from sheep shipped to Florida in 1565 when the Spanish founded St. Augustine. These animals roamed free for some 450 years. Over the years, the sheep that survived adapted to Florida's rough conditions that include; extreme heat, humidity, hurricanes, wildfires and tropical storms. The sheep also had to evade Florida predators that include; alligators, bobcats, feral pigs, panthers, and even buzzards. Early settlers would round up the sheep twice a year for shearing and to mark lambs. They were allowed to free range until the end of open range in 1949, following WWII. Around 1950 the US sheep industry demand changed, with sheep of larger size that produced more wool and more meat being favored. Fortunately, since that time a few Florida families and the University of Florida helped save this unique breed from extinction.

Florida Cracker sheep are a medium sized dual purpose meat and wool sheep. They have wool on their bodies with hair on their face, belly, and legs. Florida Cracker sheep are proficient producers with high fertility rates. They are easy lambers, and have strong maternal instincts. Florida Cracker sheep ewes can breed back one month after lambing, and ewes can produce two lamb crops per year. Florida Cracker ewes usually bear twins, with some singles, frequent triplets, and occasional quadruplets. Ewes can weigh from 85 to 135 pounds and rams can weight from 135 to 200 pounds. With their strong parasite resistance, high lamb survivability, heat tolerance and excellent mothering instincts, Florida Cracker sheep seem to offer a great deal to a sheep crossbreeding program. An interesting example / website, Hopping Land and Livestock in Oklahoma run a large commercial crossbred hair sheep herd that is made up of ½ Katahdin, ¼ Dorper, and ¼ Florida Native genetics. It seems their goal has been to develop a more parasite resistant flock of hair sheep. They followed the advice of noted sheep researcher Dr. Charles Parker and added Florida Cracker rams to their breeding program to add more parasite resistance. They sell and ship sheep from Oklahoma to East Coast buyers. They also believe that sheep can be a good fit with existing cattle operations when good livestock guardian dogs are used.

Sources: The Livestock Conservancy, The Florida Cracker Sheep Association, Hopping Land and Livestock Web page.



4-H Farm Credit Showmanship Circuit

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

4-H youth are busy preparing for the start of the 2018 4-H Farm Credit Showmanship Circuit season. They have been selecting and purchasing their animals for the past month. Many of them get their animals as soon as school lets out for the summer or before. The entire Circuit is proudly sponsored by Carolina Farm Credit and Cape Fear Farm Credit. This funding is used to operate the Circuit. The county shows are in both Farm Credit territories, which makes it a great partnership. The first show will be held in Randolph County on August 3rd. Youth ages 5-19 have the opportunity to compete against other youth from across the region at each of the 12 County Shows between August and the State Fair in October. Youth can show goats, heifers or lambs as part of the Show Circuit. Points are accumulated for placings in showmanship at a series of shows in the South Central area of North Carolina. The Showmen will finish the season at the 4-H Farm Credit Showmanship Circuit Banquet held in November in Randolph County.

Youth compete in Showmanship and Confirmation classes at each show. The Showmanship classes are designed to gauge the 4-H'ers knowledge and skill with the animal while Confirmation classes are all about the animal itself. Females will be bred and will continue production on the farm. They are judged on their frame and structure based on how they would carry the extra weight of being pregnant and the stress of milking. Castrated market animals are judged on the total meat marketability of the animal. Rules, the schedule, and how to register are listed on the Richmond County Cooperative Extension website at: <https://richmond.ces.ncsu.edu/site-richmond-9/> You must register on-line this year through the Eventbrite system. The deadline to register is July 20th by 5 pm.

There are three divisions for all species. First place in each division will win a belt buckle and a banner ribbon, second place will win a banner ribbon, and third place through fifth place will win a tri-fold ribbon. Each youth participant receives a Circuit tee shirt. 4-H Showmen will also win ribbons, trophies, and premium money at each individual show. Some youth put their winnings into the bank to save it for college while others may use it to invest in next year's show animal. There are several college scholarships available for youth to apply for which are strictly for 4-H members or 4-H Showmen.

What these youth learn from showing livestock is only the beginning. They learn leadership skills, animal husbandry, record keeping, self-esteem, and responsibility to name a few. They make friends for life across the state and learn how to communicate with adults and other youth. The future of agriculture lies in our youth, as they are the future farmers, doctors, teachers and agricultural advocates in our community. This is why we want to send a huge thank you to our sponsors and to all the parents, friends and family of the showmen who support them throughout the show season! If you have questions about how to get involved with showing animals, please call me at 910-997-8255.



Troubleshooting Electric Fences

By: Adam Ross, Livestock Extension Agent with N.C. Cooperative Extension in Duplin County

“My box doesn’t work, time to buy something else.” “I had good voltage on the line last month, this month it’s dropped.” “I don’t understand why I can’t ever get my fence up to a higher voltage reading.” Have you ever said any of these? If you have, here’s some tips for figuring out what’s happening.

1. Is the energizer the culprit? – To keep it very basic, you will need a digital volt meter (not fault finder or light tester). Unhook your fence from the charger (turn it off FIRST!) and test the box itself from post to post. If you get a reading of less than 7kV, you may have a faulty energizer. At this point, contact the store you bought it from, or the manufacturer to get further instructions.
2. Grounding – check your grounds if you don’t have adequate voltage on the line. A very large part of the time, we can trace problems back to inadequate grounding. For a fence to have “adequate” ground there needs to be 200 volts or less on the ground system. Here is a simple test for your grounding system that should be done at least once a year, preferably in dry conditions:
 - A. Short the fence out at least 330 ft from the energizer (lay t-posts on it, hook wire to it and stick the bare end in the ground, anything you can short the fence with) until the voltage drops below 2,000 volts (2kV)
 - B. Test the farthest ground rod in your series from the box (if you have 3 rods, test the one that is farthest away) with a digital volt meter – this should have a digital readout and be in kilovolts (kV). The “light up” type testers aren’t sensitive enough to perform this. A word of caution – fault finding devices don’t work as well for this procedure. You should get a reading of 0, or a blank screen. If you get 200 volts (0.2kV) that is acceptable. However, anything higher than 0.2kV and you will need to install additional ground rods to your system until the reading on the ground drops below 0.2kV.
3. Fence construction – there’s more than one way to skin a cat, and there’s a million more ways to build a fence. First off, this test needs to be per

formed while walking. ATVs, pickup trucks, and golf carts may interfere with you hearing your fence properly. Most times if you have a drop in voltage, you will be able to find the short just by walking around and listening for the “pop”. Check all lead outs to your fence for tight connections, look at each post for insulators breaking down or otherwise missing. One other tip for checking is to occasionally test wood posts for voltage – you would be surprised at how many wood posts I’ve found with voltage from poor insulators allowing it to bleed through into the wood.

4. Fence wire – if you recently patched or added fence to your system and notice a drop in your voltage, make sure you’re using the proper wire and that your existing wire isn’t rusty. Rust equals resistance, and resistance will drop your voltage. Fencing wire needs to be 12.5 gauge galvanized high tensile for pasture applications. This allows for a greater flow of electrons and also provides exceptional longevity for the fence. If you have added smaller wire (14 or 17 gauge) to your system, you will notice a drop in the voltage just from the difference in wire size. The only difference in electric fences and water pipes is that water flows on the inside of the pipe and electrons flow on the outside of wire – my point here is that you get more water out of a 3 inch pipe than a 1 inch pipe, therefore you’ll get more power out of 12.5 gauge wire than you will 14 or 17 gauge.

This was a very basic troubleshooting guide, because every pasture system is different, and was constructed by different people for different applications. The one thing to remember is that we have to have functioning fences to successfully contain and control our livestock.

