

## HORTICULTURE

# The Noble Foundation Poly Pipe Hoop House

by Steve Upson / [sdupson@noble.org](mailto:sdupson@noble.org)



**Sometime** around 2000, I began demonstrating the use of high density polyethylene (HDPE) pipe in hoop house construction. My interest in using poly

pipe was primarily to find a lower cost alternative to steel pipe. Also during this time, many first time hoop house growers were using PVC pipe as a construction material only to have their houses destroyed in storms. In addition, a tremendous supply of used poly pipe, sometimes in lengths of several thousand feet or more, lay abandoned around oil fields across Oklahoma and Texas. If the pipe proved suitable for hoop fabrication, it would substantially reduce the cost of house construction.

From the beginning, we chose 2-inch-diameter SDR-11 poly pipe for our houses because it is a common size used in the oil field and is readily available at oil field supply companies. It is also used in geothermal energy systems. This pipe has a wall thickness of ¼ inch making it extremely durable. Because it comes in a roll, a pipe bender is not required to fabricate hoops. Because polyethylene is a product of natural gas, the cost of poly pipe will reflect the cost of natural gas.



Typically, the cost of SDR-11 poly pipe is less than an equivalent diameter galvanized steel pipe and more than an equivalent diameter PVC pipe.

Since poly pipe does not have the structural strength of steel pipe, we limited the width of our first houses to 10 feet. These houses performed admirably and did not exhibit the same deficiencies common to similarly sized free span PVC houses, namely hoop fracturing caused by over-flexing during high winds.

Our next structures were 14-foot-wide free span models. After four years and several modifications, we are pleased with the results. To reduce costs and make it easier to attach and

detach the poly film covering, we elected to use rope straps positioned over the top of the structure between the hoops as an alternative to poly fastener (Wiggle Wire) or lath to secure the film to the frame. As an added benefit, rope straps stabilize the hoops without the need for pipe purlins.

During early testing, we noticed that water tended to accumulate in the folds of the poly film when the poly was raised for venting. Standard operating procedure calls for closing the house during stormy weather. On one occasion, we failed to close the house during a storm and the house collapsed under the weight of water that collected in the folds of the cover. ▶

In response to this design flaw, we developed a method of venting the house without causing excess folding of the poly film. This venting method, called a split vent, enables the house to be vented along the sides of the structure without the need to raise the poly film along the sides of the structure. The split vent also enables venting without exposing tender vegetation to cold air, a common occurrence during late winter in houses equipped with roll-up vents.

Many people ask if 2-inch poly pipe could be used to construct hoop houses wider than 14 feet. My answer is possibly. I know of wider structures, but they are generally equipped with interior columns to provide support against collapse and purlins to stabilize hoop movement. Before constructing a free span structure greater than 14 feet wide using 2-inch SDR-11 poly pipe, build a small structure and evaluate its performance under your growing conditions.

The Noble Foundation poly pipe house is a hybrid, incorporating features of both permanent and completely portable structures. With the exception of the ground posts, every component of the structure can be disassembled. While the structure is designed to be portable, it is also suitable as a permanent structure. Equipped with the Noble Foundation portable end wall or a comparable end wall, the Noble Foundation poly pipe high tunnel hoop house offers the market gardener an alternative, cost competitive, season extension structure with a long service life.

Plans for constructing a 14-foot-wide X 36-foot-long poly pipe high tunnel hoop house are now available at no cost by contacting the Noble Foundation. The plans will also be available on the Noble Foundation website in early 2012. ■

## Winterizing Sprayers

by David Annis / dcannis@noble.org



**Finalizing the winter** livestock feeding program (hay and supplement) is a priority for producers at the end of each year. It's also a good time to look at another important fall/early winter activity: winterizing equipment, especially sprayers.

Even though our sprayers may not have received much use in the spring of 2011 due to the drought, expect them to get a good workout in 2012. Whenever introduced grasses do not grow and forage resources are over-used, expect weeds to be a problem the following year. Being prepared for spring means beginning during the winter. Before it gets too cold, thoroughly clean the sprayer to remove any chemical residues (follow the label directions for cleaning the sprayer) and remove any part(s) that could be damaged by freezing.

Start by removing the strainers and washing them by hand (wearing chemical-resistant gloves) with soapy water. Rinse them and either store or place them back in the sprayer where you can find them next season. Next, look closely at the nozzles, nozzle bodies and check valves. If you don't thoroughly clean nozzles and related hardware, chemical residue can build up over the winter and harden. This residue buildup can dramatically reduce the sprayer's performance. Are there old nozzles on the sprayer that haven't been changed out in a few years? If this is the case, you should budget for new nozzles. For what the new nozzles cost, they'll save in herbicide use and aggravation next year.

Remove nozzle tips, screens, check valves, caps and nozzle bodies from the nozzle body assemblies. Correctly plug the assemblies to keep spiders and insects from building nests in the hoses. Clean and rinse out the nozzle tips, nozzle bodies and check valves. Store the parts in a well marked container where you can readily find them next season. A tackle box or small toolbox makes a great storage unit for sprayer parts; just be sure to label the box "sprayer parts."

Store check valves at room temperature over the winter to avoid damaging them by freezing temperatures. Remove all pressure gauges, and cap the openings on the sprayer. Find a safe place to store the gauges where they will not be knocked around or freeze. Finally, circulate antifreeze through the sprayer and all lines. Loosen the caps on the nozzles' bodies so the antifreeze can completely fill the boom line. Tighten the caps when the boom line is full. This helps to reduce cracking and drying out of the hoses and reduces the amount of moist air trapped in the sprayer. Let the antifreeze sit in the valves and pump to avoid freeze damage and reduce rusting.

If possible, store your sprayer in the barn or out of the weather to reduce the amount of damage from sunlight hitting the hoses. If you have to store it outside, consider purchasing a tarp to cover it. The tarp may not last multiple years, but it will reduce the effects of ultraviolet radiation on your tank and hoses.

Although the number of winter chores seems to increase each year, it's still important to take care of equipment that could be damaged by cold weather. Winter preparation will ensure the equipment can be ready when we need it in the spring. In closing, it is a good idea to tag your sprayer with a note indicating where the sprayer parts are stored. This might save you time and money when you are ready to use the sprayer during the next season. ■

# Choose Your Agricultural Enterprise

By Jeri Donnell / jddonnell@noble.org



## Individuals new

to agriculture often seek direction on how they should get started with their agricultural business. As a consultant, I interpret this to mean

that someone needs help developing a checklist of steps to take in order to achieve a defined goal. Surprisingly, however, I find many of these “getting started” questions center around goal setting and “What should I do?” rather than “How do I do it?”. To those seeking direction, I hope the following quote by B.C. Forbes, founder of *Forbes Magazine*, strikes home with you as much as it did me: “A business, like an automobile, has to be driven in order to get results.”

You are the driving force behind your enterprise. If you think of an agricultural business as the automobile, then the make and model would be the agricultural enterprise. Each farm or ranch has different resource requirements (e.g., land, labor, financial obligations), as well as individual levels of associated risk and income potential. Educational resources are available for individuals new to agriculture who may be unfamiliar with traditional agricultural practices. The Noble Foundation ([www.noble.org](http://www.noble.org)), the Oklahoma Cooperative Extension Service ([www.oces.okstate.edu](http://www.oces.okstate.edu)) and the Texas AgriLife Extension Service ([agrilifeextension.tamu.edu](http://agrilifeextension.tamu.edu)) all have long histories in educating the public about agricultural enterprises and management practices.

The National Agricultural Statistics Service ([www.nass.usda.gov](http://www.nass.usda.gov)) also provides a wealth of information relative to each state’s agriculture industry.

Table 1. Rank and value of production by commodity for Oklahoma and Texas

Rank	Oklahoma		Texas	
	Commodity	\$ Value (millions)	Commodity	\$ Value (millions)
1	Cattle and calves	1,747	Cattle and calves	6,939
2	Poultry and eggs <sup>1</sup>	653	Broilers	1,650
3	All hay	510	Greenhouse and nursery	1,284
4	Hogs and pigs	474	Cotton, lint and seed	1,189
5	Winter wheat	370	Milk, wholesale	1,172
6	Milk production	152	Corn	1,002
7	Corn for grain	128	Sorghum grain	377
8	Cotton and cottonseed	118	Eggs	347
9	Soybeans	113	Wheat	325
10	Grain sorghum	41	Hay	263

<sup>1</sup>Broiler production including other domestic meat-type breeds. Turkey production not included.

Agricultural enterprises common to your state can be found in the Annual Statistical Bulletin, which is updated each fall. The latest bulletin for Oklahoma and Texas reports that cattle enterprises are the No. 1 valued commodity for both states. The remaining top commodities for Oklahoma and Texas can be found in Table 1.

Alternative agricultural enterprises can provide opportunities for those looking to distinguish themselves from other producers. These enterprises can include, but are not limited to, specialty fruits and vegetables; exotic flowers; bees and honey; and a variety of field crops. Agritourism – tourists visiting an agricultural operation – is another alternative agricultural enterprise. Oklahoma Agritourism ([www.oklahomaagritourism.com](http://www.oklahomaagritourism.com)), a part of the Oklahoma Department of Agriculture, Food and Forestry and the Oklahoma Tourism and Recreation Department, lists the following as possible tourist attractions: vineyards

and wineries; hunting grounds; guest ranches; trail rides; u-pick operations; mazes; country vacations; specialty crops or products; exotic animal breeds; farm and ranch activities; farmers markets; and birding.

The list of possible agricultural enterprises is endless. Many who are new to agriculture find this overwhelming. Focusing on only the enterprises you want to manage will narrow the list considerably. The Noble Foundation’s experience suggests that an agricultural operation is more successful when the owner/operator is truly passionate about the agricultural enterprise. While individuals experienced in agriculture can suggest possible enterprises that fit your current resources, remember that the choice is yours and yours alone. Think back to the quote by B.C. Forbes, “A business, like an automobile, has to be driven in order to get results.” The question to you then is what “make and model” do you want to drive? ■



# 2012: First Quarter Events

## **Vegetable Gardening Seminar**

This evening seminar will get you started on the right foot to establish a productive vegetable garden.

6:30 p.m.-8:30 p.m.

Jan. 17

Noble Foundation Kruse Auditorium

No Registration Fee



## **Recordkeeping for Ag Producers**

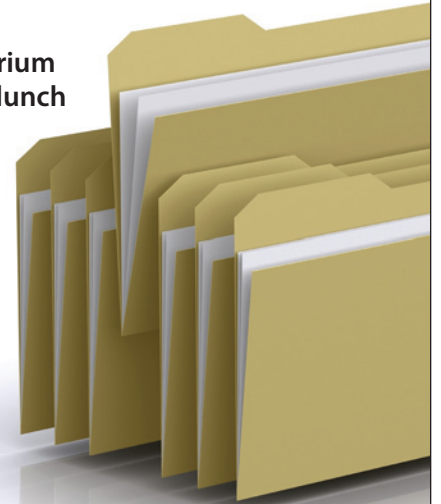
This seminar will communicate the importance of good record-keeping for your agricultural enterprise. Topics will include financial records to determine profitability as well as other production records used to make management decisions.

10:30 a.m.-3:30 p.m.

Jan. 19

Noble Foundation Kruse Auditorium

Registration Fee: \$20 - includes lunch



## **Prescribed Burn Workshop**

Topics will range from legal considerations and techniques for managing fire to environmental considerations and developing prescribed burning plans. Weather permitting, an afternoon demonstration burn will be conducted with an explanation of necessary equipment.

8:30 a.m.-5 p.m.

Jan. 31

Noble Foundation Kruse Auditorium

Registration Fee: \$20 - includes lunch





For more information or to register, visit [www.noble.org/AgEvents](http://www.noble.org/AgEvents), or call Tracy Cumbie at 580.224.6411. Preregistration is requested.

### Spring Cattle Workshop

Learn to apply EPDs in your selection criteria for bulls in the two most common cow-calf production scenarios: one in which replacement females are raised and one in which progeny are sold.

1 p.m.-5 p.m.

Feb. 23

Noble Foundation Pavilion

No Registration Fee



### Fertilizing for Profit Seminar

Attendees will learn about soil testing, the relationship between pH and liming, and best practices for application of nitrogen, phosphorus and potassium.

1 p.m.-4 p.m.

Feb. 28

Noble Foundation Kruse Auditorium

No Registration Fee



### Jr. Beef Spring Delivery

Final delivery of cattle enrolled in the Jr. Beef contest will take place at the Pasture Demonstration Farm.

3 p.m.-7 p.m.

March 5

Noble Foundation

Pasture Demonstration Farm



### Fertilizer and Weed Control Seminar

Consultants will discuss pasture fertilizer issues as well as weed and brush control. This meeting will be held in two locations.

1:30 p.m.-3:30 p.m.

March 13

Mid-America

Technology Center

Wayne, Okla.

No Registration Fee

1:30 p.m.-3:30 p.m.

March 27

Kiamichi

Technology Center

Atoka, Okla.

No Registration Fee

### Beef Quality Assurance Workshop

This seminar will help ranchers understand the necessary inputs for a quality beef product. Topics will include animal care, record-keeping, nutrition and carcass quality. Successful completion of a 20-question test will convey BQA certification to participants.

1:30 p.m.-4:30 p.m.

March 29

Noble Foundation Kruse Auditorium

No Registration Fee



# Be Prepared for Winter Weather

by Bryan Nichols / bmnichols@noble.org



## Stocker cattle

producers have many challenges to manage: animal health, increasing costs of inputs and fluctuating cattle prices. However, one

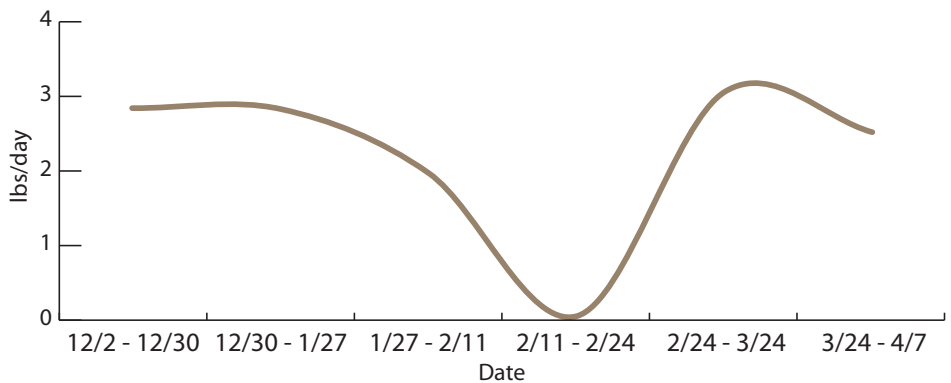
of the most difficult challenges may be Mother Nature. A Noble Foundation research project that began in late 2010 proves this point.

The project was to evaluate the potential of a new mineral supplement on stocker cattle health and performance. In December 2010, research pastures were stocked at one head per acre with the stocking rate increased to two head per acre in the spring. The treatment was administered weekly and poloxalene, an anti-bloating agent, was provided in blocks. Animals were backgrounded according to industry standards prior to the study, and weights were recorded every 28 days.

On day 61 of the study (Feb. 1), a winter blast hit the study site. We woke up that morning to snow, ice and 10 degree Fahrenheit temperatures. By Feb. 4, snow and ice forced destocking of the pastures. To maintain animal health and the study's integrity, animals were held in a common bermudagrass pasture, offered free-choice bermudagrass hay and limit-fed alfalfa hay at 15 pounds per head per day until the weather improved. On Feb. 11, conditions improved enough that cattle were placed back on their respective pastures, and the study resumed.

As expected, the stress of the winter storm significantly affected performance (Figure 1). When analyzing the results, we were surprised at

**Figure 1. Average Daily Gain of Heifers Grazing Cereal Rye Pasture**



the extent to which the bad weather had depressed animal performance. Even more surprising was the length of time (two weeks) it took the cattle to recover. This study provides a good illustration of why being prepared for bad weather is critical.

The stress incurred by cattle during this storm is not unlike the stress experienced during weaning. Many of the same guidelines apply in both instances. Immunity levels must be high for cattle to withstand high stress events; therefore, the vaccination protocol used when receiving these cattle is critical. Research has demonstrated that adequate mineral levels are needed to achieve optimal animal immunity. Offering a good quality mineral supplement at all times to stocker cattle grazing winter pasture will help to maintain the proper mineral balance.

In the event that cattle are unable to graze, good quality hay will be needed. The 2011 drought has made any type of hay difficult to find as well as very expensive. Do not wait to locate hay until it is too late.

As the temperature falls below the lower critical temperature (LCT) for beef cattle, energy requirements increase. Cattle that have grown a

winter coat and are able to remain dry have a LCT of 32 degrees. For every degree below the LCT, energy requirements increase 1 percent. For example, a steer gaining only 1 pound per day with an outside temperature of 10 degrees requires a diet containing 72 percent total digestible nutrients (TDN). Good quality grass hay contains 50 to 55 percent TDN, so cattle experiencing these conditions will probably only maintain or even lose some weight. In most cases, bad weather conditions last only a short time before grazing can continue. If bad conditions persist, however, energy supplementation may be needed to maintain acceptable animal performance.

Supplementation may come from one or more byproduct feeds such as soyhulls, dried distillers grains, corn gluten feed or other products that are available locally. Even if grazing is quickly resumed, animal performance will likely continue to suffer for an additional two weeks. The Noble Foundation encourages stocker operators to manage their animals after a significant weather event as if they were still stressed. Closely monitor animals for poor health and decreased forage consumption, and treat accordingly. ■

# Fall and Winter Management of Toxic Tall Fescue

by James Rogers / jkrogers@noble.org



**Language** describing tall fescue (TF) can be confusing. “Endophyte-free” means the plant does not contain a fungus – an endophyte – which is responsible

for TF toxicosis problems following grazing. TF toxicosis is generally responsible for fescue foot, loss of tail switch, rough hair coat and reduced animal performance.

In contrast, TF infected with a “novel” endophyte does not produce toxins that cause fescue toxicosis, but retains the qualities desired for a productive crop. Examples of novel-endophyte-infected TF varieties include Jesup MaxQ™, BarOptima PLUS E34™ and Texoma MaxQ II™.

Lastly, wild-type, endophyte-infected TF contains a toxic endophyte which is responsible for TF toxicosis. The most common toxic TF is Kentucky 31 (Ky 31+), though other varieties can also be toxic. Of the 35 million acres of TF in the U.S., the majority are toxic. If you have TF and you know that it is not a novel or endophyte-free variety, chances are good that you are dealing with toxic TF and may experience fescue toxicosis problems.

The Noble Foundation recently undertook a study that may shed some light on management strategies for dealing with toxic TF during fall and winter. Ergovaline is an alkaloid produced by toxic endophytes and has been implicated in TF toxicosis. Our study measured amounts of ergovaline contained in toxic Ky 31+ through

fall and winter. We also measured the impact of various applied nitrogen fertilizer rates on ergovaline levels in toxic Ky 31+.

Our study started in September with application of four nitrogen rates of 0, 60, 120 and 180 lbs/ac. Harvest began in November and continued monthly to May. Tillers were collected at each harvest from each nitrogen treatment and submitted for ergovaline analysis. The results from the first year of the three-year study are seen in Figure 1. The remaining years are still being analyzed, but first year

push production and delay grazing to January, allowing ergovaline levels to drop. Forages such as stockpiled bermudagrass or native grasses could be used prior to turning grazing cattle out on TF. This strategy may help reduce potential TF toxicosis problems during winter.

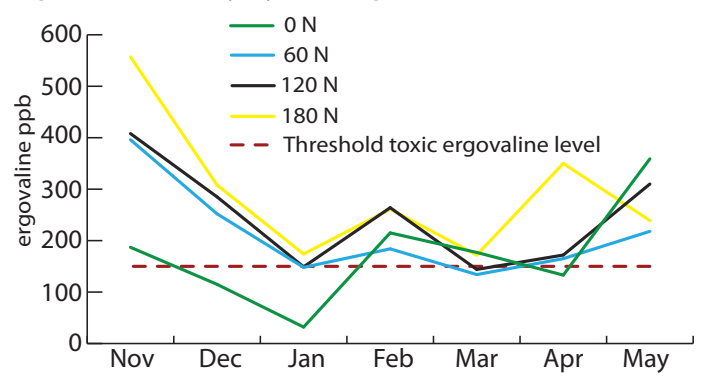
Looking again at Figure 1, ergovaline levels rise with the onset of spring growth in April. If cattle can be moved to forages other than TF at this point, toxicosis potential may be reduced. If you have excess spring growth of TF, consider putting it up as hay. Ergovaline levels have been shown to drop during the hay curing process.

If grazing cattle on TF can't be avoided during times when ergovaline levels may be high, there are other ways to deal with fescue toxicosis. One is to replace toxic-endophyte-infected TF with a novel endophyte TF. Another method is to dilute the toxic effect. There are three ways to do that: first, add a

legume to the TF stand so that cattle have something to consume other than TF; second, feed a concentrate while cattle are on TF; and, third, feed hay other than TF. ■

Kallenbach, R.L., G.J. Bishop-Hurley, M.D. Massie, G.E. Rottinghaus, and C.P. West. 2003. Hbage mass, nutritive value, and ergovaline concentration of stockpiled tall fescue. *Crop Sci.* 43:1001-1005. Stamm, M.M., T. Delcurto, M.R. Horney, S.D. Brandyberry, and R.K. Barton. 1994. Influence of alkaloid concentration of tall fescue straw on the nutrition, physiology, and subsequent performance of beef steers. *J. Anim. Sci.* 72:1068-1075.

**Figure 1. Monthly Ky 31+ ergovaline concentrations**



results follow a pattern seen by other researchers (Kallenbach, et al., 2003). Ergovaline levels are given in parts per billion (ppb). The dashed red line is an ergovaline threshold level of 150 ppb. It has been suggested that beyond this level of ergovaline, TF toxicosis problems can occur during winter (Stamm, et al., 1994).

With application of nitrogen, ergovaline levels are above the 150 ppb threshold in November, but drop to around 150 ppb by January. A possible management strategy to avoid high levels of ergovaline would be to apply nitrogen in late summer to



## CONTENTS

### Page 1

The Noble Foundation Poly Pipe Hoop House

### Page 2

Winterizing Sprayers

### Page 3

Choose Your Agricultural Enterprise

### Page 4

Upcoming Events

### Page 6

Be Prepared for Winter Weather

### Page 7

Fall and Winter Management of Toxic Tall Fescue

## EVENTS

### Tax Update Seminar

Date: Dec. 13, 2011

Location: Noble Foundation Kruse Auditorium

Time: 1:30 p.m.-4 p.m.

No Registration Fee

### Vegetable Gardening Seminar

Date: Jan. 17, 2012

Location: Noble Foundation Kruse Auditorium

Time: 6:30 p.m.-8:30 p.m.

No Registration Fee

### Recordkeeping for Ag Producers

Date: Jan. 19, 2012

Location: Noble Foundation Kruse Auditorium

Time: 10:30 a.m.-3:30 p.m.

Registration Fee: \$20 - includes lunch

For more information or to register, please visit [www.noble.org/AgEvents](http://www.noble.org/AgEvents), or call Tracy Cumbie at 580.224.6411. Preregistration is requested.

Contents ©2011, The Samuel Roberts Noble Foundation, Inc.

*Ag News and Views* is published monthly by the Agricultural Division of The Samuel Roberts Noble Foundation. Current and past editions of *Ag News and Views* are available at [www.noble.org/ag/news\\_views](http://www.noble.org/ag/news_views). Free subscriptions delivered by email are available at [www.noble.org/ag/news\\_views/NVsignup.html](http://www.noble.org/ag/news_views/NVsignup.html). The Noble Foundation encourages the republication of *Ag News and Views* articles. For publication guidelines, please see the information at the bottom of the page at [www.noble.org/ag/news\\_views](http://www.noble.org/ag/news_views), or contact Scott McNeill, Director of Publications and Visual Media at [jsmcneill@noble.org](mailto:jsmcneill@noble.org). High quality electronic versions of photos and graphics are available.

Address Service Requested

THE SAMUEL ROBERTS  
**NOBLE**  
FOUNDATION  
2510 Sam Noble Parkway  
Ardmore, Oklahoma 73401  
Phone: 580.223.5810

Non-Profit Org  
U.S. Postage  
**PAID**  
Permit No 2000  
Okla. City, OK