

Pike County Extension ANR Updates

Pike County Extension Office | 148 Trivette Dr. | Pikeville, KY 41501

Folks,

I'm doing the Newsletter a little differently this month. Pretty much everything you read this month is part of a longer article, published by the College of Ag. I tried to shorten everything down until it gets right to the point. If you wish to know more information, please let me know and I'll make sure you get the full article. Part of it, I want your input into which trainings you would like me to concentrate on first. I will be setting up a couple more trainings for the Farmers Market Safety requirements, another mushroom workshop, another grafting class, plus some marketing and computer classes for your farm and for doing a PPT of any type. For your input—email me at sstum1@uky.edu or call our office and talk to me @ 606-432-2534.

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Spring Tornado Safety

By Jane Marie Wix - National Weather Service Jackson, KY (in coordination with Kentucky Emergency Management)

Each year, the United States experiences an average of 1,200 tornadoes. Many strike rural areas and cause little damage, and most have paths well under one mile in length and winds under 100 mph. However, a few tornadoes can become large and violent, with wind speeds approaching 200 mph, tracking tens of miles and leaving swaths of destruction and death. In Kentucky, tornadoes have occurred during every month of the year and at every hour of the day. However, they occur most frequently from March through June and typically between 3 and 10 PM. Nighttime tornadoes are often more dangerous as they are harder to see and most people are sleeping.

So what do you do if there is a tornado? How do you stay safe?

Before a Tornado

- Have a family tornado plan in place and practice a family tornado drill at least once a year.
- Have a predetermined place to meet after a disaster.
- Learn the signs of a tornado: dark, greenish sky; large hail; dark, low clouds; and loud roaring sounds.
- When a tornado watch is issued, practice your drill and check your safety supplies.
- Increase your situational awareness by monitoring the weather on weather.gov, watching local TV, or listening to NOAA Weather Radio.
- Flying debris is the greatest danger in tornadoes; so store protective coverings (e.g., mattress, helmets, sleeping bags, thick blankets, etc) in or next to your shelter space, ready to use on a few seconds notice.
- Tornado rule of thumb: Put as many walls and floors between you and the tornado as possible!
- If you are planning to build a house, consider an underground tornado shelter or an interior "safe room".
- **In a mobile home: GET OUT!** Go to a neighbor's house, underground shelter, or a nearby permanent structure. Most tornadoes can destroy even tied-down mobile homes.

During a Tornado

- Wear a bicycle or motorcycle helmet to protect your head and neck or cover your head with a thick book.
- **In a house with a basement:** Avoid windows. Get in the basement and under some type of sturdy protection (heavy table or workbench), or cover yourself with a mattress or sleeping bag. Know where very heavy objects rest on the floor above (pianos, refrigerators, dressers, etc.) and do not go under them. They may fall down through a weakened floor and crush you.
- **In a house without a basement, a dorm, or an apartment:** Avoid windows. Go to the lowest floor, in a small interior room (like a bathroom or closet), under a stairwell, or in an interior hallway with no windows. Crouch as low as possible to the floor, facing down. A bath tub may offer a shell of partial protection. Even in an interior room, you should cover yourself with some sort of thick padding (mattress, blankets, etc.), to protect against falling debris in case the roof and ceiling fail.
- **In a car or truck:** If you are caught by extreme winds or flying debris, park the car as quickly and safely as possible - out of the traffic lanes. Stay in the car with the seat belt on. Put your head down below the windows; cover your head with your hands and a blanket, coat, or other cushion if possible. If you can safely get noticeably lower than the level of the roadway, leave your car and lie in that area. Avoid seeking shelter under bridges.
- In the open outdoors: **lie flat and face-down on low ground, protecting the back of your head with your arms. Get as far away from trees and cars as you can.**

After a Tornado

- Remain calm and alert, and listen to the radio or TV for instructions from authorities.
- Keep your family together and wait for emergency personnel to arrive.
- Carefully render aid to those who are injured.
- Stay away from downed power lines.
- Watch your step to avoid broken glass, nails, and other sharp objects.
- Stay out of any heavily damaged houses or buildings.
- Do not use matches or lighters, there might be leaking natural gas pipes or fuel tanks nearby.



Image Courtesy of the Lexington Herald Leader (Lexington, KY)

Marketing for All

Adaptable Marketing Training for Small Farms

Marketing Basics

We'll talk Product, Price, Place, and Promotion as well as key variables specialty crop marketers should consider.

Social Media Basics

This intro course shows how small businesses can use social media to reach new customers and learn about what their clients want.

Basics of Web Design

Designing simple professional online content is now possible for even the most computer illiterate among us. We touch on principles and tools to get you going.

Hands-On Visual Merchandizing

We take a show-don't-tell approach to learning about display design. Participants can brainstorm and discuss the merits of different designs in a hands-on workshop.

Market Signs That Work

Whether you are getting people to your market or business or trying to communicate with them once they've arrived, this workshop can help.

Identifying and Exploring New Markets

There are pros and cons to every market channel. Learn how to find and compare opportunities to grow your business.

Understanding and Using Analytics

Big companies collect BIG data. Learn how you can leverage their technology for your business.

Record Keeping for Specialty Crops

It's not the most exciting course on the list, but record keeping tells you how your business is doing. We focus on basics and making small changes for big results.

Using Price Data to Make More Money

Once you've figured your costs, how do you set your price? We show how to use CCD price data to make sure the price is right.

Value-Added Product Development

Value-added production is one of the big steps many of our producers take. We make sure you know the lay of the land before you get started.

Accepting More Than Just Cash

Customers don't always carry cash any more. We take a look at how and why you may want to think about taking plastic.



Each training lasts ~ 1 hour.

Mix & match topics to meet your group's needs.

To schedule: [email brett.wolff@uky.edu](mailto:brett.wolff@uky.edu) or [call 859-218-4384](tel:859-218-4384)

Home Gardening Offers More than just Nutritional Benefits

"Involvement in gardening helps promote healthy habits."

-Rick Durham UK Extension Consumer Horticulture Specialist

By Aimee Heald-Nielson Published on Jul. 23, 2004

LEXINGTON, Ky.—Everyone knows it's a good idea to eat fruits and vegetables. Doing so adds nutritional value to meals. But growing vegetables at home may offer more than added nutrients to family meals. University of Kentucky Extension Consumer Horticulture Specialist Rick Durhamsaid that gardening, in one form or another, is considered the most popular hobby in the United States. "Involvement in gardening helps promote healthy habits," he said. "It's good exercise and homegrown vegetables are good for health as well. Fresh vegetables are loaded with vitamins, antioxidants and fiber, all of which play a role in cancer prevention and general good health." According to the American Cancer Society, a 150-pound person can burn about 324 calories in one hour of gardening. That's about the same as doing low-impact aerobics, playing softball, walking at a fast pace and even playing with kids for the same amount of time. Lori Rice is an Extension associate of the University of Kentucky Health Education through Extension Leadership (HEEL) program. The program recently introduced an initiative that encourages Kentuckians to "Get Moving!" "We encouraging Kentuckians to increase the activity in their days in any way they can," she said gardening would equal four Physical Activity Miles (PAMs). "Get Moving Kentucky! defines one PAM as 15 minutes of sustained activity. Durham said when most people think of a garden they imagine a large field that has been plowed with neat rows, spaced three or four feet apart to allow cultivation by a tractor or tiller." Gardening on such a large scale is impossible for city dwellers," he said. "However, you'd be surprised at the amount of vegetables that can be produced in a very small area. "Gardening in small spaces doesn't leave much room for spacing plants out very far, but Durham said that's okay. "Most plants can be spaced a foot or less apart," he said. "Also, planting plants in beds reduces the need to walk in or closely around your plants. This reduces the chances of soils becoming compacted so they won't need frequent tilling. "Consumers can even grow a few vegetables in containers on patios and balconies if they don't have a yard. Durham said one key to this type of intensive gardening is to grow plants in succession. Some plants do well in cooler weather of spring and fall, while others thrive in summer months. "By careful planning, you can have a spring, summer and fall crop of vegetables" he said. "And some crops like beans or squash mature in only 6 to 8 weeks. So, it may be possible to have multiple plantings over the garden season. "For more information on home gardening, contact your local Cooperative Extension office. Ask for publication ID-128, Home Vegetable Gardening in Kentucky. It contains general information on raised bed gardening and also tips and instructions on growing many types of vegetables. Another helpful publication is ID-133, Vegetable Cultivars for Kentucky



Which Grasses Should You Plant in Your Pastures? Seed Selection for Pasture Renovation

As equestrians, we know that we must be somewhat selective of the mounts we choose. While exceptions exist, Quarter Horses tend to make better reiners than Saddlebreds, Warmbloods tend to make better jumpers than Arabians and Belgians tend to make better pullers than, well anything that isn't a draft horse. It's also no surprise that within each breed or discipline, some lines or family groups are just better at a specific skill than others. We like to think that selecting grass for our pastures is simpler, but the truth is, there are better species for different situations, and within each species, some varieties will perform better under certain conditions or geographical areas. Hopefully, this information will help you to select species and varieties of grasses for you fall planting.



FIGURE 1: KENTUCKY AND SURROUNDING STATES ARE PART OF THE TRANSITION ZONE AND HAVE CLIMATES THAT ALLOW BOTH WARM AND COOL SEASON GRASSES TO GROW, THOUGH, FOR KENTUCKY, COOL SEASON GRASSES AND LEGUMES ARE IDEAL IN MOST SITUATIONS. GRAPHIC BY UK AG COMMUNICATIONS

Species Selection

The biggest factor in selecting species is where in the country are you located, though use will also have some impact. Grass (and legume) species can be divided into warm season and cool season grasses. Warm seasons, such as bermudagrass and bahiagrass, thrive in warm climates, such as those found in the Deep South. Cool seasons, such as tall fescue and Kentucky bluegrass thrive best in the cooler northern regions. Kentucky and neighboring states are located in the transition zone, meaning that both warm and cool season grasses can be maintained, though cool seasons are the primary pasture grasses. Intended use can impact species selection as well and are best explained by example. The University of Kentucky Veterinary Science Department was interested in replanting a pasture that gets heavy use, but only in the summer months. For this reason, bermudagrass was recommended as it is high yielding and grazing tolerant and mainly productive in the summer months.

In another example, small paddocks that are usually grazed hard are often seeded with perennial ryegrass for its quick germination and inexpensive cost. Perennial ryegrass typically has the highest concentrations of water-soluble carbohydrates (WSC) of the cool season grasses, so some farms with overweight and/or founder-prone horses will decide against it.

Variety Selection

Like selecting an equine bloodline for racing or jumping, variety selection requires a bit of research, but pays off in the end. Seed can be of two types, “commercial” are those of improved varieties with known and proven genetics or “common,” seed that has unknown parentage and performance. Common may also be listed as “variety unknown or variety not stated.” This is equivalent to a “grade” in horses. With common seed, you may be getting a great variety, or you might be getting something that didn’t perform well or is mixed up with other seed. Common seed is often cheaper, but like buying horses, you get what you pay for. For this reason, we suggest only purchasing certified seed of a known variety and one adapted to your area and use.

Many universities, including UK, perform side-by-side comparisons of varieties to measure yield and persistence. In fact, UK has one of the largest forage variety testing programs in the country. Data from the trials is published annually in a series of reports and a summary report that can be found on the UK Forage Extension website (forages.ca.uky.edu).

In Table 6 of the 2019 Timothy and Kentucky Bluegrass Report, you’ll find the forage variety results of a comparison of five Kentucky Bluegrass varieties seeded in the fall of 2017. In this case, Maturity and Percent Stand were quite similar for most varieties. But the yield is where the differences lie, particularly in the two-year total. Those that have a * after the number were not statistically different than the highest producing variety, in this case, Barderby. So Ginger performed as well as Barderby, but Balin, Park and Tirem did not. If yield is your sole focus, then one of these two would be the best variety for farms in the Lexington area. Keep in mind though this is only one test.

The [2019 Long-Term Summary of Kentucky Forage Variety Trials](#) combines data from tests from the last 30 years. Table 26 from this report shows the horse grazing tolerance of orchardgrass since 1999. For this table, the key is to look at the mean listed on the far right hand side of the table. Any number

over 100 means that variety has performed better than average. The number in parenthesis tells you how many total tests that variety has been in, so give more favor to those with larger numbers because they have performed consistently over more time. For orchardgrass in Lexington, Benchmark Plus or Persist did best under horse grazing.

Choosing a proven variety backed by university data will give you confidence that you have chosen the most adapted variety available to your area and use.

Beware of “Horse Pasture Mixes”

Most agronomists will suggest you plant a mixture of grasses, instead of just one species. Quality mixtures are stronger because when weather and management become less favorable for one species, it likely will favor another. For example, Kentucky Bluegrass thrives in the cool, wet spring. But as conditions turn dry, tall fescue will outperform it.

Species	Benefits	Limitations
KY Bluegrass (cool season grass)	<ul style="list-style-type: none"> • Thrives under close grazing • Early spring green-up • Fills in bare areas to form a dense sod 	<ul style="list-style-type: none"> • Becomes brown and does not perform well in hot, dry conditions
Tall Fescue (cool season grass)	<ul style="list-style-type: none"> • Tolerates hot, dryer conditions better than most cool season grasses • Good yield 	<ul style="list-style-type: none"> • Could be infected with endophyte toxic to broodmares • Does not thrive in shade
Orchardgrass (Cool season grass)	<ul style="list-style-type: none"> • Good yield and palatability • Establishes well into existing sod because of good shade tolerance 	<ul style="list-style-type: none"> • Typically only survives in stand four to five years • Does not tolerate long periods of close grazing
White Clover (cool season legume)	<ul style="list-style-type: none"> • Good forage quality • Aggressively spreads into bare areas 	<ul style="list-style-type: none"> • Can overtake some stands if grazed close • Can cause founder, colic or weight gain when present in excessive amounts
Bermudagrass (warm season grass)	<ul style="list-style-type: none"> • Excellent yield and persistence 	<ul style="list-style-type: none"> • High fertilization requirements • No spring or fall growth • Limited winter survivability • Turns tan in winter
Perennial Ryegrass (cool season grass)	<ul style="list-style-type: none"> • Quick to establish • More forgiving during establishment with high seedling vigor • Excellent yield 	<ul style="list-style-type: none"> • Limited survivability, two to three years • High water soluble carbohydrates

It is tempting to take the easy and often cheaper option of pre-mixed “horse pasture mixes” available at many local farm stores. Before you purchase any of these, be sure to read the seed tag and see exactly what is in that mix. It could be a high quality mix, but there are too many examples that are more of a catchall of leftover seed. These may contain high amounts of timothy, an excellent horse hay but poor pasture grass. Or they may contain common seed or varieties that have not performed well in the area. Many contain high percentages of ryegrasses, which will provide some quick cover, but won’t last. The germination percentage may be significantly lower than that of improved varieties as well. Germination percentages of 90% or higher are desired.

Many farm stores will allow you to request a custom mix, often at no additional fee, which allows you to decide what varieties of each species you want, and in what mixture. This is well worth the time and energy. Our suggested horse pasture mix for central Kentucky can be found in [Establishing Horse Pastures](#).

Tall Fescue

This cool season grass requires an added level of consideration. Because naturally occurring tall fescue is often infected with an endophyte toxic to broodmares and cattle, extensive research has gone into developing new, safe varieties of tall fescue. As a result, there are more varieties of tall fescue commercially available than most other grasses, and greater performance differences among them. There is also tremendous misunderstanding surrounding tall fescue varieties, so take the time to learn about each. Tall fescue can be one of three types: Endophyte free, Novel Endophyte infected or Toxic Endophyte infected. For your reference, the endophyte status of each variety is listed in the [2019 Tall Fescue and Bromegrass Report](#).

First, a bit of background on tall fescue. The endophyte is an internal fungus that was present in the original seed that was sown across most of Kentucky in the 1950s and 60s. This fungus interacts with the host tall fescue plant to produce many unique compounds, some that actually make the plant more drought and insect tolerant. But as the name ‘toxic endophyte’ suggests, some of these compounds are detrimental to livestock, especially pregnant mares.

Toxic endophyte tall fescue may also be called “KY31,” “KY31+” or wild type tall fescue. As stated previously, this combination of plant and toxic endophyte is problematic for livestock. In general, for horses, late term broodmares are those most impacted and can experience prolonged gestation, foaling difficulties and low milk production when grazing toxic endophyte tall fescue. Early term mares can occasionally experience early term pregnancy loss. Generally speaking, stallions, geldings, growing horses and performance horses are not negatively affected by toxic endophyte tall fescue, although some physiological effects have been documented. If you do not have broodmares, you likely can tolerate this type of grass in your pastures. However, if you decide to kill out a pasture completely, go ahead and remove this from your mixture.



Traditional stands of KY31 have survived for decades, even under heavy grazing pressure, because of the presence of the toxic endophyte. However, generic KY31 seed is not monitored by either seed improvement agencies or commercial companies to ensure that the seed in the bag is actually the original KY31 genetics. Tests of generic KY 31 seed lots have found that the actual endophyte level varies considerably, and can be quite low (as low at 30%). Essentially this means that instead of getting the persistent (and toxic) tall fescue, you are actually buying endophyte free tall fescue. For this reason, if you do decide to purchase KY31 for its longevity benefits, be sure it is tested for infection before planting.

FIGURE 2. NOVEL TALL FESCUES ARE AS COMPETITIVE AND GRAZING TOLERANT AS THE COMMON TOXIC TYPE, BUT AS SAFE FOR LIVESTOCK AS THE ENDOPHYTE FREE TYPE, AND THEREFORE THE IDEAL TYPE OF TALL FESCUE TO PLANT ON HORSE FARMS.

Endophyte free tall fescue was once a big deal, providing farm managers with the option to purchase tall fescue that was safe for all classes of livestock. But years later, that positive effect of the endophyte on the plant is painfully evident, as endophyte free stands rarely survive more than four to five years. Endophyte free varieties are safe for grazing, but do not have the longevity and typically will not survive long. For this reason, endophyte free varieties are not recommended.

Novel endophyte tall fescue is really the best of both worlds of persistence and lack of toxicity. This type of tall fescue contains a different endophyte, selected to give added persistence over endophyte free tall fescue but with none of the animal problems of toxic tall fescue. It may also be called a “friendly endophyte or beneficial endophyte.” The endophytes in these products were hand selected and the resulting varieties were rigorously tested for quality and safety to livestock before release. Some of this work has been done at UK, including grazing trials with pregnant mares. Because these products have had extensive research, development and testing, they are not cheap. But, if you are killing out and re-establishing a pasture, Novel endophyte tall fescue is absolutely the way to go and worth the added expense.

To ensure you are purchasing a tested and safe novel endophyte tall fescue, consider only those that have been certified by the Alliance for Grassland Renewal. This organization is a nonprofit collaboration of research institutions, seed companies and universities from across the southeastern U.S., including UK. If the seed lot meets its rigorous standards for endophyte purity and viability, it will have an additional seed tag or logo printed on the bag indicating it has been certified by the Alliance. You can learn more about the Alliance and novel tall fescue types on its website and by subscribing to its newsletter.



ALLIANCE *for*
GRASSLAND
RENEWAL

This seed lot has been tested and determined to contain at least 70% novel (selected) endophyte and no more than 5% off-type endophyte.
www.grasslandrenewal.org

Summary

Selecting the best varieties for your pastures is a simple way to improve the chances your efforts of pasture renovation are successful for years to come. Just like purchasing proven bloodlines, selecting seed of improved varieties is well worth the investment and highly recommended. For any pasture seeding or renovation, be sure to follow these six steps to increase your chances of seeding success: 1) Apply any needed lime and fertilizer amendments. 2) Use high-quality seed of an improved variety. 3) Plant enough seed at the right time. 4) Use the best seeding method available. 5) Control competition. 6) Allow the immature seedlings to become established before grazing.



Timely Tips

Dr. Les Anderson, Beef Extension Professor, University of Kentucky

Spring-Calving Cow Herd

- Continue supplying a high magnesium mineral until daytime temperatures are consistently above 60 degrees F.
- Improve or maintain body condition (BCS 5) of cows before breeding season starts. If necessary, increase energy intake even on pasture.
- Bulls should have a breeding soundness evaluation (BSE) well before the breeding season (at least 30 days). Contact your local veterinarian to schedule a BSE for your herd sires. They should also receive their annual booster vaccinations and be dewormed. I often get questions regarding deworming and reduced fertility in bulls. Dr. Phil Prater at MSU and I examined this and found no effect of deworming on bull fertility.
- Schedule spring “turn-out” working in late-April or early-May; i.e. at the end of calving season and before the start of breeding season. Consult with your veterinarian about vaccines and health products for your herd.

“Turn-out” working for the cow herd *may* include:

- Prebreeding vaccinations
- Deworming
- Replacing lost identification tags
- Sort cows into breeding groups, if using more than one bull
- Insecticide eartags (best to wait until fly population builds up)

“Turn-out” working of calves may include:

- Vaccinate for IBR-PI3, Clostridial diseases and Pinkeye
 - Dehorn, if needed (can be done with electric dehorner and fly repellent during fly season)
 - Castrate and implant male feeder calves (if not done at birth)
 - Deworm
 - Insecticide eartags
-
- Consider breeding yearling replacement heifers one heat cycle (about 21 days) earlier than cows for “head-start” calving. Mate to known calving-ease bulls.
 - Record identification of all cows and bulls in each breeding group.
 - Begin breeding cows no later than mid-May, especially if they are on high endophyte fescue. Cows should be in good condition so that conception occurs prior to periods of extreme heat.
 - Consider synchronizing estrus in all cows. Exposing late-calving cows and first-calf heifers to a progestin (MGA feed or CIDR device) for 7 days before bull turn out increases pregnancy rates and shortens the next calving season.
 - Choose best pastures for grazing during the breeding season. Select those with the best stand of clover and the lowest level of the fescue endophyte, if known. Keep these pastures vegetative by grazing or clipping. *High quality pastures are important for a successful breeding season.*
 - If using **artificial insemination**:
 - Use an experienced inseminator.
 - Make positive identification of cows and semen used. This will permit accurate records on date bred, return to heat, calving date and sire.
 - Good handling facilities and gentle working of the cows are essential.
 - Choose AI sires that will meet your goals and resist the temptation to get your cows bigger. Using sires with higher accuracy EPDs will reduce risk.
 - Observe breeding pastures often to see if bulls are working. Record cows’ heat dates and then check 18-21 days later, for return to heat.

Fall-Calving Herd

- Contact your veterinarian and pregnancy diagnose the cow herd. If a large animal veterinarian is not available in your area, consider taking blood samples for pregnancy diagnosis. Remove open cows at weaning time.
- Plan marketing program for calves. Consider various options, such as maintaining ownership and backgrounding in a grazing program, or precondition and sell in a CPH-45 feeder calf sale.
- Initiate fly control for the cows when fly population builds up.
- Calves may be weaned anytime now but you can take advantage of the spring grass by leaving them on the cow a while or weaning and grazing.

Stockers

- Keep calves on good pasture and rotate pastures rapidly during periods of lush growth. Manage to keep pastures vegetative for best performance.
- Provide mineral mix with an ionophore.
- Implant as needed.
- Control internal and external parasites.

General

- Harvest hay. *Work around the weather and cut early before plants become too mature. Harvesting forage early is the key to nutritional quality.* Replenish your hay supply!
- Rotate pastures as needed to keep them vegetative.
- Clip pastures to prevent seedhead formation on fescue and to control weeds.
- Seed warm season grasses this month.

Goat Production

Goat Facts

- Goats are referred to as small ruminants because they have a four-chambered stomach (three forestomachs and one true stomach) like sheep and cattle.
- Labor requirement for goats (five hours per doe per year) is higher than for beef cattle.
- Goats do not like to get wet and will seek shelter in the rain.
- Goats like to climb and jump.
- Goats can be contained in properly constructed fences.
- Goats do not herd or flow through handling equipment as well as cattle.
- Goats prefer to browse. They will get on their hind legs to eat.
- Male goats have an offensive odor, especially during the mating season.
- Male goats are very aggressive and can be difficult to manage.
- Goats are seasonal breeders.
- Goats seem to be more susceptible to parasites in grazing situations than cattle.
- The demand for goat meat is almost entirely ethnic or religiously based.
- Goats are just as susceptible to predators as other livestock.
- Most goats (both sexes) are naturally horned.

Body temperature	101.5-103°F
Heart rate	70-80 beats/min
Respiration rate (<i>resting</i>)	12-15 breaths/min
Age at puberty	7-10 months
Length of estrous cycle	18-22 days
Gestation (<i>pregnancy</i>) length	146-155 days
Kidding rate (<i>births per doe</i>)	1-3
Doe death loss (<i>breeding age</i>)	1-6%
Kid death loss (<i>birth through market age</i>)	10-20%
Breeding bucks required	1 per 30 does serviced



Making a Hoop Pen for Pasture Poultry

Steve Skelton, Kentucky State University, Jacquie Jacob and Tony Pescatore, University of Kentucky

Interest in pasture poultry production has been on the rise. This kind of poultry production typically involves housing the birds in a bottomless pen that is placed on pasture and moved at regular intervals. The flock has access to the pasture (plants and any associated insects) while providing them some protection from predators.

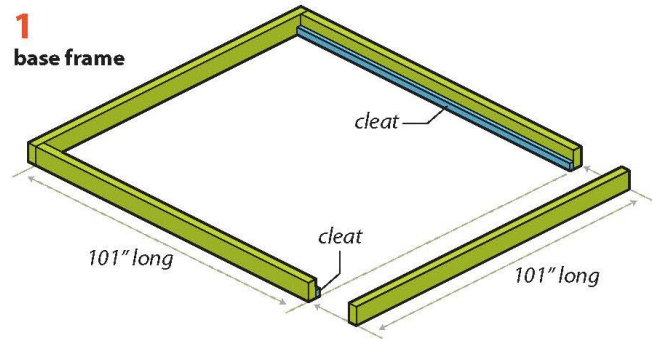
A hoop pen has several advantages:

- **Low cost.** It is a relatively inexpensive option for housing poultry on pasture.
- **Easy to move.** The finished hoop pen is relatively lightweight.
- **Strong.** Despite its light weight, the frame is strong enough to handle daily moving.
- **Allows a person to stand up.** The pen is built with two cattle panels and has a ceiling of about six feet.
- **Provides ventilation options.** The adjustable side curtain allows for different levels of ventilation as required for the changing weather conditions.

Step 1. Base Frame

Consists of: A 2x4 frame (four pieces) and a pair of 1x2 cleats (two pieces). All six pieces are cut to a length of 101 inches. Save offcuts for later use.

- Attach the cleats to two of the base frame members.
- Screw the 2x4s together to form the base frame.



Note: See the back page for a list of materials needed to construct the hoop pen.



Drywall screws are used to attach the cleats.



A couple of deck screws per corner secure the base assembly 2x4s.

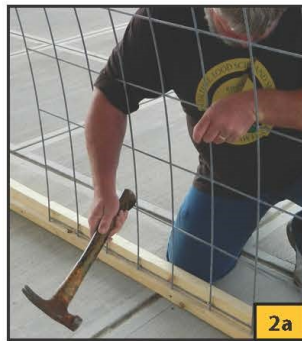
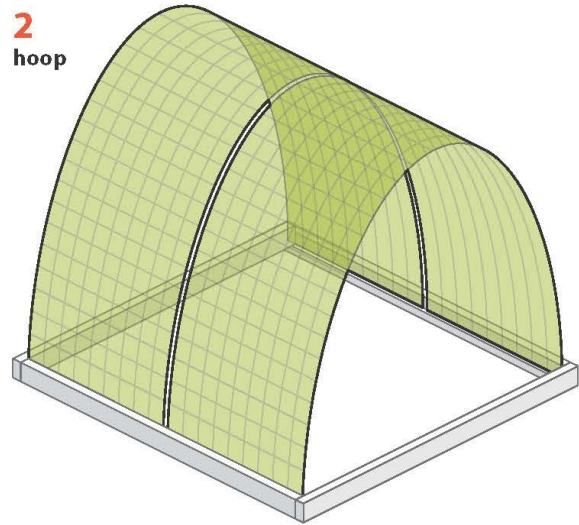
Step 2. Hoop

- Consists of:** Two cattle panels side-by-side, bent to form an arch.
 a. Attach panels to the inside of the base with fence staples.
 b. Connect the panels to each other with hog rings at every joint.



When bent, the 16-foot long cattle panels form a hoop approximately 6 feet in height.

2 hoop



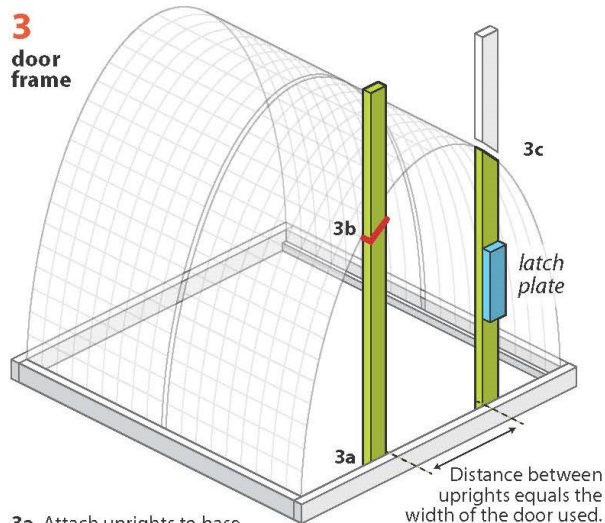
Cattle panels rest on the cleats and are secured with fence staples.



Hog rings tie the panels to each other. **Note:** Panel ribs should face the outside of the pen.

Step 3. Door Frame and Latch Plate

- Consists of:** Two 2x4s that serve as the hinge- and latch-side frame uprights, and a short length of 2x4 for a latch plate.
 a. Attach frames to the inside of the base with screws.
 b. Secure frames to the hoop with fence staples.
 c. Screw the latch plate to the latch-side frame.



- 3a.** Attach uprights to base.
3b. Mark hoop angle on uprights.
3c. Cut uprights, attach to hoop.



Three-inch deck screws secure the frame uprights to the base assembly.



Attach uprights to the hoop with fence staples.

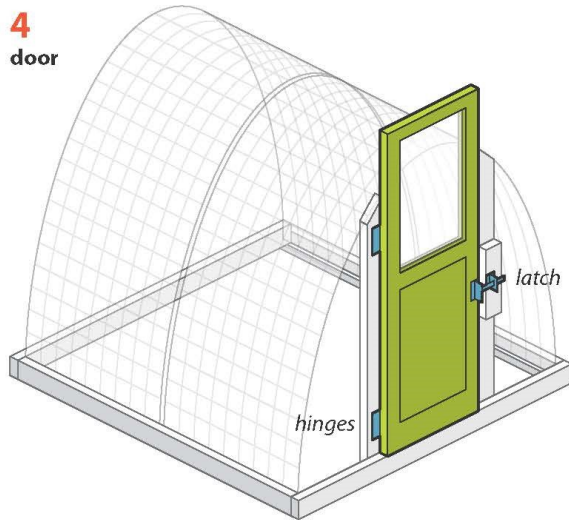
Step 4. Door and Latch

Consists of: An old screen door and a gate latch.

- Face mount the door to the frame with a pair of hinges.
- Install gate latch.

Safety tip: Add a piece of string to the latch, and hang it inside the wire in case the door shuts and locks you in.

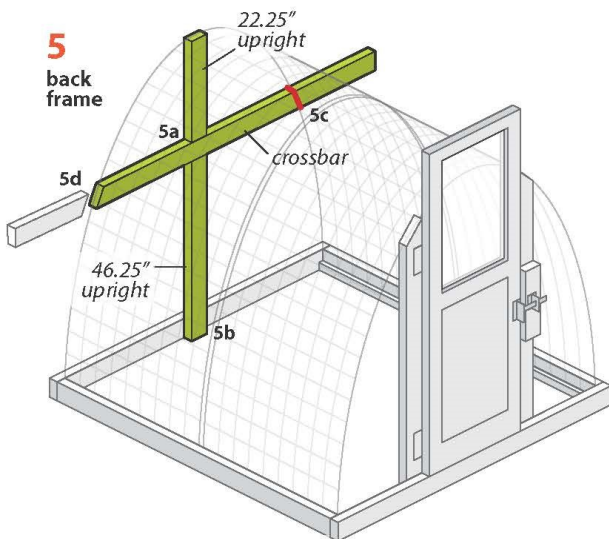
4 door



Step 5. Back Frame

Consists of: Lengths of 2x4s, which support and stiffen the back of the hoop.

- Cut the horizontal crossbar to length, and attach it to the hoop with fence staples.
- Cut the vertical uprights to length and attach.



- 5a.** Attach uprights to crossbar.
5b. Attach lower upright to base.
5c. Mark hoop angles on crossbar.
5d. Cut crossbar, attach frame to hoop.



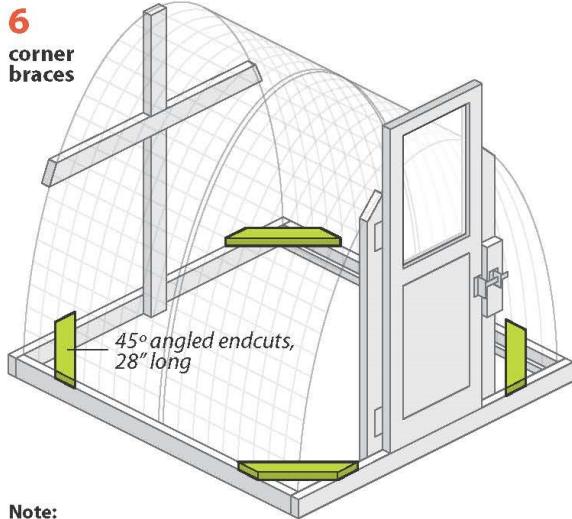
Cut the crossbar to length, and attach it to the hoop with fence staples.



Cut the uprights to length, and secure them to the base, the crossbar, and the hoop.

Step 6. Corner Braces

Consists of: Lengths of 2x4s (four pieces), used to strengthen the base and as the point of attachment for the pull rope.



Note:
Dimensions in this figure are approximate.



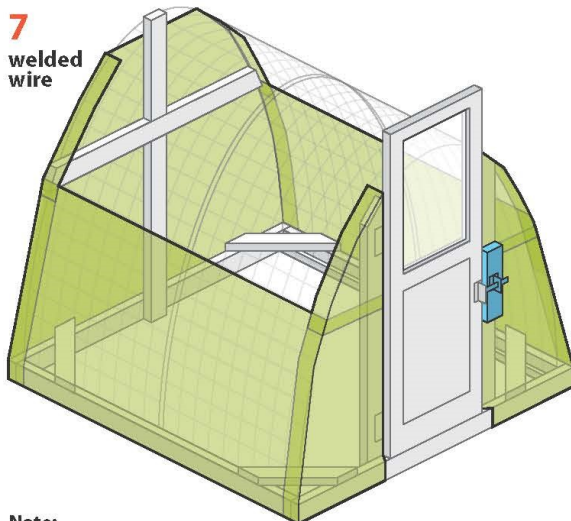
Corner braces cut to a length of 28 inches should be just about the right length for attaching through the third opening in the cattle panel.

Step 7. Welded Wire

Consists of: Rolled welded wire, used to exclude predators.

- Apply wire to the outside of the hoop, rib side out.
- Attach to hoop with hog rings, wire, or plastic ties.
- Screw wire to the base using the fender washers, angling the screws down so the wire tightens as the screw is tightened.
- Attach to the back frame in the same manner.
- Overlap the ends and add additional wire as needed to fully cover any gaps.

Note: For areas with heavy predation, it might be necessary to cover the entire frame with welded wire.



Note:
Remove latch plate before installing the welded wire, then reattach.



7b



7c



7d

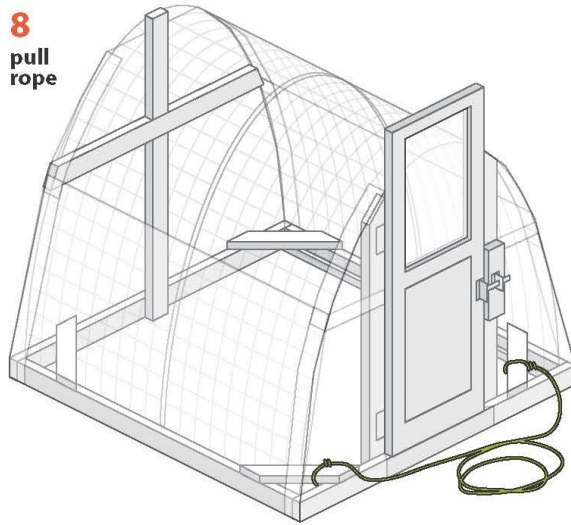


7e

Step 8. Pull Rope

Tie the ends of a rope to the front two corner braces.

8
pull
rope



Step 9. Nest Boxes and Perches (optional)

It is best to add nest boxes and perches now, although they can be added later if needed.



Nest boxes can be hung from the crossbar.



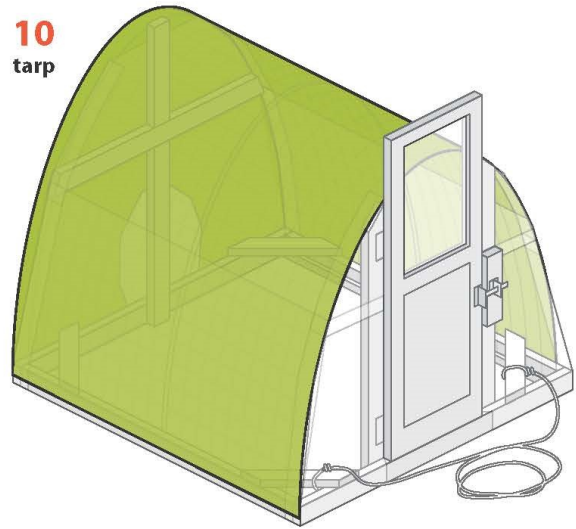
The perches are made from branches screwed to two 2x4s and attached to the cattle panels at the desired angle. In the up position, necessary for moving the pen from place to place (above), and in the down position (below).



Step 10. Cover Hoop with Tarp

- Place the tarp over the cattle panel, and screw one side to the bottom frame using fender washers and drywall screws. Continue screwing the bottom of the tarp to the bottom frame at the back.
- Tie the front of the tarp to the cattle panels using straps.
- Tie one end of the nylon strap to the wire.
- Run the remaining length of nylon strap through the holes at the back of the tarp.
- Partially screw a drywall screw and washer on the bottom on the other side of the back brace.
- Loop the strap over this drywall screw and washer.
- Tie the ends of the strap together.

Modifications: You can use flexible plastic roofing to make the pen more permanent. However, this modification will limit ventilation possibilities.



Feeders and waterers can be hung from the cattle panels. It is possible to suspend a bucket of water on the front panel. This bucket would supply water to an automatic bell drinker. Similarly, the bucket can be fitted with nipple drinkers and hung in the pen. Nipple drinkers reduce water spillage and can be kept cleaner.

Good Management Practices

Hoop pens work well in a pasture-poultry management system, but some important things should be kept in mind to use the hoop pens successfully.

Use the hoop pen on well-drained pastures. Poultry are tolerant of a wide range of environmental temperatures, including winter temperatures, as long as they are protected from the wind. Poultry cannot, however, tolerate cold temperatures when they are wet. To prevent the birds from getting wet, make sure the hoop pens are placed on well-drained pastures. Wet pastures also increase the likelihood of problems with internal parasites.

Place the hoop pen so wind and rain are not entering. You also need to orient your pens so the open end is not facing into bad weather. In cold weather it is important to provide the flock protection from the wind.

Age appropriate placement on pasture. The weather also will determine when you can place your birds on pasture. Young chicks are not able to maintain their own body temperature of 107°F. As a result they need supplemental heat for the first three weeks. That typically makes it harder to put young birds on pasture until after at least three weeks of age.

Do not overcrowd you birds. Hoop pens can be used for a variety of poultry. The number of birds they can hold varies with the size of the birds being raised. You can comfortably house about 50 broiler chickens to market age or 20 layers. With 20 hens, you will need at least four nest boxes—one box for every five hens. The number of turkeys you can house in a hoop pen will vary with the type of turkey. Because of their bigger size, you could only comfortably house about 10 turkeys in a single hoop pen.

Make sure the birds have fresh, clean water at all times. Make sure your birds have fresh, clean water every day. Birds can live longer without food than they can without water. You can have a reservoir of water on the outside of the pen feeding a bucket with nipple drinkers on the inside. If using nipple drinkers you need to provide one nipple for every 10 birds. If housing 20 layers you need at least two nipples, although three would be better. With layers, therefore, one bucket with two or three nipple drinkers is sufficient. If you have 50 broilers you will need five nipple drinkers, preferably two buckets of two to three nipples each. If using bell drinkers, you should follow the manufacturer's specifications.

Make sure the feed does not get wet. Wet feed can become moldy feed rather quickly. Molds can produce mycotoxins, which remain even if the moldy parts are removed. Mycotoxins adversely affect the health and performance of the flock. Hang the feeders away from the front opening of the tarp so that it is more protected from the rain.

Adjust the height of the feed and water as the birds get older. The height of the drinkers should be adjusted to accommodate the height of the birds. Nipple height should be adjusted as often as needed. As a general rule for broilers, the height must be adjusted at least every other day for the first two weeks of the flock and daily from that time on. The bottom of the triggering pin should be at eye level of day-old chicks. Nipples should be raised gradually so that birds must reach up and stretch slightly to activate the nipples from five days onward. Bell drinkers should be at the height of the back of the birds.

Similarly, the height of the feeder needs to be adjusted as the birds get older. If using a tube feeder you need one tube feeder for every 25 chickens. For a flock of 20 laying hens, you need one feeder. For a broiler flock of 50 chicks, you would need two. The height of the lip of the feeder should be at the height of the back of the chicken, making the feed accessible without having the birds waste feed.

Adjust the coverage of the tarp as required for the daily weather conditions. Ventilation needs to be increased during hot weather and reduced during the colder temperatures.

Move the hoop pen frequently. It is important the birds be placed on fresh pasture and the manure not be allowed to buildup. When the chicks are small, that movement can be every other day but quickly increases to every day and, for older broilers, perhaps twice a day. Laying hens should be moved daily.

Use proper pasture management. Whatever you choose as your pasture crop it needs to be managed properly. The chickens should not be placed on pasture when the forage is long and tough. If allowed to grow too long, the material is not effectively used by the flock and instead is just trampled down. Pasture should be allowed to recover before being used a second or third time in a single growing season. The recovery time will depend on the type of bird, the flock size, and how long they were left on a single piece of pasture.

Keeping these points in mind when using this type of hoop pen will help you raise a successful pasture poultry flock. For more information on poultry production, including pasture poultry, check out the www.eXtension.org Web site.

Equipment required:

- Hammer
- Electric screwdriver
- Electric handheld saw
- Wire cutters (side dykes)
- Pliers for hog rings
- Tape measure
- Pencil

Materials required:	Size	Quantity	2012 Prices	Total
<i>Wood</i>				
2" x 4"	10' long	4	\$3.60	\$14.40
	8' long	4	\$2.40	\$9.60
1" x 2" furring strips	10' long	2	\$3.50	\$7.00
<i>Hardware</i>				
Hog rings	—	1 box	\$2.70	\$2.70
Deck screws	3"	1 lb.	\$8.70	\$8.70
Drywall screws	1½"	1 lb.	\$8.70	\$8.70
Fender washers	1"	1 lb.	\$4.50	\$4.50
Fence staples	1" x 1½"	1 lb.	\$3.75	\$3.75
Gate latch	—	1	\$4.00	\$4.00
Door strap hinges	—	2	\$2.70	\$5.40
<i>Other</i>				
1" x 2" 14-gauge welded wire	48" high	30'	\$1.25/ft.	\$37.50
Cattle panels	16' x 50"	2	\$20.00	\$40.00
Tarp	12' x 16'	1	\$23.50	\$23.50
Nylon rope	—	20'	\$0.80/ft.	\$16.00
Tie-down straps	—	—	\$3.85	\$3.85
Old door	—	—	\$8.00	\$8.00
Total				\$197.60 plus tax



Hog rings



3" deck screws



1½-inch drywall screws



Fence staples



Hinges



Latch



Cattle panel



Fender washers



1" x 2" 14-gauge welded wire



Nylon rope

“This plan also makes an inexpensive greenhouse—Just add clear plastic instead of tarp”.

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Get Your Home Garden off to a Good Start

Source: Rachel Rudolph, UK horticulture extension specialist

Springtime in Kentucky is the perfect time to get outside and start your home garden. A few tasks will help you have a successful season.

Planning your garden on paper before you begin allows you to visualize the plants you want to grow and when they will be ready to harvest.

Next, select a good gardening site. Plan a site in full sun, relatively level, well-drained, close to a water source and dries quickly from morning dew. You may need to get a soil test to best prepare the soil. Add fertilizer according to soil test results.

Remember to only plan a garden as large as you can easily maintain. Beginning gardeners often overplant and fail because they can't keep up with the required tasks. You must manage weeds and pests and apply water so your plants will be ready to harvest on time.

A few other important tips:

1. Grow vegetables that will produce the maximum amount of food in your available space.
2. Plant during the correct season for the crop.
3. Choose varieties recommended for Kentucky.
4. Harvest vegetables at their proper stage of maturity. Consider how you will store them if you don't use them right away.

Consult the University of Kentucky College of Agriculture, Food and Environment's Home Vegetable Gardening publication ID-128, available online at <http://www2.ca.uky.edu/agcomm/pubs/id/id128/id128.pdf>.

Raised Bed Gardening

Raised bed gardening has several advantages.

- You, the gardener, have control over the planting media. You can create your own amended soil or soilless mix to use in your raised bed. This allows for gardening in areas with poor soil quality, including rocky shallow soils, poorly drained soils, and soils with steep slopes.
- Better root growth from amending native soils or utilizing soilless mixes typically results in higher yields from plants grown in raised beds.
- Raised beds require less stooping during weeding and watering, making gardening easier for those with limited mobility.
- Raised beds allow for more efficient planting, since plants are not placed in traditional rows.

Planting Media

Container and raised bed gardening allow the grower to control the planting media through soil replacement or soil amendment. The decision for each will likely be determined by your budget. In a few small containers, it is a relatively low cost to purchase a prepared potting mix (soilless mix) available at local garden centers or greenhouses. However, purchasing a large volume of prepared soilless mix for multiple containers or raised beds might be cost prohibitive. An alternative to purchasing a prepared potting mix for a large raised bed would be to mix your own soilless mix or amend a native soil with organic additives.

Soilless Mixes

Because native soil can become compacted and impermeable to water and thus deprive plant roots of moisture and air, soilless mixes are often used in place of native soil in containers or small pots. Soilless mixes are synthetic blends of natural materials designed to provide the fundamental requirements of plants: air, water, and nutrient retention. Most soilless mixes have some of the following components.

Peat moss.

An organic product mined from wetlands in cold wet climates, peat moss consists of decomposed moss in the absence of oxygen, which slows decomposition. The natural processes involved in forming peat take hundreds to

thousands of years. This material has a high moisture-holding capacity, low compaction, and a high plant nutrient retention capacity. Peat has a low pH (3.5–4.0) and requires addition of lime for most crops. Used in moderation, peat is considered by some as a renewable resource; however, its regrowth rate is slow at 1 mm per year.

Coir pith

Coir is the fibrous outer husk of a coconut that is used to make rope and mats. A byproduct of the fiber stripping process, the pulp surrounding the fiber has been used as a media for plant growth since the mid-1980s. Coir is considered a renewable resource and has properties similar to peat. Like peat, coir has a high moisture-holding capacity, low compaction, and a high plant nutrient retention capacity. However, coir has a higher pH (5.5 – 6.5), a higher soluble salt content, and is easier to wet relative to peat.

Compost

Compost is a combination of decomposed organic materials (e.g., fruit and vegetable waste, herbivore manure, leaves, and yard waste). It often displaces peat or coir in mixes. Typically, very little compost that contains manure is used in potting soil, unless specifically labeled, due to odor. Compost adds nutrients to the mixture, so it is important to test your mix prior to fertilizer application for nutrient availability to avoid excess nutrients leaching into the environment from your garden. Ideally the carbon to nitrogen ratio (C:N) of mature compost is less than 30:1.

Wood products

In some mixes, products from the timber industry are used as replacements for peat or coir. Usually ground and partially composted, wood products provide ample aeration but dry out faster than peat or coir.

Perlite

Perlite is a silica-based volcanic rock (volcanic glass) that has been rapidly heated to expand several times its natural size, causing it to become porous. Heating causes openings and cracks that provide air- and waterholding capacity for the material. It is lightweight, improves water retention and air circulation, and resembles small popcorn.

Table 1. Cost comparison of material to construct the frame of a 4 foot x 4 foot x 12 inch raised bed

Item Description	Cost Per Item (\$)*	Quantity	Adjusted Cost
Pressure Treated Lumber 4' x 4' x 12" Raised Bed			
2" x 12" x 8' Pressure Treated lumber	13.97	2	27.94
4" x 4" x 8' Treated post for corner bracing	8.17	0.5	4.09
Galvanized 1/4" x 3" lag screw	0.63	16	10.08
Galvanized 1/4" flat washer	0.12	16	1.92
TOTAL			44.03
Pressure Treated Lumber 4' x 4' x 12" Raised Bed			
5/4" x 6" x 8' Pressure Treated lumber	5.37	4	21.48
4" x 4" x 8' Treated post for corner bracing	8.17	0.5	4.09
Galvanized 1/4" x 3" lag screw	0.63	32	20.16
Galvanized 1/4" flat washer	0.12	32	3.84
TOTAL			49.57
Composite Decking 4' x 4' x 12" Raised Bed			
1" x 5.5" x 8' composite deck material	17.97	4	71.88
4" x 4" x 8' Treated post for corner bracing	8.17	0.5	4.09
Galvanized 1/4" x 3" lag screw	0.63	32	20.16
Galvanized Steel 1/4" flat washer	0.12	32	3.84
TOTAL			99.97
Cedar Board 4' x 4' x 12" Raised Bed			
1" x 6" x 8' Cedar board	18.57	4	74.28
4" x 4" x 8' Treated post for corner bracing	8.17	0.5	4.09
Galvanized 1/4" x 3" lag screw	0.63	32	20.16
Galvanized Steel 1/4" flat washer	0.12	32	3.84
TOTAL			102.37
Concrete Block 4' x 4' x 12" Raised Bed			
16" x 8" x 8" Concrete block (Hollow for base)	1.35	12	16.20
16" x 8" x 4" Concrete block (Solid for top cap)	1.34	12	16.08
TOTAL			32.28

*Costs obtained September 2016

Vermiculite

Vermiculite is a natural layered silicate mineral that when heated expands several times its natural volume. This mineral improves waterholding capacity, nutrient retention, and porosity. Typically this material makes up to 40 percent of mixes when combined with peat or other high C:N ratio compost. The materials mentioned can be mixed in a variety of proportions and recipes depending on the user needs. Most vegetable crops in containers do best when the majority (up to 75%) of the mix is made up of organic material (peat or coir, and equal or lesser amounts of compost). The remainder is made up of the inorganic components of perlite and/or vermiculite, with addition of lime to adjust to the pH needs of the desired crop. **It is very important to have your soil-less mix tested prior to adding any plant nutrients or pH-altering amendments such as lime.**

Amended Soil

To develop an amended soil suitable for container gardening, mix no more than 25 per-

cent native soil with at least 75 percent organic amendment (peat, coir, or a blend of one of these components with compost). The native soil component will provide the nutrient-holding and buffering capacity necessary for the planting media so inorganic components such as vermiculite and perlite are not needed. Avoid using 75 percent compost, as this amount of compost will contain an excess of nutrients, which can be an environmental hazard. Do not use native soils that have “heavy” texture containing more than 40 percent clay.

The Bed

The planting media in garden beds are usually raised with respect to the surrounding soil surface to a height of at least 6 to 8 inches. A frame to support the soil may be constructed from wood, stone, plastic composite, concrete block or brick, or the gardener may prefer to simply mound the planting media without a rigid structure. The bed size will vary according to the gardener’s needs and the space available. The cost of constructing a raised bed will depend on the type of material used and the size of the bed. Table 1 compares costs of a 4 foot x 4 foot x 12 inch raised bed that is made from pressure treated lumber, plastic composite, cedar board, concrete block, or decorative brick. Beds are typically constructed no more than 4 feet wide since this width allows for an easy reach into the bed from either side. An aisle of 2 to 4 feet is maintained between beds to allow easy access with tools and equipment (such as wheelbarrows, hose reels, chairs or stools, and wheelchairs).

Selecting a Site

Vegetable gardens are most productive when planted in full sun. However, many vegetables will thrive and produce a good crop if they receive 4 to 6 hours of direct sunlight a day. Place your beds in a location where water is readily available since raised beds dry out more quickly and require more frequent watering than conventional gardens. In addition, place the garden away from trees whenever possible so that tree roots do not compete with the vegetables for water and nutrients. It is especially important to keep gardens away from black walnut trees since black walnut trees produce a compound in their roots, shoots, and leaves that is toxic to many plants including several vegetables.

Preparing the Planting Media

If the raised beds are 12 or more inches high, filling them with amended soil or soilless mix to the top of the structure is not necessary. A 6- to 8-inch depth of amended soil or soilless mix is adequate for plant growth. However, make sure that the sides of the structure are low enough relative to the planting media surface to prevent shading and allow sunlight to reach the plants. Shading may be especially noticeable in fall and spring. If the raised beds are high (> 24 inches) you might consider adding a large uncomposted organic component in the bottom of the bed. Before adding amended soil or soilless mix, up to two thirds of the raised bed height could be filled with the leaves, straw, grass clippings, newspaper, or wood chips (or a mixture of these components). Use a layer of grass clippings or some other compostable organic layer to separate the blended mixture of native soil and organic amendments from the bottom two thirds of raw organic material. The bottom two thirds of the raised bed will compost within a few growing seasons and lose volume. That composted organic material could be mixed in and blended with more native soil and/or soilless amendment including an inorganic component (e.g. perlite, vermiculite) as needed to maintain volume. **It is important to have amended soil or soilless mix from the beds tested for nutrient content prior to applying fertilizer or lime to minimize any possibility for nutrient runoff and pollution.** For information about soil testing, see Extension publication Taking Soil Test Samples (AGR-16). The bulletin is available at your county Extension office or online at <http://www2.ca.uky.edu/agc/pubs/agr/agr16/agr16.pdf>.

The following vegetables will grow in an area receiving 4 to 6 hours of direct sunlight a day (however, best yields may be realized in full sun).

<i>Carrots</i>	<i>Lettuce</i>	<i>Radishes</i>
<i>Cauliflower</i>	<i>Onion</i>	<i>Spinach</i>
<i>Swiss chard</i>	<i>Parsley</i>	<i>Winter squash</i>
<i>Cucumber</i>	<i>Peas</i>	

Planting

There are several ways to plant your bed. You may choose to plant in rows within the bed, or simply group similar plants together by harvest time or height. Table 2 provides suggested spacing for commonly planted vegetables in raised beds and/or container gardening. When choosing what to plant, keep in mind that diversity in plants will promote a more stable ecosystem. Plant diversity encourages beneficial insects and microorganisms in the planting area. Adding flowers to your garden will further encourage and increase ecosystem diversity.

For direct seeded plantings it is often better to plant seeds more densely than desired for the final spacing and thin seedlings to the final spacing once plants have established the first few sets of leaves. If heavy disease pressure is anticipated, spacing plants a little further apart may aid air circulation that may help reduce disease. Factors that may increase disease pressure include disease present on plants growing during the previous year, disease susceptible cultivars being planted, or the garden area lacking exposure to morning sun to quickly dry dew and evening rains.

Raised bed gardens are ideal for succession planting. Succession planting allows a garden space to be used throughout the growing season, in spring, summer, and fall. For example, a plant that is harvested in spring is immediately replaced by a seed or transplant to be grown and harvested in summer. Vegetables such as spinach, lettuce, cabbage, and broccoli, grow well in spring and can be planted relatively early (late March or early April). These crops are often harvested by mid-May when summer vegetables, such as tomatoes, beans, peppers, and squash are planted. Some of these crops mature very quickly, allowing the possibility of making two or more plantings in the summer garden. For example, beans planted in mid-May will likely mature by mid-July. A second planting of beans can be made in mid-July to be harvested in mid-September. Many summer vegetables will be finishing by late August to early September, just in time for a planting of fall vegetables (many of the same cool-season crops that were grown in the spring garden). Preparing for three gardening seasons and planting in succession will achieve the most intensive and efficient use of your

garden space. For additional information on when to plant consult Home Vegetable Gardening in Kentucky (ID-128).

Training plants to grow vertically also allows for intensive and efficient gardening. This approach saves space and often results in higher quality produce. Examples include tomatoes and vine crops. Tomatoes can and should be staked or caged to support vertical growth. Vinecrops such as cucumber, squash, and even melons can be trained to a trellis rather than allowed to sprawl across the ground. In the case of squash and melons, both of which have large fruit, individual fruit may need to be held up by a sling of plastic mesh or nylon hose for additional support.

As you plan from year to year, remember to move plants around if your gardening space allows. For example, if you have multiple beds, do not grow tomatoes (and related crops such as potatoes, peppers, and eggplant) in the same bed for more than two or three years. Give the planting media a break from tomatoes (and related crops) for a couple of years by moving them to another bed, growing them in containers, or not growing them at all. This method will prevent pests from building up to high numbers that will eventually impact the performance of your plants. Note Figure 1. An alternative to this crop rotation practice is to remove and replace the soilless or amended soil mix every two to three years when the same crops are being grown in the same space.

Table 1. Suggested final spacing* of commonly planted vegetables in raised beds and containers

Vegetable type	Typical spacing (inches)	Plants per square foot
Radishes Leaf lettuce (quick crop)	2 x 2	36
Carrots Onions (green from seed) Spinach Leaf lettuce Mustard	3 x 3	16
Beets Turnips Garlic Onions (from slips or bulbs) Peas (provide trellis or support)	4 x 4	9
Most herbs (Basil, Cilantro, Dill, Fennel**, Mint**, Parsley*, Oregano**, Thyme) Bok Choy Head Lettuce Chard Beans Garlic Edible Soybean (Edamame) Corn (not recommended in small plantings)	6 x 6	4
Broccoli Cauliflower Kale Collards Cabbage Potatoes Sweet Potatoes Horseradish Summer squash Eggplant (dwarf types) Cucumber (trellised) Okra Peppers	12 x 12	1
Tomatoes Cucumbers (not trellised) Eggplant Pumpkins Rhubarb** Winter squash Cantaloupe Watermelon	18 x 18 to 18 x 24	<1 (actually .33-.44 plants per square ft)

*Biennial but usually grown as an annual

**Perennial, some perennial herbs can be aggressive, such as mint

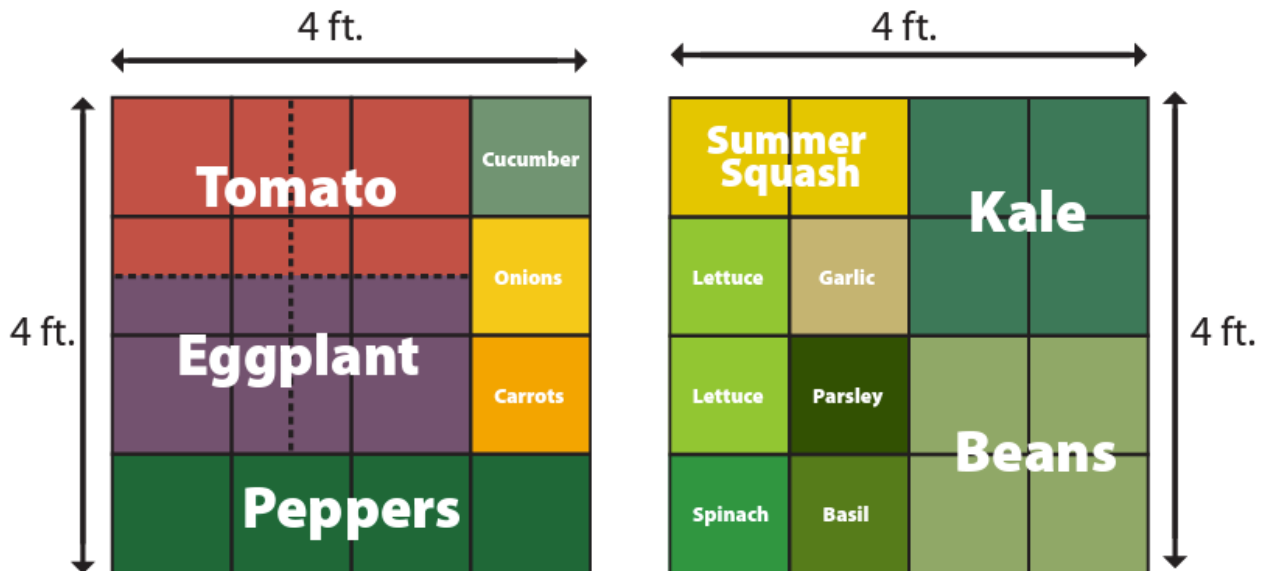


Figure 1. Example of vegetable spacing in a raised bed garden*

* As you plan from year to year, remember to move plants around if possible. In this example, each year the plants grown in the first bed (e.g., tomatoes, eggplant, peppers) can be moved to the second bed and plants grown in the second bed (e.g., summer squash, kale, lettuce) can be moved to first bed to prevent build up of certain pests.

** Early plants are grouped together for crop succession and smaller plants are placed on the outer areas of the garden to avoid shading.

SNAKES: Information for Kentucky Homeowners

Thomas G. Barnes, Extension Wildlife Specialist

Habitat

Snakes like to live in damp, dark, cool places where food is abundant. Likely places around homes to find snakes include:

1. Firewood stacked directly on the ground.
2. Old lumber or junk piles.
3. Gardens and flower beds with heavy mulch.
4. Untrimmed shrubs and shrubs growing next to a foundation.
5. Unmowed and unkept lawns, abandoned lots, and fields with tall vegetation.
6. Pond and stream banks where there is abundant debris or trash.
7. Cluttered basements and attics with a rodent, bird, or bat problem.
8. Feed storage areas in barn hay lofts where rodents may be abundant.



Controlling Snake Problems

No fumigants or poisons are registered for snake control. Various home remedies, including moth balls, sulfur, lime, cayenne pepper, sticky bird repellent, coal tar and creosote, gourd vines, or musk from king snakes, have not proven effective in deterring snakes. There is a snake repellent registered for rattlesnakes and checkered garter snakes. The active ingredients are naphthalene and sulfur. Three field studies have shown it has limited effectiveness for most species. The only efficient method of discouraging snakes is to modify the environment so they find it unattractive.

Habitat Modification

You can modify the environment by removing the snake's shelter (hiding places) and its food source (rodents). Lawns and fields that are kept clean and closely mowed are less attractive to snakes than are areas of tall grass, weeds, brush, and junk. Remove other hiding places such as old boards lying on the ground, rock and junk piles, and trash piles. Trim shrubs and bushes so limbs hang no lower than 12 inches from the ground. Stack wood for your fireplace or stove away from your home on a rack (not on the ground) that sits at least 12 inches from the ground. Cleaning around the yard also removes rodent (favorite snake food) habitat. Other suggestions for reducing a snake's food source include placing garbage in sealed trash cans (not bags) away from the house. If you feed pets outside, keep all dog and cat food cleaned up after each feeding and store feed so it is unavailable to rodents (steel trash can). To summarize, remove rodents, rodent food and shelter, and all objects that create a damp, cool, dark environment preferred by snakes.

Exclusion

Snakes enter buildings in search of cool, damp, dark areas or places where rodents and insects abound. To prevent these unwanted guests from entering your home, check the foundation for cracks and openings 1/4 inch or larger. Use mortar for poured concrete, concrete block, or brick foundations. Use 1/8-inch hardware cloth or sheet metal to seal holes and cracks in wooden buildings. Seal cracks and openings around windows, doors, electrical pipes, and wiring with caulk. If you have an open septic or sump pump drain outside, cover the opening with 1/4-inch hardware cloth. Be sure to check it periodically to ensure that the wire does not interfere with drainage. If you have young children and live in an area where poisonous snakes are common, you may want to invest in a snake-proof fence (Figure 3). Snake-proof fences are expensive to construct, so fencing an entire yard is not practical. However, you can enclose a small area where young children play.

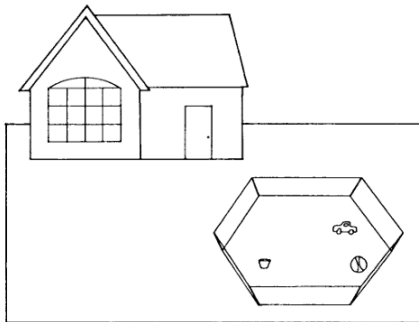


Figure 3. A snake-proof fence can keep snakes from entering a given area.

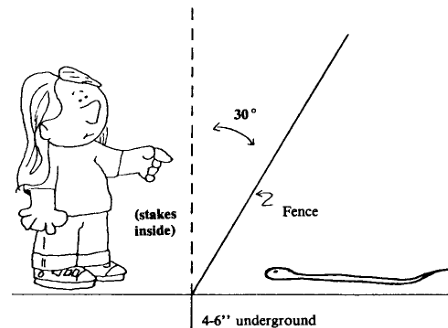


Figure 3a. Side view of a snake-proof fence

Snake-proof fences must be constructed of 1/4-inch hardware cloth at least 36 inches wide. The lower six inches must be buried underground, and the fence should be slanted outward at a 30-degree angle. Supporting stakes need to be placed inside the fence. The fence can be made sturdier by attaching wires from the fence to the stakes. All gates must fit tightly; they should open to the inside because of the outward slope of the fence. Be sure to keep grass and weeds around the fence mowed closely to the ground to prevent snakes from using them to crawl over the fence.

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Farmers Market is now open with “Pop-Ups” each Saturday in May and will Officially open June 3. Then it will be open each Tuesday 4:30 - 7:00 pm and each Saturday from 9:00 am until 1:00 pm.