THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION
Colleges of Agricultural and Environmental Sciences & Family and Consumer Sciences

# Bobwhite Quail Production and Management Guide

*W. A. Dozier, III and K. Bramwell, Extension Poultry Scientists*
*Poultry Science Department*

*J. Hatkin, Laboratory Director*
*Georgia Poultry Laboratory, Camilla, GA*

*Claudia Dunkley, Extension Poultry Scientist*

## Introduction

Each year in Georgia, approximately 5 million Bobwhite quail are produced and marketed for use at hunting preserves and plantations. In addition to many plantations in adjoining southern states, approximately 175 public-use hunting preserves are permitted annually in Georgia by the Department of Natural Resources. The total number of hunting preserves and plantations in the southern region provides an excellent market for Bobwhite quail producers. With recent droughts, volatile market prices and other problems associated with agronomic crops in Georgia, Bobwhite quail production has received attention as an alternative enterprise for many farming operations.

Most successful producers typically take one of two paths: breeding or growout. Breeder producers raise birds with the intent to market the resultant chicks at one day of age to growout producers. Growout producers specialize in raising day-old chicks until they are approximately 17 weeks of age and can be sold as flight-ready birds to game preserve owners. Breeder producers typically sell day-old chicks at $0.30 to 0.35 per bird, whereas flight-ready bird producers market 17-week-old birds at approximately $3.10 to 3.50 per bird. The quality of bird produced and the time of year they are available may greatly influence the price received for flight-ready Bobwhite quail.

This publication describes the factors producers should consider to ensure their breeder and hatchery management practices result in healthy birds and a successful business.

# Breeder and Hatchery Management

### Lighting

Calculate housing needs, feeding schedules, lighting programs and vaccination schedules in reverse from the time the birds are about 22 weeks of age. While young breeders may begin to lay a few eggs as early as 18 weeks of age, do not expect consistent egg production until about 22 weeks of age.

Maintain young chicks and immature birds in a dimly lit environment to reduce cannibalism and to allow uniform sexual development. Immature birds do best on as little as 10 to 11 hours of light per day. At 19 weeks of age, increase the amount of daily light birds receive by an hour a week until they receive 17 hours of light per day (at about 25 to 27 weeks of age).

For birds receiving natural daylight, add the additional hour(s) of light equally at the beginning and end of the natural daylight. For example, when birds require 16 hours of light daily, but the natural daylight and time of year produce 12.5 hours of daylight, breeders will require an additional 3.5 hours of light per day. Use an automatic timer device to turn lights off and on each day. Turn lights on (or set an automatic timer) about two hours before daybreak; set the timer to turn off about 1.5 hours after sunset. Producers who raise birds in total blackout facilities (not exposed to natural day lengths) should have no problem meeting the schedule outlined in Table 1.

To reduce cannibalism, light intensity should not exceed 1 foot candle. Interior walls of the house should be white or light-colored to reflect the light provided and reduce dark spots in the house. After the light has reached 17 hours per day, it is extremely important to maintain this day length. Any sudden decrease in hours of light per day will cause a decline in egg production.

**Table 1.** Lighting requirements for Bobwhite quail at different ages.

| Bird age (weeks) | Hours of light per day |
|---|---|
| 19 | 11 |
| 20 | 12 |
| 21 | 13 |
| 22 | 14 |
| 23 | 15 |
| 24 | 16 |
| 25 | 17 |

### Housing

Maintain breeders in a comfortable, well-ventilated environment. Keep temperatures between 65 and 85 degrees F to achieve acceptable feed conversion and production levels. Research indicates that temperatures lower than 65 degrees F will increase the bird's energy requirement, which will lower feed efficiency and, more importantly, reduce egg production. At temperatures greater than 85 degrees F, feed intake is often reduced, which may also lead to reduced egg production. In contrast to most other domesticated birds, Bobwhite quail often peak in egg production during the warmer portions of their production cycle, possibly suggesting they are more heat tolerant. However, excessively high ambient temperatures often result in reduced fertility in other avian species.

A properly designed and operated negative pressure evaporative cooling system may be profitable. Benefits include a significant increase in egg production, shell quality and fertility during summer and early fall. Regardless of temperatures, ventilation in the breeder facility must be maintained to remove excess dust, ammonia, moisture and potential pathogens. The ventilation system should not subject the birds to a direct draft, although this poses less of a problem in the warm summer months.

Breeders are typically housed in one of three ways: in large community floor pens, in smaller communal cages designed for 10 to 20 birds each, or caged as pairs or trios. Each of these housing types has advantages and drawbacks.

**Floor pens.** Traditional floor pens may be the least desirable type of housing for breeder quail. When birds are housed directly on the floor, collecting eggs is often more difficult and time consuming, which can lead to less frequent egg gathering. Infrequent collection can cause egg loss due to shell damage and contamination, birds consuming eggs, or pre-incubation of the developing embryos. These factors will lead to lower harvested egg numbers, reduced hatchability and poorer chick quality. In addition, there are significantly more dirty eggs from birds housed on the floor. Dirty eggs cause increased egg contamination, which also reduces hatchability and chick quality. Furthermore, with floor-laying flocks, producers cannot identify and cull low- or non-producing birds. Lastly, birds raised and maintained on the floor have increased exposure to parasites or other disease-causing pathogens.

However, modifying floor pen housing can eliminate many of these problems. For example, housing birds in large pens on slatted floors similar to the traditional

floor pen setup has been successful. The house design is the same, but the problems associated with birds raised directly on the litter are eliminated. There is an added expense to cover the majority of the floor with a removable slatted or wire-type floor, but both bird health and eggshell quality often improve. Birds do have a tendency to lay eggs on the slatted floor instead of in the nest boxes, but the eggs do not come in direct contact with fecal material.

***Wire Cages.*** Placing birds in wire cages has several advantages over the traditional floor pen design. Eggshell quality improves and the eggs are much cleaner because they don't come in direct contact with fecal material and roll away from the bird shortly after they are laid. Cleaner eggs increase hatchability and chick quality. In some cases, wire cages allow the use of an automatic egg collection system, which further improves egg quality since the egg gathering process is faster and occurs more regularly. In addition, when new breeding stock is to be produced from the current flock of breeders, the ability to select replacement birds based upon genetics and performance is possible. As mentioned earlier, identifying and removing low- or non-producing birds from the breeding stock is possible with this housing design.

***Colony Cages.*** Experience has shown (for other than hobby operations) that it is most practical and economical to house breeders in colony cages (<36 inches deep) using an in-line flat deck or stair step system. Use nipple, cup or cup-nipple waterers and trough feed breeders. Flooring should be of quality ½-inch x 1-inch welded wire. Eggs from cage breeders will cool more rapidly and be much cleaner than in floor-type situations. Pecking and cannibalism will not be a factor if approximately one-third of the upper beak of hens is removed at housing. Cocks should be lightly block snubbed (hold beak closed and touch end to hot snubbing blade until blocked).

However, placing birds in wire cages has disadvantages that must be considered. Since the birds will spend their entire life on the wire, the bottom of the cages must be smooth and free of sharp points that can cause damage to the bird's feet. Injured and sore feet reduce fertility and mating frequency. In addition, any open wounds increase the chance of infection, disease and death. Greater expense is incurred and additional attention to detail is often required, as each cage must be equipped with a feeder and waterer.

Housing birds in cages with one to two males per cage can reduce average fertility for the entire flock. Communal cages, or cages designed for 10 to 20 birds per cage, will often alleviate this suppressed fertility. Caged birds will require about ½ square foot per bird. Cannibalism is often a bigger problem in smaller cages because birds cannot escape and hide from the more aggressive birds. Lights must be dimmed to about ½-foot candles to reduce aggression and pecking, but lower light levels are not recommended as mating activity may be reduced.

# Incubation

Hatching egg sanitation often determines the quality and quantity of chicks hatched. To optimize the number of clean and viable hatching eggs, collect them three to five times each day. Make the final pickup late in the day to minimize the time eggs spend in the breeder house. This is particularly important during the warmer summer days. The most desirable eggs are those that are clean, free of shell defects, fairly large and with good shell quality.

Embryonic development begins at temperatures at or near 75 degrees F. To stop excessive embryo development and weakening, cool eggs shortly after they are laid. Repeatedly starting and stopping embryo development usually causes poor hatchability due to embryonic mortality.

Store hatching eggs until an appropriate number of eggs are obtained to produce the quantity of chicks desired from a single hatch. Store eggs with the large end up in clean egg flats in an egg room or cooler. Maintain the egg storage room at 55 to 70 degrees F and about 70 to 80 percent relative humidity. Egg storage beyond seven days will reduce hatchability; therefore, the date the eggs were laid should be clearly labeled in pencil marker on the eggs or egg flat.

Many producers pre-warm hatching eggs for several hours prior to setting by removing them from the cool room and allowing them to gradually warm to room temperature. Gradually warming the eggs reduces "sweating," or the condensation of water on the eggshell surface, which enables bacteria on the eggshell surface to multiply and allows motile bacteria to penetrate the eggshell. The pre-warming environment must have a strong airflow so that condensation moisture evaporates as it is formed. Pre-warming, if not properly done, may reduce hatchability and chick quality.

## Factors Affecting Hatchability

For successful incubation, a number of factors must be controlled: temperature, humidity, egg turning, ventilation and sanitation. Temperature, humidity and turning are the

three most critical factors with hatching eggs (Table 2). Bobwhite quail eggs will hatch 23 to 24 days from the time they are set in the incubator. The ideal temperature in a forced-air incubator should be 99.5 degrees F with a relative humidity of approximately 60 percent. Temperature fluctuations may prolong or shorten the exact length of incubation.

**Table 2.** Incubation time and requirements for Bobwhite quail

| Item | Optimum Value |
|---|---|
| Incubation time, days | 23-24 |
| Forced air temperature[A], °F | 99.75 |
| Humidity[B], % | 84-86 |
| Operating temperature last three days of incubation[A], °F | 99 |
| Humidity last three days of incubation[B], % | 90-94 |

[A] All operating temperatures are given in degrees Fahrenheit – Dry Bulb.
[B] Humidity is presented as degrees Fahrenheit – Wet Bulb.

Eggs are generally transferred to a separate hatcher on day 21 of incubation. Using separate setters and hatchers results in cleaner chicks and less cross contamination between the hatching eggs and any newly set eggs. The relative humidity in the hatching machine should be a little higher, at 70 to 75 percent, with a slightly lower temperature of 97 to 99 degrees F. However, the ideal temperature will vary among machine types and hatcher room conditions.

Warm or cool spots in the incubator may cause noticeably prolonged or shortened incubation periods or unusually low hatchability. Place several accurate thermometers in the incubator and check them several times daily. If temperature variations are a problem, contact the incubator manufacturer for suggestions. Severe or prolonged temperature variability in the incubator room may affect conditions in the incubator's interior, especially if the incubator is inadequately insulated. Such variations may adversely affect chick quality.

Incubators have either still or forced-air ventilation. Both types can be successfully used, but forced-air machines provide a more uniform environment for hatching eggs. While developing embryos require oxygen, with an increasing requirement during the latter stages of incubation, it is critical to remove carbon dioxide ($CO_2$) and moisture from the incubator. Forced-air incubators ensure a steady flow of incoming and exhaust air through the machine.

Ventilation in both the incubator and the incubator room are equally important. Do not use a room air conditioner in the incubator room to maintain room temperature and humidity, as they remove moisture from the air and the air going into the incubator will be too dry.

During incubation, eggs require regular turning to prevent the embryo from sticking to the membranes. Mechanical egg turning devices are recommended, and are necessary with large numbers of eggs. If relatively few eggs are being incubated, the eggs can be manually turned and marked with an X on one side to ensure all eggs are turned each time. Turn incubating eggs at least three times per day. Rotating eggs is not necessary during the last third of incubation, but they most continue to be turned until they are moved to the hatching machine. Place eggs on their sides in enclosed baskets in the hatcher.

Candling a sample of eggs after 7 to 10 days of incubation provides valuable information if hatchability problems occur. Remove those eggs lacking a distinct blood vessel network ("clears") and perform a "breakout" of these eggs to determine the cause of failure. Record early embryonic mortality during the egg breakout to help troubleshoot hatchability problems. Patterns of embryo loss will enable identification and separation of fertility, egg handling or incubation problems. Should assistance be needed to distinguish truly infertile eggs from early embryonic deaths, consult a local county Extension agent, University of Georgia poultry Extension specialist or the Georgia Poultry Diagnostic Laboratory.

**Several subtle causes of reduced fertility include:**

- Improper ratio of males to females in the house.
- Leg problems in the males, which reduce mating activity.
- Excess temperatures, which reduce mating activity.
- Improper or inadequate lighting.

Position incubating eggs large end up. Failure to properly position eggs may lead to a variety of deformities, including a fully formed embryo with its head in the small end of the egg. After chicks hatch, leave them in the hatcher until 90 percent are dry, then remove them to the brooder.

To reduce the possibility of eggs exploding in the incubator, be sure not to set cracked or leaking eggs. Eggs explode because of bacterial production of gas within the egg. Exploding eggs shower the incubator's interior with bacteria and mold spores that contaminate the other eggs and may contaminate the embryos within those eggs.

| Table 3. Causes of poor hatchability | |
|---|---|
| **Problem** | **Possible Causes** |
| Early embryonic death | Temperature too high or low, pre-incubation of eggs |
| Embryos dead, 2nd week of incubation | Improper turning, temperature too high or low |
| Air cell too large | Humidity too low |
| Air cell too small | Humidity too high |
| Chicks hatch early | Temperature too high, humidity too low, inaccurate |
| Chicks hatch late | Temperature too low, humidity too high, inaccurate |
| Chicks dead after pipping shell | $CO_2$ content too high, improper turning of eggs |
| Sticky chicks | Humidity too low, temperature too high |

# Bird Management

## Brooding

The brooding period is the first six weeks of the chick's life. This critical period is important for getting the chick off to a good start. It is a basic fact of game bird management that chick quality cannot be improved after hatching, but it certainly can be impaired. Be prepared for chick arrival. Cleaning, disinfecting and quail brooder house setup should be complete several days prior to the chicks' arrival. Regardless of the season, the brooders should run for at least 24 hours before chicks arrive, and the litter temperature should be approximately 95 degrees F.

Chicks have sufficient material in their yolk sac to survive the first two to three days without feed (assuming the temperature is correct), but they do need water. It is important that the chicks find the water source shortly after arrival to prevent dehydration and death. Introduce about 10 percent of the chicks to the water by placing water onto their beaks. These birds will teach the others the location of the water. To help the chicks get a good start, place a vitamin mix in the water.

Chicks have difficulty self-regulating their body temperature the first 10 to 12 days of life. They may lose significant quantities of heat through their feet, which explains the emphasis on maintaining the litter at 95 degrees F. Chilling causes the chicks to huddle, causes premature closure of the yolk sac stalk, and makes the chicks more susceptible to disease. Brooder temperatures must be monitored at chick height – about 2 inches high – because temperatures can vary as much as 5 to 8 degrees F from the ground to 4 or 5 feet above the floor. Reduce brooder temperatures by about 5 degrees per week until reaching 70 degrees F.

Brooding is generally accomplished in circular units about 7 to 8 feet in diameter called "brooder rings" that are commonly made of cardboard or inexpensive sheet metal. The brooder ring keeps the chicks in the vicinity of the heat, water and feed. Chicks will be able to fly over the ring by about nine days of age, so remove the ring at about eight days of age. Stocking density can be as high as 10 birds per square foot during brooding.

Most game bird producers use nipple waterers. Nipple waterers significantly reduce the occurrence of wet litter and are simpler to clean than trough waterers. As a general rule, each nipple will supply water to approximately 15 birds.

## Growout

At six weeks of age, chicks are typically moved from the brooding facility to outside flight pens until 17 weeks of age, when they are marketed to hunting plantations. Flight pens consist of wire or netting supported by 4 x 4 wood posts. They are relatively inexpensive to create, although the actual cost depends on the resources available on the farm. The density of birds placed in a flight pen is estimated at 0.70 birds per square foot. Approximately 20 percent of the total flight pen space should be enclosed for shelter and dry space for feeders and waterers. The disadvantage of flight pens is a high mortality rate, which probably occurs due to exposing quail to a cold, wet environment. Flight pens also create an excellent environment for disease outbreaks such as Bronchitis, Capillaria, Histomonas and Ulcerative Enteritis.

A small percentage of growers (about 10%) raise Bobwhite quail in scaled-down "Broiler Houses" for the entire 17-week production period. Pine shavings are usually placed in the house at a depth of 4 inches. The primary advantage of a quail barn is that the birds are removed from a cold, wet environment. Growers producing quail in an enclosed facility have experienced less than 5 percent flock mortality – a reduction that can help offset the increased building cost associated with a quail barn.

Additional advantages of quail barns include a lower incidence of cannibalism and reduced feed cost. From five to 14 weeks of age, birds are grown in the dark to prevent cannibalism. Light stimulates bird activity; thus, less cannibalism occurs with birds grown in dark-out housing. However, dim light should be provided to the birds at

14 weeks to stimulate feed consumption so that they will have adequate energy reserves for flying when marketed at 17 weeks of age. Another advantage of raising quail in barns is that feed consumption may be decreased about 25 percent compared with flight pens, likely as a result of reduced temperature variation (which can fluctuate up to 40 degrees F in outdoor flight pens). During cold temperatures, birds consume additional feed to compensate for lower ambient temperatures.

## Disease Prevention, Sanitation and Biosecurity

One of the biggest challenges Bobwhite quail producers face is preventing disease outbreaks. A disease outbreak can result in flock mortality as high as 50 to 90 percent, which can have a negative impact on a grower's economic bottom line. Unlike commercial poultry, only a few medications are approved for Bobwhite quail; therefore, producers must identify a preventive management plan to minimize disease outbreaks.

### Common Diseases

The three most common diseases that occur with Bobwhite quail production are Quail Bronchitis, Ulcerative Enteritis and Quail Pox; however, other diseases (Myoplasma, Botulism, Coccidiosis, and Capillaria worms) have also been problematic with quail. A brief description of prevention and clinical signs of Quail Bronchitis, Ulcerative Enteritis and Quail Pox is presented below. If additional information is needed regarding other diseases, contact your local veterinarian or an Extension poultry scientist.

**Quail Bronchitis (QB)** is caused by an adenovirus. Transmission is both vertical (through the egg) and horizontal (from bird to bird). Scientific evidence indicates QB may be introduced by wild birds. Morbidity approaches 100 percent and mortality is frequently 50 percent or higher. Once into a flock, QB spreads rapidly through a pen and from pen to pen. Generally, quail less than four weeks of age are severely affected. Birds over eight weeks old may have a sub-clinical infection. Recovered or sub-clinically infected birds may be shedders of the virus. Clinical signs include increased mortality, depressed appetite and rattling respiration. Necropsy reveals white mucous fluid throughout the body. There is no treatment for QB. The best course of action is good management. Increase the temperature several degrees to prevent huddling and possible suffocation. Add a vitamin/mineral pack to the water. Practice good biosecurity to minimize the chances of getting QB. Recovered birds may be kept until the following year and used for breeders; typically, they will pass antibodies through the egg to the embryo.

**Ulcerative Enteritis (UE)** is probably the most common disease observed in quail. UE also occurs in young turkeys, grouse, pheasant and other game birds. The causative agent is a gram-positive bacterium known as *Clostridium colinum*. Clinically, birds diagnosed with UE lose body condition rapidly and become dehydrated and emaciated. Birds may sit with their heads drawn back and their backs humped. The breast becomes thin, shriveled and dehydrated, and has a razor-like edge. Lesions are found in the lower small intestine, cecal pouches and large intestine. Deep ulcers are visible through the unopened intestinal wall. Wear disposable shoes, garments and gloves should you visit another farm.

**Quail Pox (also called Fowl Pox)** is a slow-spreading viral disease of approximately 60 avian species. It gains entry to the non-feathered areas of the skin through minor abrasions or mosquitoes, and also enters via litter ingestion, minor abrasions to the upper digestive tract, and possibly by swallowing infected tears. Quail Pox occurs most frequently during the fall and winter months. Lesions are characterized as a raised, blanched nodule that enlarges, turns yellow and progresses to form a thick dark scab. Although no specific treatment for Quail Pox exists, Quail Pox vaccine is recommended. Vaccination is performed in the wing web, typically at five to eight weeks of age, using a small twin-pronged fork supplied with the vaccine. Birds of any age may be vaccinated. While vaccinating, keep the vial of vaccine in an ice bath. Vaccine not used within 4 hours of reconstitution at ambient temperatures of 50 to 70 degrees F should be discarded. The vaccine cannot be stored in the refrigerator for later use. Under normal circumstances, vaccination confers lifetime immunity.

In addition to vaccinating, adopt environmentally friendly biosecurity and mosquito control methods such as emptying buckets of standing water, mowing around game bird pens, encouraging purple martins to nest in the area and using electrocution lamps.

### Sanitation and Biosecurity

Implementing sanitation and biosecurity procedures is an inexpensive way to reduce the possibility of a disease outbreak. Biosecurity includes measures that prevent the entry and survival of viruses, bacteria, parasites, fungi, insects, rodents, etc., into a game bird flock. Any of these agents may endanger the health of a flock, regardless of age.

Biosecurity should begin with planning the game bird farm. For example, consider placing propane gas tanks near the front of the facility so propane gas service personnel will only have to come into contact with the gas tank. Consider the farm's location and proximity to any other poultry or game bird farms. Are other farms upwind or downwind? Can the farm be situated in a reasonably isolated location? This is known as "conceptual biosecurity." Unfortunately, for a variety of reasons, few producers initiate biosecurity so early in a flock's lifetime. For most producers, disease prevention begins when a flock is purchased. When this is the case, purchase chicks from a reputable hatchery that has been tested and is free of diseases.

Ideally, only birds of a single age and species will be present on the premises at any given time. Some diseases are carried by certain species without apparent effects, but the same organism in a different species can do considerable damage. A good example is the protozoan *Histomonas*, which causes blackhead. Chickens carry *Histomonas*, generally without any visible signs, and pass *Histomonas* cysts in their feces. Bobwhite quail that ingest feces containing the protozoan may become ill with blackhead.

In reality, most producers have game birds of a variety of ages. When feeding, cleaning, etc., start with the youngest birds and finish with the oldest birds, if possible. Separate feeders and waterers should be available for each age group. Clean feeders when they appear dirty. Do not move the feeders, waterers or any other piece of equipment from an older to a younger group without cleaning and disinfecting it first.

Many quail producers now use nipple waterers. Those who continue to use bell-type or inverted Mason jar waterers should clean them out at least twice weekly during cooler weather and more frequently in the warmer seasons. Manure should be removed from waterers and feeders before they are disinfected. It is a good idea to have on hand at least twice the number of waterers required for the flock. This enables the flock owner to disinfect waterers by soaking them in dilute chlorine bleach (1:10) for 30 to 60 minutes, rinsing them, and allowing the chlorine odor to dissipate overnight. Alternatively, the water supply may be chlorinated. Chlorine levels at the point of consumption should approximate 1 ppm.

If you maintain different species on the same premises, confine each species to a specific area. When constructing pens, pay attention to the drainage. Drainage of fecal or toxic material may cause problems. To prevent a buildup of parasite eggs in the pens, salt the ground at the rate of 60 pounds per 1,000 square feet. Wet the ground thoroughly after applying the salt, and till the salt into the ground to a depth of several inches.

Maintain chicks in isolation from older birds. It is a good idea to wear disposable plastic overshoes between pens. Make sure the plastic is sufficiently thick to prevent tearing. Personnel who tend to chicks should change clothes and pay close attention to hand and boot washing should they find it necessary to go from older to younger birds. Do the utmost to prevent the transfer of manure from older to younger birds. Manure contains oocytes or ova of many parasitic diseases. Prevent free roaming, migratory and water birds from accessing your property and birds, as these outside birds are potential disease carriers. Non-caretakers and other bird owners should also be denied access to your flocks.

Place feed and water containers to minimize fecal contamination. A simple method to prevent birds gaining access to feces is to construct a small pit near the feed. Attach ¼-inch hardware cloth to boards. Wire should be free of any sharp protrusions so birds do not damage themselves. Pull the wire taut prior to securing it to the boards. Position cinder blocks so that the wire structure may be positioned over the blocks for security and firmness.

Introduce into your best management practices a system where vehicle and equipment brought onto the farm are cleaned and disinfected prior to entering the property. It is also important to know the signs of infectious bird diseases.

### Rodent Control

Rodent control is an integral part of biosecurity. Not only will rodents destroy and contaminate feed, they may attack and panic the birds and/or destroy wiring and introduce diseases, especially *Salmonella, Leptospira,* coccidian and other parasitic diseases. Rodents may be effectively controlled by a variety of measures.

First, plug all holes they may use to gain entry. Eliminate nesting and hiding areas by removing any rubbish and unnecessary equipment from around the facility. Rodents prefer cover; keep the lawn mowed within at least 50 feet of the facility. Rodent-proof the feed bins and keep spilled feed to a minimum. Establish a baiting program. Baiting programs require some knowledge of rodent habits to be effective, and are most effective when alternate sources of feed are eliminated or minimized, thereby forcing the rodents to eat the bait.

# Summary

Bobwhite quail production can be a viable enterprise if birds are managed properly.

It is recommended that quail producers raise either hatching egg chicks or growout quail (from hatching until 17 weeks of age). Avoid producing both at the same time.

For growers starting out in the business, we strongly recommend that you learn how to grow birds before producing hatching eggs because of the additional management and investment required with breeder production.

Have biosecurity measures in place when you begin your planning and construction.

Learning for Life



**Bulletin 1215** **January 2010**