

TITLE: EVALUATING THE EFFECT OF BROADCASTING A PROTEIN SUPPLEMENTAL FEED ON PRIMARY PREY SPECIES AND NORTHERN BOBWHITE NEST SUCCESS AND CHICK SURVIVAL



The Quail-Tech Experimental Protein Supplemental Feed Mix Spread into the Habitat for Bobwhites During Late-Winter 2016.

Project Summary: The Quail-Tech Alliance has been testing the use of supplemental feed in Texas with experiments (feed vs no feed) that evaluate the influence of supplemental feed on wild bobwhite survival and reproduction in the field on a large scale since 2010. Broadcasting grain sorghum at a rate of 300 pounds per mile every two weeks benefits both bobwhite survival and reproduction. These benefits to bobwhite demographics occur because of decreased exposure to predation, increased nutritional condition, and indirect supplemental feeding of primary prey species such as cotton rats. Though we have completed our studies concerning broadcasting sorghum and have proven its benefits for bobwhites, sorghum is a relatively high energy low protein food. Energy is generally limited in ecosystems during winter. However, protein is more limiting in ecosystems during the reproductive season. Growth of reproductive organs, eggs, and embryos is limited by protein availability. Multiple studies indicate that protein supplementation can increase the clutch size, egg size, and chick size above energy supplementation alone, for a variety of wild bird

species. There are periods in the life of bobwhites (i.e. molting, egg laying) when a more protein rich food would be beneficial, but when quality food sources in the environment are very limited. The late-winter to early spring is one such period where protein rich foods are limiting in the environment in the Rolling Plains of Texas. The limited availability of protein in the diet of bobwhites during late winter and spring suggests providing supplemental protein might increase bobwhite clutch size and egg size. Larger eggs produce larger chicks. Many studies indicate that the probability of chick survival increases as chicks hatch at a larger size, because they are more able to travel, thermoregulate, and have a larger yolk size. We have developed a high-protein moisture resistant ration for bobwhites and proven that they will use it in field tests. We now need to test the diet in large-scale feeding trials like our supplemental feeding experiments with sorghum. Additionally, this protein feed should increase density of cotton rat populations, helping to reduce the predation pressure on bobwhites. Consequently our objectives are to 1) experimentally determine if broadcasting a protein supplement during late-winter, spring, and summer can increase bobwhite nest success, clutch size, chick survival, and population density, 2) determine if this same broadcast protein supplement treatment can increase cotton rat abundance, and 3) examine the relationship between cotton rat abundance and bobwhite demographics. We will be conducting these experiments during late winter and spring 2020.

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A game camera captures a photograph of a bobwhite covey eating the experimental feed mix following a snow storm during December 2015. The feed mix was spread using an ATV-mounted spreader.



Figure 1. A bobwhite's crop full of our water-resistant experimental feed mix which is composed of a combination of high protein pellets and sorghum. The feed mix was broadcast into the vegetation and readily used by bobwhites.



Figure 2. A bobwhite's crop full of pigweed seeds and green vegetation. This bird was killed on the same day in February 2016 as the bird in Figure 1. Though the birds were in similar habitats this bird did not have access to the experimental feed mix.