

Competitive Research Grant Program

Environmental effects on deer antler production in three regions of Mississippi

Investigators: Steve Demarais, Wildlife and Fisheries; Larry Castle, Mississippi Department of Wildlife, Fisheries, and Parks

Project Goal:

To improve deer management efficiency by quantifying the effects of regional variation in soil and nutritional quality on physical development.

Project Objectives:

1. Compare among the three regions the body and antler growth of first generation male fawns (produced by wild-caught dams) raised on optimum nutrition through 3 years of age.
2. Compare among the three regions, the body and antler growth of second generation male fawns (produced by females that were raised under optimum nutrition bred to males from the same region), raised on optimum nutrition through 3 years of age.

Synopsis of research activities per objective:

1. Preliminary results for first-generation bucks show the distinct regional pattern in body mass present in harvest data. Body mass differs among the soil regions at 1½ and 2½ years of age with a 32 pound difference between Delta and Lower Coastal Plain bucks at 2½ years. However, antler size as measured by Boone and Crockett scores was similar among regions at 1½ and 2½ years of age.

2. Second generation bucks will be produced for the first time during July 2007 and will be available for measurement in October 2008.

Significant findings/results per objective to date:

Preliminary results indicate that antler size may have the genetic flexibility to increase in response to improved nutrition while the upper limit of body mass is more limited. Having greater phenotypic plasticity in antler size would allow bucks to take advantage of annual variations in nutrition. Growing larger antlers during periods of increased nutrition might improve their opportunity for breeding. Less phenotypic plasticity in upper limits of body mass could be tied to the fact that larger bodies are not temporary investments and could be costly to the buck's survival once nutrition returns to lower levels. Therefore, management emphasis placed on antler size would have greater chance of success than when placed on body mass.

Applications or broader impacts of significant findings, including economic impacts or projected impacts:

Applications and broader impacts will depend on final conclusions.

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**Project success relative to original objectives:**

Research proceeding as planned.

Project leveraging:

This project has leveraged \$177,122 in funds and in-kind gifts.

List post-docs and graduate students with title of thesis or dissertation, if completed, and estimated graduation date:

Blaylock, A.C. 2007. Effects of soil region, litter size, and gender on morphometrics of white-tailed deer fawns. Thesis, Department of Wildlife and Fisheries, Mississippi State University.

Dye, M.P. 2007. Effects of body mass, physiographic region, and environmental cues on reproductive timing in deer. Thesis, Department of Wildlife and Fisheries, Mississippi State University.