

THE INCIDENCE OF YOUNG-OF-THE-YEAR BREEDING BY GEORGIA COTTONTAILS¹

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ABSTRACT

Collection of 135 young females revealed a very low incidence of breeding by this segment of the cottontail populations in Georgia. These data question the significance of early adult breeding as a major factor in contributing to a higher incidence of young-of-the-year breeding. The influence of other parameters in the Southeast was suggested; soil fertility and hot, dry summer weather were most significant.

INTRODUCTION

Reproductive activity in young-of-the-year female cottontails was first reported by Cooley (1946). Bowers (1955), Bruna (1951), Casteel and Edwards (1964), Conaway, Wight, and Sadler (1963), Ecke (1955), Evans, et al. (1965), Hendrickson (1947), and Stevens (1962) have subsequently described this type of reproductive activity in various parts of the United States. However, no data are available concerning the incidence, degree, or importance of this phenomenon in cottontails in the South. Data on young-of-the-year breeding would help reveal the role such breeding plays in contributing to the fall hunting crop and to the total population dynamics of the cottontail for this area.

METHODS

In the three-year period 1965-67 a total of 135 young-of-the-year female cottontails were collected in Georgia from May 1 to January 31 (Table 1). Age of the individuals was determined by the eye lens technique. Only young-of-the-year greater than 70 days old were utilized in calculating results. Each animal was checked for the condition of teats, width of uterus, presence of mammary tissue, placental scars, implanted young, and condition of ovaries.

RESULTS

Only six of 135 individuals had present and/or prior reproductive activity. One rabbit from the Piedmont region of Georgia collected August 29, 1966, was lactating and another collected October 31, 1965, possessed placental scars. One individual collected from the Coastal Plain region on December 6, 1966, had placental scars and enlarged teats.

Two pregnant and lactating young-of-the-year were collected from the Coastal Plain on August 30, 1967. The 10-day and 13-day-old embryos of the two females denoted conception as having taken place on August 20 and August 17, respectively. Back-dating revealed prior conception dates on July 23 and July 20. Birth of both of the young females' first litters occurred when they were just over four months old. Another young female collected on August 27, 1966, was pregnant with her first litter. Implanted young were determined to be 20 days old or conceived on August 7, 1966. Total young-of-the-year showing indications of breeding was 4.4 percent for the 135 individuals collected.

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DISCUSSION

Lord (1958) in Illinois and Negus (1959) and Stevens (1962) in Ohio have reported relatively high incidences of breeding among young-of-the-year (27, 50, and 44 percent, respectively). Negus (1959) emphasized that the amount of young-of-the-year breeding was probably dependent largely on the success of adult breeding earlier in the season. Conaway and Wight (1962) also suggested that an earlier beginning of breeding by adult females would influence the incidence of young-of-the-year breeding. Negus (1959) noted (but did not mention the possible significance) that there was considerable variation in the age at which sexual maturity was attained. His data therefore suggest that early adult breeding might not be so influential in determining the degree of breeding by young-of-the-year. Three of the six reproductively active young in the present study were born after the middle of March.

Adult rabbits in Georgia begin breeding earlier than those in Ohio and Illinois and other northern areas. Since only six of 135 young-of-the-year Georgia rabbits were found to be reproductively active their first year, the Georgia data suggest that earlier adult breeding may not be as important a factor as reported from more northern areas. Within Georgia, earlier first conceptions among adult cottontails of the Coastal Plain (as compared to Piedmont individuals), did not confer any advantage of young-of-the-year breeding of the Coastal Plain individuals over Piedmont.

Multiparous young-of-the-year were reported by Conaway, Wight, and Sadler (1963), Negus (1959), and Casteel and Edwards (1964). Casteel and Edwards reported the earliest conception date of June 25 when a young female was only 85 days old. A 75-day-old female is the youngest reproductively active female thus far reported in the literature (Negus, 1959). Age at first breeding for these animals is much less than that of the multiparous individuals reported in the present study. Reasons for the earlier and more frequent breeding of young rabbits in other areas may be associated with the same factor or factors governing incidence of young-of-the-year breeding and their age at sexual maturity.

Soil and plant nutrients available in some areas in greater amounts may be an important influence and should be considered along with earlier adult breeding. Williams and Caskey (1965) pointed out that one of the first symptoms of nutritional deficiencies manifested by wildlife is failing reproduction. Also, Stevens (1962) and Williams and Caskey (1965) noted decreased fecundity among cottontails collected from poorer soils (significantly less calcium, magnesium, potassium, phosphate, and organic matter). Lord (1960) cited the compensatory effects of larger litter sizes of cottontails in the northern United States where breeding seasons are shorter and winters more extreme. This compensatory factor may also be relevant in considering the previously mentioned degree of young-of-the-year breeding for that region of the country. Hot and/or dry summer weather might also have a major effect on success or failure of breeding by young cottontails. Hill (1965), Mossman (1955), and Odum (1955) noted the depressing effects of hot and/or dry weather on reproduction of various adult mammals including the cottontail. Hill's (1965) data lend strong evidence to the fact that dry weather has a significant effect on adult cottontail reproduction in the South. There is no reason to assume that this effect would not be felt by young of the year also. Recent research on the effects of plant estrogens on mammalian reproduction might shed further light on factors affecting not only cottontail breeding in general but also young-of-the-year breeding specifically.

These data in the present study indicate that young-of-the-year breeding by Georgia cottontails during 1965-67 added little to the fall hunting crop or total population dynamics of the species. Factors other than early adult breeding likely played a more important role in determining the amount of young-of-the-year breeding. The influence of soil-plant factors and hot and/or dry summer weather is worthy of further research.

TABLE 1. Reproductive status of young-of-the-year female cottontails from Georgia

	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Total
Number Collected	2	3	13	24	27	10	17	19	20	135
Indications of Breeding * (Present or Previous)	0	0	0	4	0	1	0	1	0	6

LITERATURE CITED

- Barkelow, F. S., Jr. 1967. Latitude related to reproduction in the cottontail rabbit. *J. Wildl. Mgmt.* 26:32-37.
- Bowers, G. L. 1955. Unusual breeding of cottontails in Pennsylvania. *J. Mammal.* 36:303.
- Bruna, J. F. 1951. Kentucky rabbit investigations. Kentucky Dept. of Fish and Wildl. Resources, Federal Aid Project W-26-R. pp. 83.
- Casteel, D. A. and W. R. Edwards. 1964. Two instances of multiparous juvenile cottontails. *J. Wildl. Mgmt.* 28:858-859.
- Conaway, C. H. and H. M. Wight. 1962. Onset of reproductive season and first pregnancy of the season in cottontails. *J. Wildl. Mgmt.* 26:278-290.
- Conaway, C. H., H. M. Wight, and K. C. Sadler. 1963. Annual production by a cottontail population. *J. Wildl. Mgmt.* 27:171-175.
- Cooley, M. E. 1946. Cottontails breeding in their first summer. *J. Mammal.* 27:273-274.
- Ecke, D. H. 1955. The reproductive cycle of the Mearns cottontail in Illinois. *Am. Midl. Nat.* 53:294-311.
- Evans, R. D., K. C. Sadler, C. H. Conaway, and T. S. Baskett. 1965. Regional comparisons of cottontail reproduction in Missouri. *Am. Midl. Nat.* 74:176-184.
- Hendrickson, G. O. 1947. Cottontail breeding in its first summer. *J. Mammal.* 28:63.
- Hill, E. P., III. 1965. Some effects of weather on cottontail reproduction in Alabama. *Proc. Conf. S. E. Assn. Game and Fish Comm.* 19:48-57.
- Ingles, I. G. 1947. Natural history observations on the Audubon cottontail. *J. Mammal.* 22:227-250.
- Lord, R. D., Jr. 1958. The importance of juvenile breeding to the annual cottontail crop. *N. Am. Wildl. Conf. Trans.* 23:267-276.
- Lord, R. D., Jr. 1960. Litter size and latitude in North American Mammals. *Am. Midl. Nat.* 64:488-499.
- Lord, R. D., Jr. 1961. Magnitudes of reproduction in cottontail rabbits. *J. Wildl. Mgmt.* 25:28-33.
- Mossman, A. S. 1955. Reproduction of the brush rabbit in California. *J. Wildl. Mgmt.* 19:177-184.
- Negus, N. C. 1959. Breeding of subadult cottontail rabbits in Ohio. *J. Wildl. Mgmt.* 23:451-452.
- Odom, E. P. 1955. An eleven year history of a Sigmodon population. *J. Mammal.* 36:308-378.
- Sowls, L. K. 1957. Reproduction in the Audubon cottonail in Arizona. *J. Mammal.* 38:234-243.
- Stevens, V. C. 1962. Regional variations in productivity and reproductive physiology of the cottontail rabbit in Ohio. *Trans. N. Am. Wildl. and Nat. Resources Conf.* 27:243-253.
- Williams, C. E. and A. L. Caskey. 1965. Soil fertility and cottontail fecundity in southeastern Missouri. *Am. Midl. Nat.* 74:211-224.

* Determined by status of teats, mammary tissue, uterus, and ovarian analysis.