



2000

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Recommended Citation

Delehanty, David (2000) "Reproductive Effort of Female Mountain Quail Induced by Dietary Xanthophyll," *National Quail Symposium Proceedings*: Vol. 4 , Article 31.
Available at: <http://trace.tennessee.edu/nqsp/vol4/iss1/31>

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REPRODUCTIVE EFFORT OF FEMALE MOUNTAIN QUAIL INDUCED BY DIETARY XANTHOPHYLL

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ABSTRACT

Reproductive effort of quail in the arid American West is closely associated with spring precipitation and soil moisture levels. Profound fecundity during moist springs and weak reproductive effort during dry springs has been demonstrated for several species including the bobwhite (*Colinus virginianus*) and California quail (*Callipepla californica*). I tested the effect of dietary xanthophyll on reproductive effort of mountain quail (*Oreortyx pictus*), a native quail of the American West with a distribution that includes parts of the Mojave and Sonoran deserts. Precipitation data combined with trapping results from a wild Mojave population indicate that mountain quail respond to spring precipitation with strong reproductive effort. Xanthophyll is a naturally occurring yellow plant pigment that functions to prevent solarization in plants experiencing high light conditions. Xanthophyll is widely present in plants during green-up. Using captive mountain quail housed outdoors year-round, I experimentally altered dietary xanthophyll levels. Females supplemented with xanthophyll laid eggs at a significantly greater rate than did control females, and also laid more eggs overall. Juvenile females entering their first breeding season rapidly enlarged their reproductive tracts when exposed to dietary xanthophyll early in the breeding season. Juvenile females fed a xanthophyll supplement for two weeks had significantly larger individual ova, oviducts, and total reproductive tracts than did control females. Male mountain quail exhibited enlarged testes and performed reproductive behaviors regardless of diet. Finally, during the breeding season, females sought out and ate significantly more green vegetation than did males. If other quail exhibit a similar response, then these phenomena have great potential for explaining the onset, magnitude, and duration of reproductive effort in undisturbed quail populations, and populations experiencing land use changes that alter the availability of dietary xanthophyll.

Citation: Delehanty, D. 2000. Reproductive effort of female mountain quail induced by dietary xanthophyll. Page 125 in L.A. Brennan, W.E. Palmer, L.W. Burger, Jr., and T.L. Pruden (eds.). Quail IV: Proceedings of the Fourth National Quail Symposium. Tall Timbers Research Station, Tallahassee, FL.