



2012

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### Recommended Citation

Plush, Charles J.; Moorman, Christopher E.; Orr, David B.; and Reberg-Horton, Chris (2012) "Do Beneficial Insect Habitats Also Provide Quality Brood Habitat for Northern Bobwhite?," *National Quail Symposium Proceedings*: Vol. 7 , Article 73.

Available at: <http://trace.tennessee.edu/nqsp/vol7/iss1/73>

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# DO BENEFICIAL INSECT HABITATS ALSO PROVIDE QUALITY BROOD HABITAT FOR NORTHERN BOBWHITE?

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## ABSTRACT

Strips of fallow vegetation along cropland borders are an effective strategy for providing northern bobwhite (*Colinus virginianus*) habitat. However, a limitation of fallow borders is the lack of nectar-producing vegetation needed to sustain many beneficial insect populations. Planted borders that contain mixes of prairie flowers and grasses may harbor more diverse arthropod communities, but the relative value of these borders as bobwhite brood habitat compared to fallow borders is unknown. Vegetation composition likely has the largest influence on a field border's structural characteristics, which consequently may impact bobwhite foraging efficiency. Thus, actively planting field borders may not yield the vegetative composition and structure needed to provide quality brood habitat. We used groups of 6 human-imprinted bobwhite chicks as a bioassay for comparing 4 different field border treatments (planted native warm season grasses (NWSG) and prairie flowers, planted prairie flowers only, fallow vegetation, or mowed vegetation) as brood habitat from June to August 2009 and 2010. All field border treatments (0.33 ha each) were established around 9 organic crop fields. Groups of chicks were led through borders for 30-min foraging trials and immediately euthanized at the end of each trial. Their crops and gizzards were dissected in the laboratory, and eaten arthropods were measured, counted, and identified to taxonomic family. We used allometric equations to estimate the live weight of all arthropods consumed, and to calculate a mean foraging rate (grams of arthropods consumed/chick/30 min) for each field border treatment. We used a modified leaf blower-vacuum to sample arthropod prey availability and diversity in each field border treatment. Sampled arthropods were counted and identified to taxonomic family. We also calculated a Shannon-Weiner diversity index for each field border treatment. Foraging rate did not differ among border treatments in 2009 or 2010. Similarly, mean arthropod densities and diversity calculated from blower-vac samples did not differ among treatments in 2009 or 2010. Chick foraging rate was relatively high and arthropod prey was abundant even in mowed field borders. We suspect the amount of arthropod prey foods is likely not a limiting factor for bobwhite chicks in uncultivated habitats, rather, vegetative structure that facilitates movement, supports a suitable thermal micro-climate, and provides protection from predators is most important for bobwhite broods. Our results suggest that field borders planted for promoting beneficial insects provide bobwhite brood habitat equivalent to fallow borders. However, beneficial insect habitats are expensive, and require additional time and funding to insure successful establishment. The cost of establishing planted NWSG and prairie flowers and planted prairie flowers only borders in our study was ~\$1,928 and \$1,773/ha, respectively. Fallow borders are likely the most cost-effective option for landowners/managers whose primary interest is providing bobwhite habitat.

**Citation:** Plush, C. J., C. E. Moonman, D. B. Orr, and C. Reberg-Horton. 2012. Do beneficial insect habitats also provide quality brood habitat for northern bobwhite? Proceedings of the National Quail Symposium 7:125.

**Key words:** brood habitat, *Colinus virginianus*, field borders, insects, northern bobwhite

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