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## A suggested approach for design of oak (*Quercus* L.) regeneration research considering regional differences

Daniel C. Dey · Martin A. Spetich · Dale R. Weigel · Paul S. Johnson ·  
David L. Graney · John M. Kabrick

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**Abstract** Research on oak (*Quercus* L.) regeneration has generally consisted of small-scale studies of treatments designed to favor oak, including consideration of site quality and topographic effects on oak regeneration. However, these experiments have not consistently factored in broader-scale ecological differences found in the eastern United States. Oak regeneration experiments should be replicated at appropriate ecological scales to address the similarities and differences in regeneration following prescribed silvicultural treatments among ecological units. Patterns in oak regeneration can be better understood in an ecological context by considering how oak species interact in the differing physical environments and are able to maintain dominance in changing complexes of competing vegetation among the selected eco-units. Our understanding of oak regeneration response to specific silvicultural practices and our ability to model regeneration is improved when we use replication, blocking, or factorial deployment of relatively small-scale (0.5–1.0 ha) treatment plots within an ecological classification system. We present an example of this approach to understanding oak regeneration dynamics in a synthesis of research to regenerate northern red oak (*Quercus rubra* L.) by underplanting shelterwoods in Arkansas, Missouri and Indiana. We summarize important considerations to guide the design of future research in oak regeneration.

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Paul S. Johnson and David L. Graney—Retired U.S. Forest Service scientists.

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D. C. Dey (✉) · J. M. Kabrick  
U.S. Forest Service, Northern Research Station, 202 ABNR Bldg, Columbia, MO 65211, USA  
e-mail: ddey@fs.fed.us

M. A. Spetich  
U.S. Forest Service, Southern Research Station, Hot Springs, AR, USA

D. R. Weigel  
U.S. Forest Service, Hoosier National Forest, Bedford, IN, USA

P. S. Johnson · D. L. Graney  
U.S. Forest Service, Southern Research Station, Hot Springs, AR, USA