

**POPULATIONS OF THE RENIFORM
NEMATODE, *ROTYLENCHULUS RENIFORMIS*:
DIFFERENCES IN THEIR
REPRODUCTION AND PATHOGENICITY
ON COTTON
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Abstract

The reniform nematode *Rotylenchulus reniformis* (*Rr*), is worldwide in distribution, possesses great fecundity, has life stages adapted to resist environmental stresses, parasitizes over 50 agricultural plant species, and is highly pathogenic to cotton and soybean. Data from laboratory, field, microplot, and greenhouse studies conducted between 1993 and 1998 with 12 isolates of this nematode from all cotton-producing states in the southern USA and Hawaii clearly support the hypothesis that biological “races” of *Rr* exist in cotton agroecosystems of the southern USA.

Supporting evidence from field studies includes differential cotton cultivar performance (with yield differences as great as 20%) and nematicide efficacy (nonsignificant to highly significant reductions in population densities of *Rr*) among locations with nearly identical growing conditions and cotton-related pests. Evidence from microplot cultivar inoculation studies (conducted employing populations of *Rr* derived from single egg masses) includes highly significant differences among populations in reproduction (47-455 fold increases in population density during a single season) and cotton growth suppression (ranging from 8-63%).

Greenhouse data also showed consistent differences in host suitability and preference among *Rr* isolates. The six plant species (‘Deltapine 61’ cotton, ‘NC 95’ tobacco, ‘California Wonder’ pepper, ‘Charleston Grey’ watermelon, ‘Florunner’ peanut, and ‘Rutgers’ tomato) commonly employed for separation of common species of root-knot nematode were inoculated with 500-535 eggs and juveniles of *Rr* and reproductive rates ($R = Pf/Pi$, where R =the reproductive value and Pf =final population density in soil and Pi =infestation level) were calculated after 90 days. Reproductive values for populations over two trials ranged from: 9.4 to 163.0 on cotton, 8.2-144.9 on tobacco, 0.1 to 31.7 on pepper, 0.1-0.2 on watermelon, 0.1-3.7 on peanut, and from 140.3-232.5 on tomato.