

## Mitigating Groundnut Rosette Disease Infections in Northern Ghana: The Importance of Planting Dates, Insecticides and Varieties

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A major limiting biotic constraint in groundnut cultivation in many Sub-Saharan African countries is the groundnut rosette disease (GRD). In northern Ghana, many farmers in major groundnut growing communities abandon their farms because of this disease. To mitigate crop losses caused by GRD, a field trial was conducted to assess the effects of planting time, insecticide application and variety on GRD severity and yield. A split-split plot experimental design with 4 replications was used. The main plot factor was planting time (mid-May, early June, mid-June) while insecticide application (no spray, one spray, two sprays) was the sub-plot factor. The sub-sub plots contained the groundnut varieties (Chinese, Sarinut 1, Sarinut 2, Nkatiesari). Data was collected on aphid (*Aphis cracivora*) and rosette disease scores, haulm weight, pod maturity and yield. The scale for aphid scores ranged between 0 (i.e., aphids completely absent) and 5 (i.e., > 80% of groundnut plants covered by aphids). Also, GRD severity was assessed using a scale that ranged from 0 (i.e., no visible symptoms on the leaves) to 5 (i.e., severe disease symptoms on > 70% of the leaves with stunting of plants). Aphid infestations were highest (3 = aphids spread on all stems and new trifoliolate leaves) in groundnut planted in mid-May without protection from aphids. In contrast, early June plantings that were either sprayed once or twice had fewer aphids (1 = early instar nymphs present). For GRD, severity was highest in groundnut planted in mid-May and lowest in those planted in mid-June. As expected, the severity of GRD was highest in unprotected groundnut and lowest in those sprayed twice with insecticide. There was a strong positive correlation between aphid and rosette scores ( $r^2 = 0.616$ ). Pod yield was significantly affected by the varieties only ( $p = 0.030$ ) but not insecticide treatment for aphid control. The highest yield was recorded for Sarinut 2 while Chinese yielded the lowest with yield of the other varieties intermediate. These findings suggest that mitigating haulm and pod yield losses due to GRD requires spraying against aphid infestations and selecting appropriate improved varieties. While insecticide treatment reduced GRD, variety resistance was a more important contribution to GRD management.