

***Striga* germination stimulants and haustorium factors from sorghum residues**

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Abstract: The life cycle of the root parasitic weeds *Striga* spp. follows an orderly sequence of events coordinated by host-derived signals. In nature seeds germinate in close vicinity of the host root, radicles elongate, exchange chemical signals with host roots and connection organs, haustoria, develop. The latter's attaché, penetrate the host roots, connect with the xylem and subsequently the parasite shoots develop. Inhibition and /or perturbations of the early developmental events may lead to abortion of parasitism. In the present study the effects of sorghum residues on germination and subsequent pre-attachment developmental stages were investigated. Three sorghum varieties, Wad Ahmed, *Striga* tolerant, Tetron and Hakika, *Striga* resistant, were employed. Field grown plants harvested periodically, were divided into shoots and roots, dried under shade and ground into powder. The powder, mixed with agar, was assayed for activity using conditioned *S. hermonthica* seeds. The activity of the powder showed dependence on genotype, time of harvest and the amount used. Powder from Sorghum harvested 10 and 120 days after planting (DAP), irrespective of genotype or organ, induced negligible to low germination (0-38%). However, residues from harvests made 20-90 days after planting displayed differential activities. Shoot powder from Wad Ahmed harvested 20 DAP displayed moderate to high activity (65-75% germination) at the lowest amounts (10-30 mg). A further increase in powder reduced germination considerably. Powder from harvest made 40 DAP showed maximum activity (89% germination) at the lowest amount (10 mg). A further increase in powder amount reduced germination by 40-49%. Powder from harvest made 90 DPA displayed maximum activity (71% germination) at 20mg. Powder from Tetron shoot was generally less active. Powder from harvest made 20 DAP displayed highest activity (52-60% germination) at 20-50 mg. Powder from harvest made 40DAP induced maximum germination (46-61%) at 30-50 mg. A further increase in powder amount had no significant effects. Powder from harvest made at 90 DAP showed maximum activity (65% germination) at 30 mg. Powder from Hakika, in general, displayed the least activity. Powder from harvests made 20, 40 and 90DAP induced 22-37%, 15-41% and 17-27% germination, respectively. Powder from roots harvested 20-90 DAP displayed higher activity than shoot's powder. Root powder from Wad Ahmed harvested 20 and 40 DPA induced moderate to high (62-93%) germination. Powder from roots harvested 90 DAP displayed high activity (73-90% germination). Powder from Tetron roots harvested 20 and 40 DPA was, however, less active and induced 49-88% germination. Delaying harvest to 90 DPA increased activity (66-96% germination). Powder from roots of Hakika, among the three sorghum genotypes, displayed the lowest activity. Powder from harvests made 20 and 40 DPA displayed poor to moderate activity (8-54%) germination. Powder from harvest made 90 DPA was more active and induced moderate (49%) to high (85%) germination. Sorghum shoots and roots contain both germination stimulants and inhibitors the proportion of which varies with genotype and growth stage. Germination and haustorium initiation in *Striga* were contemporaneous. Concurrent induction of germination and haustorium initiation reduces radicle extension and minimizes contact with the host roots.

Keywords: parasitic weeds, haustorium, pre-attachment, resistant