Spatial distribution and seasonal life history of *Aceria malherbae* (Acari: Eriophyidae) on *Convolvulus arvensis* in Montana, USA

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Field bindweed, *Convolvulus arvensis* L. (Convolvulaceae), is one of the most aggressive, perennial weeds of grain-producing areas of North America. To control this weed, the leaf-galling mite, *Aceria malherbae* Nuzzaci (Acari: Eriophyidae) has been utilized. The phenology and spatial distribution of the mite were followed for a three-year period (2000–2002) in central Montana. Stems emerged late in May and continued to emerge until mid-July. Thereafter, numbers generally declined due to senescence caused by dry conditions. In contrast, the number and percent of infested stems increased during the summer. Approximately 20 to 27% of stems were infested in early spring. By late August, between 39 and 62% of the remaining stems were infested. No significant declines in stem densities were observed, although densities varied within the season depending upon moisture, as well as among years. Leaf production generally increased during the summer. In early June, 9 to 13% of leaves were infested, whereas by early autumn, 20 to 42% of leaves present were infested. Greater numbers of galls were observed on leaves in the upper stem crown. In 2000, mean mite populations per gall increased during the season, whereas in 2001 and 2002, populations peaked in July and then decreased. Mites dispersed to root buds during the drier parts of the summer, but were also located on buds throughout the season. Both bindweed stems and infested stems were spatially aggregated within plots. This aggregation, although somewhat consistent from year to year, varied throughout the season and among years. Weak associations between stem densities and the presence of infested stems were noted. These associations did not reflect the intensity of mite infestation. Slight microhabitat differences may exist which would influence the success of the mite to overwinter and to repopulate plants the following year.

Phomopsis amaranthicola as a post-emergence bioherbicide in peppers (*Capsicum annuum* and *C. frutescens*) and eggplant (*Solanum melongena*)

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Pigweeds (*Amaranthus* spp.) are among the most abundant weeds occurring in vegetable crops throughout the world. Biological suppression of pigweeds is desirable in organic and/or conventional production systems in which selective chemical herbicides are lacking, limited or not efficacious. In several field experiments, the fungus *Phomopsis amaranthicola* was evaluated as a post-emergence bioherbicide to control *Amaranthus lividus* in bell pepper (*C. annuum*), and *A. dubius* in Caribbean-bonnet pepper (*C. frutescens*), and eggplant (*S. melongena*). In all experiments, the fungus was sprayed at run-off volume on the weed/crop canopy at a rate of 1.0–1.5 million conidia per mL. Pigweeds that survived inoculation with *P. amaranthicola* were allowed to interfere with the crops season-long. In eggplant and Caribbean-bonnet pepper, spraying *P. amaranthicola* 10 days after weed emergence (DAE) caused about 30% mortality in different population densities of *A. dubius*, and resulted in yield loss reductions of about 25% in pepper and 16% in eggplant, as compared with the untreated weedy crops. In the bell pepper experiments, the results were similar when using a *Psyllium* mucilloid or an agricultural oil (PCC-588) as a surfactant in the spraying mix. In bell pepper, two applications of *P.