

Seedbank dynamics and integrated management of *Parthenium hysterophorus* in vegetable capsicum

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Abstract: Weed seedbank was assessed and an integrated weed management package was developed to control *Parthenium hysterophorus* in vegetable capsicum. Field experiments were conducted simultaneously in a Parthenium-site (PS) and Parthenium-free site (PFS) during two consecutive seasons in a split-plot design replicated three times. Primary tillage (ploughing and manual weeding) were the main plots and sub-plots consisted of post-tillage practices; (a) Oxyfluorfen applied two-days before transplanting the crop (180 g a.i. ha⁻¹), (b) gliricidia leaf mulch applied soon after transplanting (6 t ha⁻¹, 68% moisture), and (c) control. After transplanting, all weeds in PS, except *P. hysterophorus*, were removed manually in all plots bi-weekly, while weeds were not controlled in PFS. *Parthenium hysterophorus* in PS and *Cyperus rotundus* in PFS dominated the soil seedbank in upper 0–5 cm. Soil seedbank of *P.hysterophorus* in PS was higher in season-1 (March–August) than in season-2 (September–February) and viable even when buried 15 cm deep. Interaction between primary and post-tillage practices was not significant ($P > .05$) on plant height, canopy width, and yield of the crop. Capsicum yield in PFS was 40% higher in season-1 and 9.5% higher in season-2 compared to those of PS, due to lower weed competition and higher crop growth in the former. Manual weeding or ploughing as primary tillage followed by mulching with gliricidia leaves as a post-tillage practice suppressed *P. hysterophorus* effectively and enhanced growth and yield of vegetable capsicum.