Horizontal and vertical distribution of weed seed bank in Saffron (*Crocus sativus* L.) fields.

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Abstract: Geostatistical techniques were used to describe and map the spatial distribution of saffron weed seed bank populations. In three fields located on a private farm near Boshrooyeh (33 North latitude, 57 East longitude), Razavi Khorasan, Iran, weed seeds were identified and counted at 144 points of each saffron field (0.2 ha) based on a 4 m by 4 m grid at two depths of 0-7.5 and 7.5-15 cm in 2005. The seeds of ten weed species were observed across the saffron fields. The semivariogram and cross-semivariogram analysis for common species showed that the range of influence varied with weed species and field. The result indicated that the nugget ratio was 1 to 100 percent depends on weed species (low nugget ratio for species that did not have any seed dispersal mechanism and seeds exhibited an aggregated pattern around the mother plant and conversely, high nugget ratio for species that had a random seed distribution due to various dispersal mechanisms) in three fields. *Carduus pycnocephalus* density data showed nugget ratio of 100 percent, indicated that no spatial dependence was found. *Hordeum spontaneum* and *Polygonum aviculare* seed bank data showed moderate to strong spatial dependence at two depths, which suggests that the seed bank distribution pattern of these weeds was patchy. Spatial dependence of *Cardaria draba* seed bank varied with field (from 43% to 76%). The cross-semivariogram analysis for seed bank data between two depths showed spatial dependence for *Hordeum spontaneum* (21%-98%) and *Polygonum aviculare* (56%-90%) and *Cardaria draba* (60%-75%), while no spatial dependence was found for *Carduus pycnocephalus* seed bank. The maps also showed elongated patches along the field more likely due to direction of irrigation and tillage practices. Patchy weed seeds distribution offers large potential for using site-specific weed control on some fields.