

Using Passive Solar Heating Tents for Eradication of Weed Seed-Bearing Plant Material in Remote Areas

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A discovered infestation of live and skeleton plants of the Class ‘A’ weed pest, Iberian starthistle (*Centaurea iberica*), in Mariposa County prompted initiation of a field and laboratory project to adapt solar heating techniques for seed eradication. To facilitate off-site methods testing, seeds of invasive, but non-quarantined, tocolote (*C. melitensis*), collected from the Santa Monica Mountains Recreation Area in Ventura County, also were used. Field testing showed that an adaptation of the “double tent” solarization technique (www.solar.uckac.edu), designed for soil disinfestation, could provide inside air temperatures of more than 70 C (158 F) during warm summer days. Field and laboratory testing pointed out the critical need for moisture in the seed bags in order to obtain desired efficacy. Thermal inactivation studies were conducted on seeds exposed at 42, 46, 50, 60, and 70 C. The studies indicated that, at the higher temperatures of 60 and 70 C, seeds of both *Centaurea* species tested could be inactivated over the course of a single day of treatment, under conditions similar to those encountered in Mariposa County. Initial field validation in the San Joaquin Valley confirmed model guidelines, allowing no survival of hydrated *C. melitensis* seeds after one day of exposure. On the other hand, survival of non-hydrated seeds under similar conditions was documented. This technique may be of value for on-site eradication of seeds from localized infestations of invasive weed pests. It could be adaptable for use on infestations discovered in remote areas, where attempted removal of viable seeds or seed-bearing material might result in unwanted seed dispersal.