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A Remotely Piloted Aerial Application System to Control Rangeland Grasshoppers

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Abstract : The grasshoppers comprised of heterogeneous assemblages of Acrididae (Family: Orthoptera) species periodically reach outbreak levels by their gregarious behavior and voracious feeding habits, devouring stems and leaves of food crops and rangeland pasture. Cattle consume about 1.5-2.5% of their body weight in forage per day, so pound for pound, a grasshopper will eat 12-20 times as much plant material as a steer and cause serious economic damage to the cattle industry, especially during a drought when forage is already scarce. Grasshoppers annually consume more than 20% of rangeland forages in the western United States at an estimated loss of $1.25 billion per year in forage. A remotely piloted aerial application system with both a spreader and spray application system was used to apply granular insect bait and a liquid formulation of Carbaryl for control of grasshopper infestations on rangeland in New Mexico, United States. Pattern testing and calibration of both the granular and liquid application systems were conducted to determine proper application rate set up and distribution pattern. From these tests, an effective swath was calculated. Results showed that 14 days after application, granular baits were only effective on those grasshopper species that accepted the baits. The liquid formulation at 16 ounces per acre was highly successful at controlling all grasshopper species. Results of this study indicated that a remotely piloted aerial application system can be used to effectively deliver grasshopper control products in both granular and liquid form. However, the spray application treatment proved to be most effective and efficient for all grasshopper species present.

Keywords : Carbaryl, Grasshopper, Insecticidal Efficacy, Remotely Piloted Aerial Application System
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