

COMPLETED PROJECT REPORT

Project Title: Potential repellents for bird control in Lettuce.

Research Agency: National Wildlife Research Center

Principal Investigator: Cummings

Budget: \$60,600.00

Summary:

April 1998: The NWRC began in Nov. 1995 to evaluate several potential repellents to reduce horned lark damage to lettuce seeds and seedlings. Over 150 horned larks were captured during April and May 1995 in Colorado for use in this study. For the initial phase of this study, 5 compounds (methyl anthranilate, methiocarb, activated charcoal, lime, and fipronil) were tested in the laboratory. The Iceberg Lettuce Advisory Board assisted in obtaining lettuce seed and having it treated with the respective compounds. After treatment, the lettuce seed was clay-coated by Synergene Seed.

Laboratory experiments compared the consumption of lettuce seed treated with potential repellent compounds. In the first experiment, horned larks offered a 50:50 mixture of untreated grain and lettuce seed consumed significantly more untreated grain ration than untreated clay-coated lettuce seed. In a second experiment, horned larks given a choice between untreated clay-coated lettuce seed and clay-coated lettuce seed treated with the 5 potential repellent compounds at a 1% concentration, consumed an insignificant amount of all seeds, including untreated coated lettuce seed. The study had to be terminated because the birds lost up to 18% of their body weight in 3 days. These experiments indicate that horned larks do not readily consume clay-coated lettuce seed.

Additional laboratory tests were conducted to determine the effectiveness of the 5 chemical compounds as over-sprays on sprouting lettuce seedlings. After a 3-day pretreatment period, horned larks were offered a preferred food mix and a flat containing from 80 to 120 3-day old lettuce seedlings. The flats of lettuce seedlings were over-sprayed with methyl anthranilate (8 kg/ha), methiocarb (4 kg/ha), activated charcoal (32 kg/ha), lime (32 kg/ha), or fipronil (4 kg/ha). During a 3-day post treatment period, only methyl anthranilate and methiocarb significantly reduced horned lark consumption of lettuce seedlings. No adverse effects on sprout vigor were documented from any of the compounds.

During January 1997 we evaluated the effectiveness of Mesurol (methiocarb) and ReJex-iT AG-145 (methyl anthranilate) for reducing damage by horned larks to lettuce seedlings in a field study. Two 14-ha lettuce fields were selected in the San Joaquin Valley that were receiving horned lark damage. In each field 6 0.1-ha study plots were established to evaluate the test chemicals. Mesurol was sprayed at 4 kg/ha and ReJex-iT Ag-145 at 64 kg/ha when lettuce

seedlings were about 1 and 0.5 cm height, respectively. Horned lark damage to seedlings in the treated plots was virtually unchanged throughout the 15 day test period; however, results were not significant because control plots received only slight damage. A combination of factors could have contributed to this: 1) the close proximity of test plots, which were only about 100m apart; 2) hazing efforts in and near treated plots; and 3) low bird pressure on treated plots.

During December 1997 the effectiveness of Mesurol (methiocarb) and Flight Control (an anthraquinone product) were evaluated for repellency to horned larks when applied on newly sprouted lettuce seedlings in a field setting. Six enclosures were established in each of two newly sprouted lettuce fields. Horned larks (6) were placed in each enclosure. Half of the enclosures were used as controls where lettuce seedlings were not treated. The lettuce seedlings in the other enclosures were treated with Mesurol or Flight Control. Both treatments reduced horned lark damage to lettuce significantly ($P < 0.08$). There was not a significant difference ($P < 0.3$) between the effectiveness of each compound. Field testing of both products on a larger scale is recommended. Results are being prepared for publication in Crop Protection.

November 1999: In lieu of a final report, a manuscript was submitted to CDFA. The manuscript, titled "Evaluation of Flight Control and Mesurol as repellents to reduce horned lark damage to lettuce seedlings in the San Joaquin Valley, California", will be submitted to the journal, "Crop Protection". Work on these two repellents continues under a new contract, 98-0418. An abstract for the manuscript is provided below: We conducted trials near Huron, CA in the San Joaquin Valley from 12 through 23 January 1999 to determine the efficacy of Flight Control (50% anthraquinone) and Mesurol (methiocarb) in preventing horned lark damage to lettuce seedlings. Flight Control (FC) and Mesurol were evaluated as foliar sprays at application rates of 4.75 l/ha and 2.27 kg/ha, respectively. Horned lark damage to lettuce seedlings treated with FC was greater ($p = 0.0154$) than for Mesurol, 60% versus 20%, respectively, and seedlings in control plots were 100% destroyed.

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