Anthraquinone-based Bird Repellent for Ripening Oilseed Sunflower

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<table>
<thead>
<tr>
<th>Bird</th>
<th>Seed</th>
<th>Threshold</th>
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Anthraquinone Laboratory Efficacy
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Anthraquinone for Ripening Sunflower - Fall 2010
Oilseed sunflower: Steele, ND

24 bird enclosures (4 m x 4 m) established: **July 20-21**
Oilseed sunflower: Steele, ND

24 bird enclosures (4 m x 4 m) established: July 20-21

Hand-sprayed 8 enclosures (0.5 gal Avipel/ac): **August 24 (R-6)**
Hand-sprayed 8 enclosures (1 gal Avipel/ac): **August 24 (R-6)**
Populated each enclosure with 10 red-winged blackbirds: **August 25**
CO₂ Backpack Sprayer for Ripening Sunflower
Oilseed sunflower: Steele, ND

24 bird enclosures (4 m x 4 m) established: July 20-21

Hand-sprayed 8 enclosures (0.5 gal Avipel/ac): August 24 (R-6)
Hand-sprayed 8 enclosures (1 gal Avipel/ac): August 24 (R-6)
Populated each enclosure with 10 red-winged blackbirds: August 25

Removed all birds (14 days post-applic): September 8
Hand harvested all enclosures: September 9-10
Field harvested: October 27
Sunflower Damage:

2010

- 34% damage @ 0.5 gal Avipel/ac
- 33% damage @ 1 gal Avipel/ac
- 44% damage among untreated enclosures
Results

- **Sunflower Damage:**
  
  - **2010**
    - 34% damage @ 0.5 gal Avipel/ac
    - 33% damage @ 1 gal Avipel/ac
    - 44% damage among untreated enclosures
  
  - **2009**
    - 18% @ 2 gal Avipel/ac
    - 64% damage among untreated enclosures
Results

- Harvested Seed Mass:
  - 2010
    - 2.2 kg/enclosure @ 0.5 gal Avipel/ac
    - 2.2 kg/enclosure @ 1 gal Avipel/ac
    - 1.9 kg/enclosure among untreated enclosures
Results

- **Harvested Seed Mass:**
  - **2010**
    - 2.2 kg/enclosure @ 0.5 gal Avipel/ac
    - 2.2 kg/enclosure @ 1 gal Avipel/ac
    - 1.9 kg/enclosure among untreated enclosures
  - **2009**
    - 2.5 kg/enclosure @ 2 gal Avipel/ac
    - 1.2 kg/enclosure among untreated enclosures
Anthraquinone Field Residues (2010)

- **Birds in (August 25)**
  - 481 ppm AQ @ 0.5 gal Avipel/ac
  - 978 ppm AQ @ 1 gal Avipel/ac

- **Birds out (September 8)**
  - 385 ppm AQ @ 0.5 gal Avipel/ac
  - 952 ppm AQ @ 1 gal Avipel/ac

- **Pre-harvest (Oct 20)**
  - 304 ppm AQ @ 0.5 gal Avipel/ac
  - 789 ppm AQ @ 1 gal Avipel/ac
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