

## Solving Crop Damage Sustainably

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# Cranes Select Habitats Intensively





Crop Damage = Intensive Habitat Selection



# Is this a problem?



## Damage = Removal of Planted Seeds







# **Corn Growth Stages**



Habitat Selection Occurs at Two Important Geographic Scales:





Between Food Items Within a Habitat

Between Habitats Within a Home Range

# Questions



**Does Deterrence Work in the Field?** 

- Do cranes respond to germinating corn?
- Does seed treatment reduce crane damage?

#### **Can Deterrence be Sustainable?**

- Can deterrence be adopted on a large scale?
- Will the technique persist?



# Study Area

(Between field selection)

#### Long Term Crane Research Study Area



## Sampling Protocol: (Within a Field)





15 row by 40 meter sample plot, highest crane use area

15 row by 40 meter control plot, no cranes observed in this area



Crane Use vs. Corn Availability

2007



Crane response to vulnerable corn



# A L CRANE OUTADATION

#### 2007 $R^2 = 0.86$ 2008 $R^2 = 0.80$ 2009 $R^2 = 0.91$

Cranes observed in vulnerable corn 2009

Crane Use vs. Corn Availability 2008-2009



#### Vulnerability of Corn Alone Does NOT Predict Crane Use of Field





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Crane Use vs. Seedling Difference by Treatment Type 2007-2009

Within Fields





Crane Use vs. Seedling Difference by Treatment Type 2007-2009





Crane Use vs. Seedling Difference by Treatment Type 2007-2009

#### **Crop Damage is a Solvable Problem**

Su Liying



Treated

**Mike Sawyers** 





Crane Density in Wisconsin in 2007 (Annual Midwest Crane Count)





**Deterrent Sold** in Wisconsin **during 2007** (purple) and 2008 (green) in **Relation to Crane Density** 

#### Area of Corn Treated with AQ

	2006	2007	2008	2009	2010	2011	2012	2013
WI	37,768	18,038	40,514	44,832	57,586	76,309	111,389	150,132
МІ	1,445	713	12,500	11,940	12,000	6,915	16,830	32,750
MN	632	12	1,200	3,000	2,000	830	2,676	6,750
тот ас.)	39,845	5 18,736	55,000	59,772	71,586	84,054	130,895	189,632

#### Cost of Treating 144,000 ac corn = \$720,000-\$1,008,000



**David Allerton** 

# Conclusions



**Does Deterrence Work in the Field?** 

- Yes, damage is reduced to zero.
- Yes, the problem does not move elsewhere (problem solved within fields).
- **Can Deterrence be Sustainable?**
- We are at a medium scale of coverage and acreage treated is still increasing. The potential is large.
- It is a process that individual growers will use. Persistence of deterrence will depend upon our ability to productively engage with private landowners.

#### **Thank You**



**George Archibald**