Effect of Post Emergence Herbicides on the Reflectance Response Patterns of Corn

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Objective:

Determine if selected POST herbicide treatments change the reflectance of corn

Materials and Methods:

– Herbicide Treatments (labeled rates):

- atrazine, bromoxynil, 2,4-D, dicamba + diflufenzopyr, nicosulfuron,

primisulfuron-methyl, untreated and bare soil

- all plots hand weeded

– RCB Design with 4 replications at Purdue Agronomy Research Center

Planted May 2, 2001 with treatments applied June 7, 2001

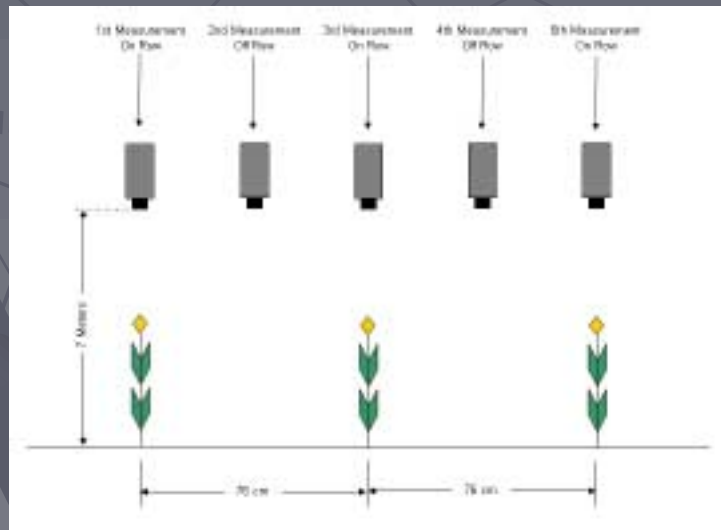Planted May 24, 2002 with treatments applied June 16, 2002

Data Collection

Ground - Hyperspectral

- Boom truck mounted GER 2600 field spectrometer
- Data collected June 16, 2001 and June 28, 2002

Aerial - Multispectral
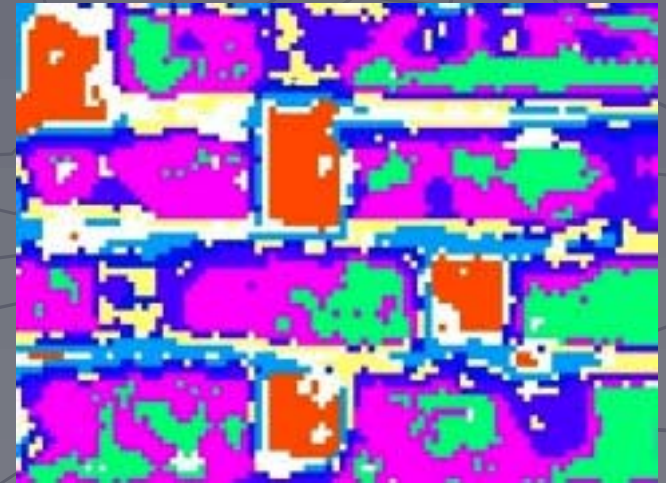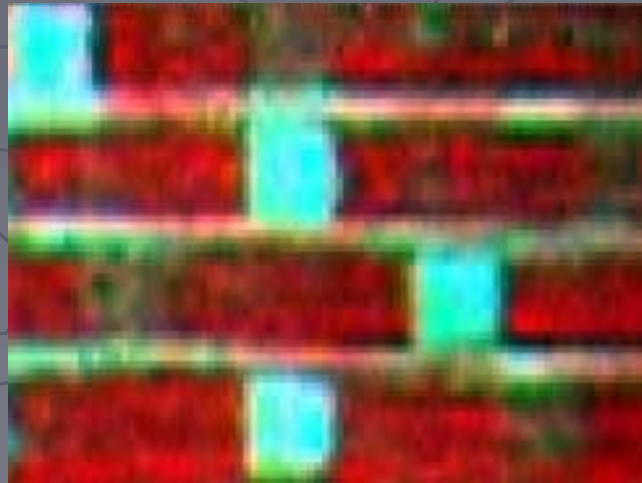
- Three band data
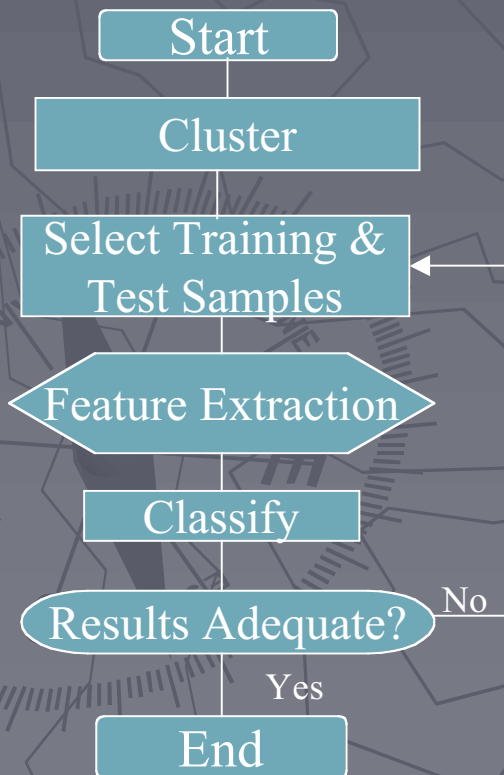- Collected July 2 both seasons

Classification Methods

MultiSpec

- Quadratic Maximum Likelihood Classifier
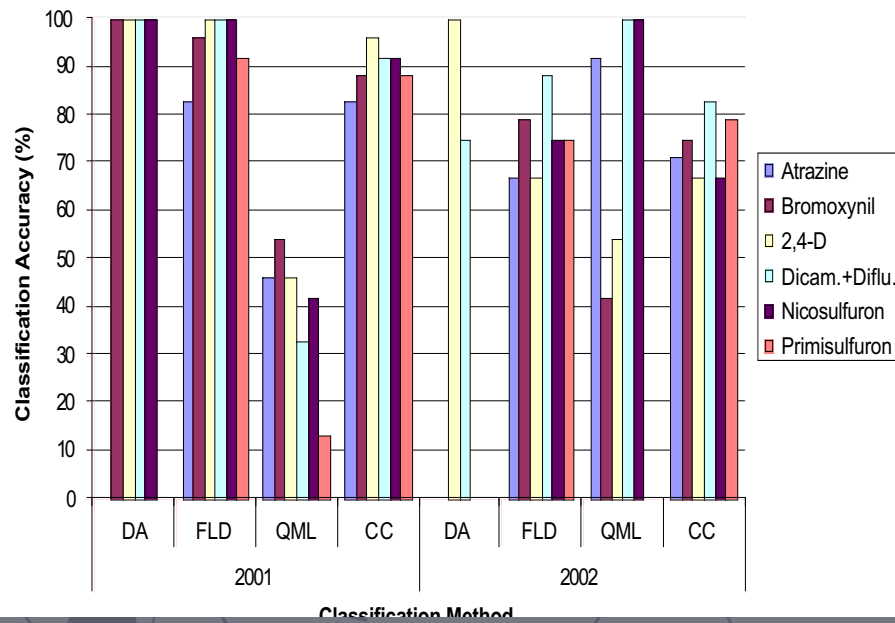- Fisher Linear Discriminant Classifier
- Correlation (SAM) Classifier
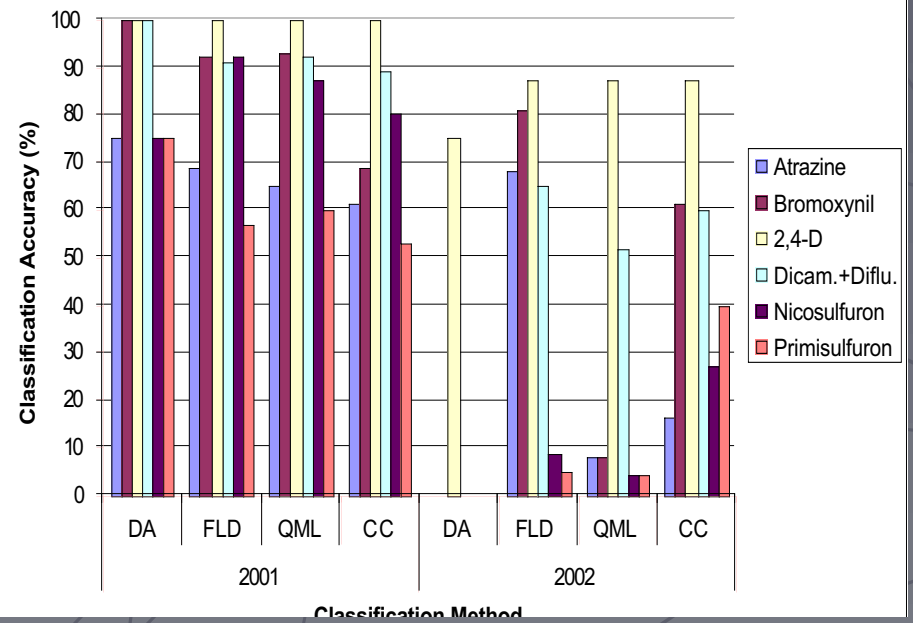
SAS

- PROC STEPDISC
- PROC DISCRIM

Results

Classification of Hyperspectral Ground-based Data

Classification of Multispectral Aerial Data

Conclusions / Implications

atrazine and primisulfuron-methyl were not separable from the untreated

- quickly metabolized by corn

dicamba + diflufenzopyr and 2,4-D are separable from the untreated

- can affect the growth of corn plants by onion-leafing new leaves or bending the stem

More work is need to determine whether bromoxynil and nicosulfuron are consistently separable from the untreated

Coincide with weed classification research

- Areas with known weed densities can be established in untreated areas
  – corn looks spectrally the same
- Reduce hand weeding costs

Use in Commercial Applications

- Drift or misapplication cases
- Herbicide use maps/surveys over large areas