Wheatland Conservation Area Inc
Southwest Agri-ARM Site

Agri-ARM Research Update 2013

ADOPT Project
"Demonstrating the Salt Tolerance of Hybrid Canola"

Presentation Outline

- Wheatland Conservation Area / Agri-ARM background
- ADOPT program
- Project introduction
- 2012 Project findings
- AAFC Salt Lab result summary
- Wrap up and acknowledgements

Wheatland Brief History

- Non-profit / producer run since 1982.
- Applied research
- Agri-ARM (8 sites)
- Trials

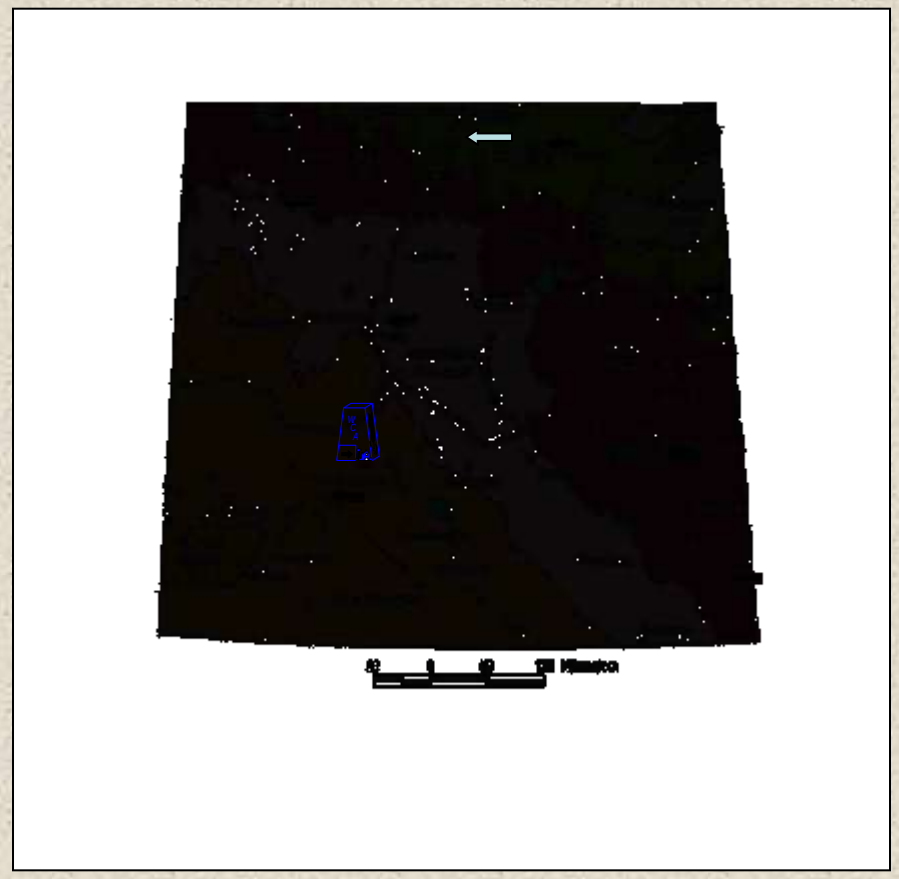
  -large and small plots

  -Commodity Groups

  -Governments

  -Industry and Universities

  -extension
- ADOPT projects



ADOPT Program Background

Agricultural Demonstration of Practices and Technologies

- The purpose of the ADOPT program is to accelerate the transfer of knowledge to Saskatchewan producers and ranchers.
- The ADOPT program will provide funding to help producer groups evaluate and demonstrate new agricultural practices and technologies at the local level.
- The results of successful trials can then be adopted by farming operations in the region.

Project Introduction (ADOPT #20110295)

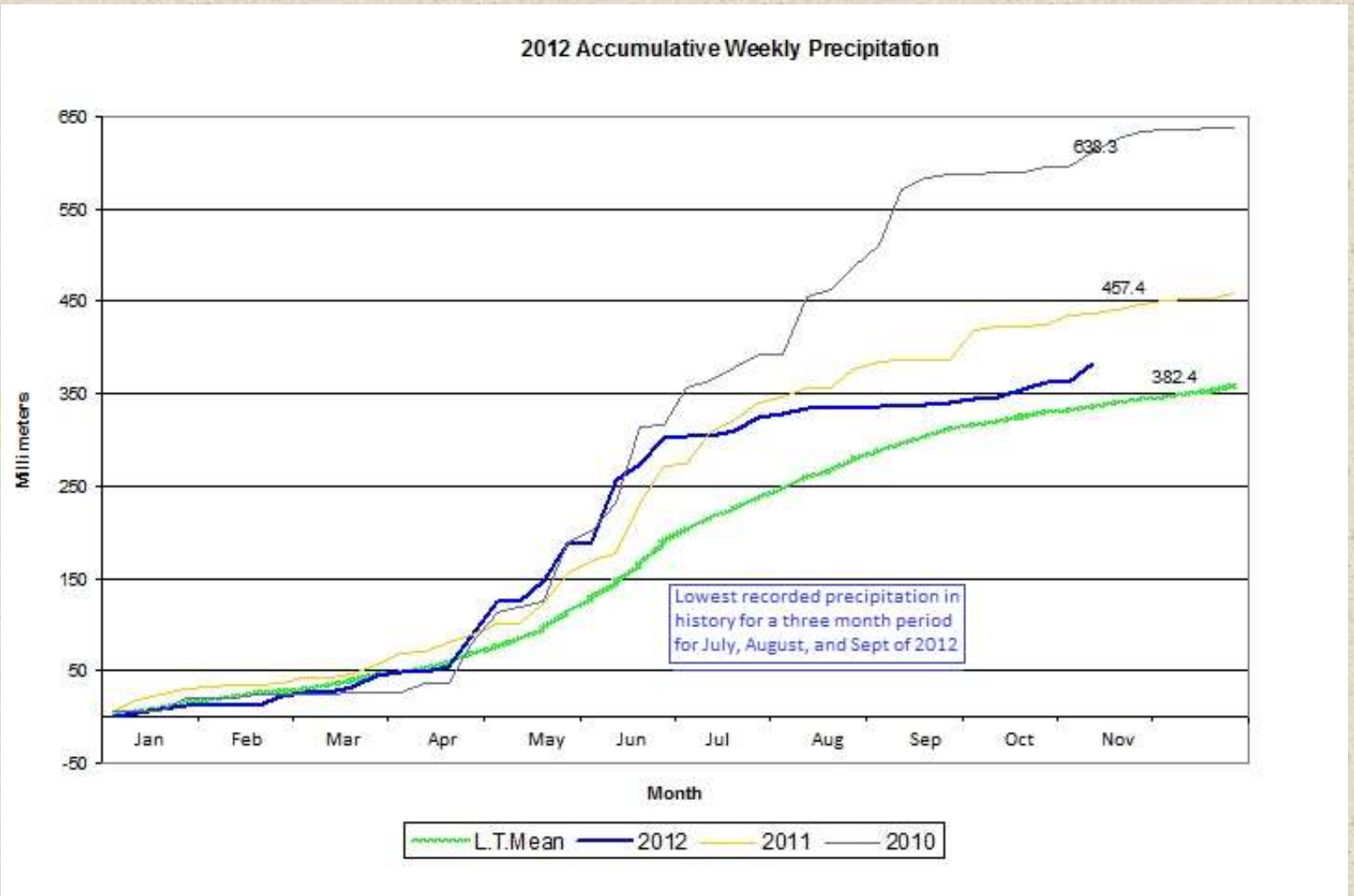
"Demonstrating the Salt Tolerance of Hybrid Canola"

- The objective of this project is to demonstrate the option of growing canola in saline conditions giving producers an agronomic alternative for saline fields with an economic advantage to barley.
- Use this demonstration as a venue to present results found by Dr. Harold Steppuhn in the AAFC Salt Lab.
- Demonstrated more varieties.

Relevance to Producers

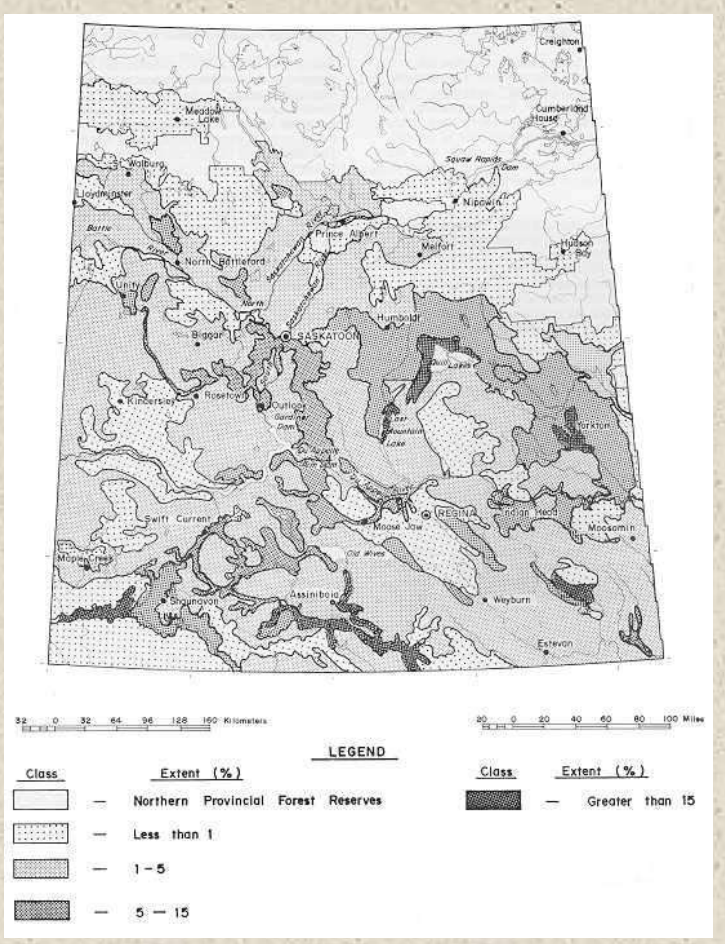
- The excessive rainfall and snow melt we have experienced over the past few years has resulted in saturated rooting zones and leaching, factors that contribute to soil salinity.
- With these conditions prevalent, there is potential for areas of moderate salinity to expand, limiting seeding options for producers to lower value cereals.

2012 Accumulative Precipitation



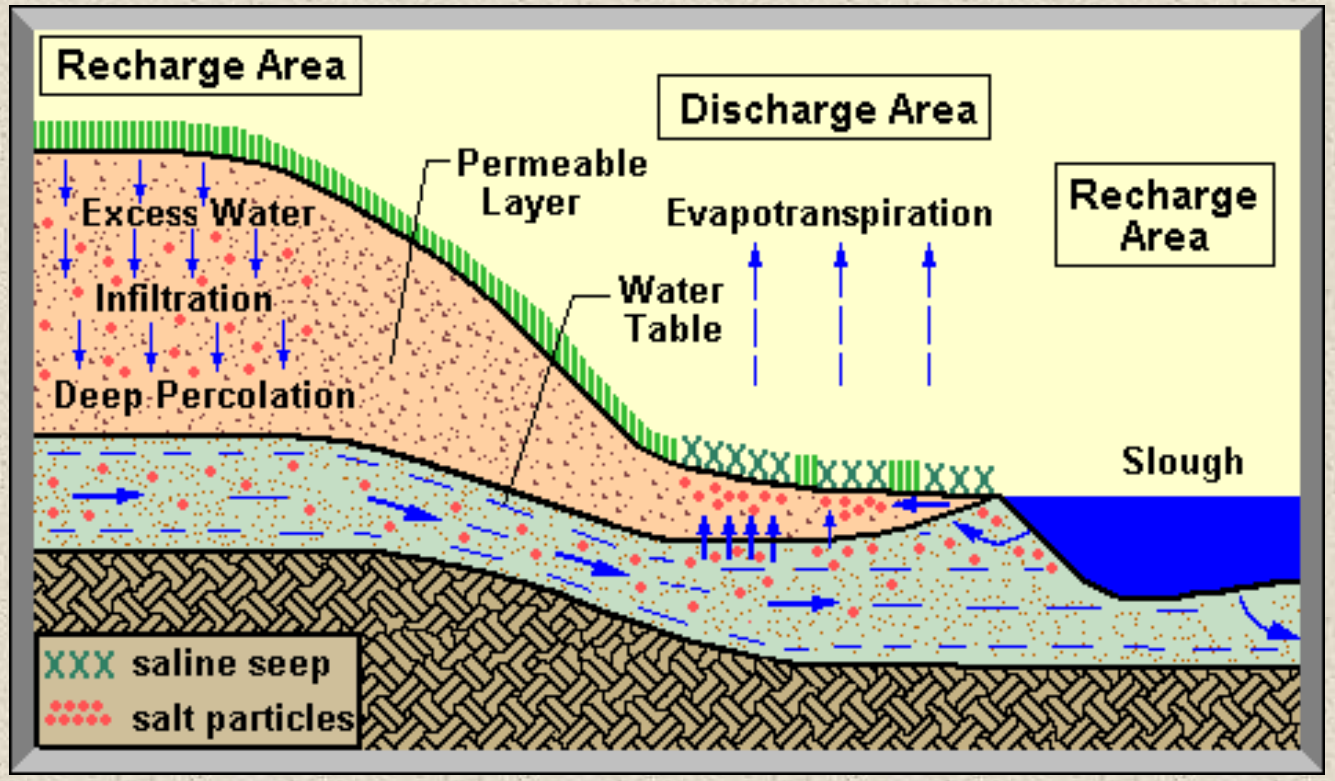
Salinity Estimates

- Agri-Food Canada estimates approximately 5.52 million acres (approximately 11.2 per cent) of agricultural land in Saskatchewan are at moderate to high risk of salinization.
- Saskatchewan Assessment estimates that 600,000 of these acres have zero production. (You only see the “Tip of the Iceberg”)



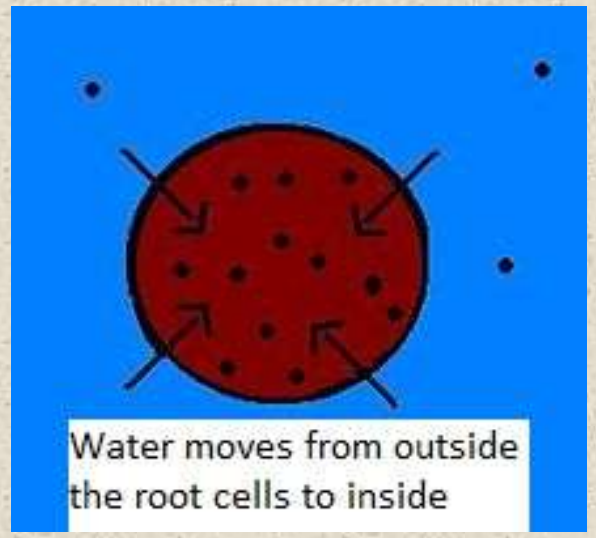
Causes and Affects of Soil Salinity

Schematic

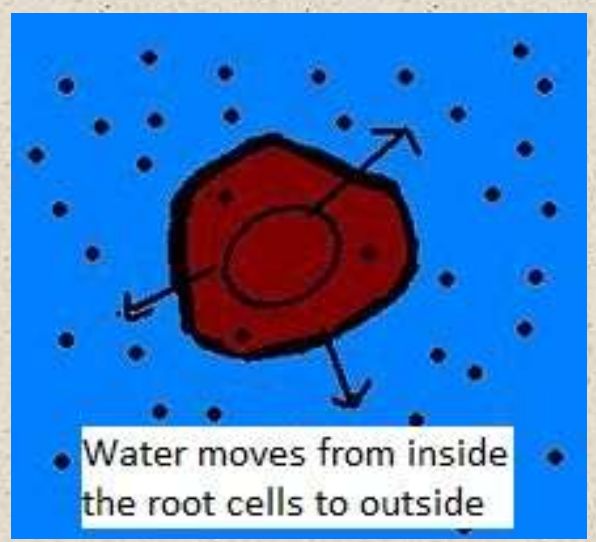


Why do plants not grow in salts

Plants take on water and nutrients through the cell walls in the plant roots through osmotic pressure.

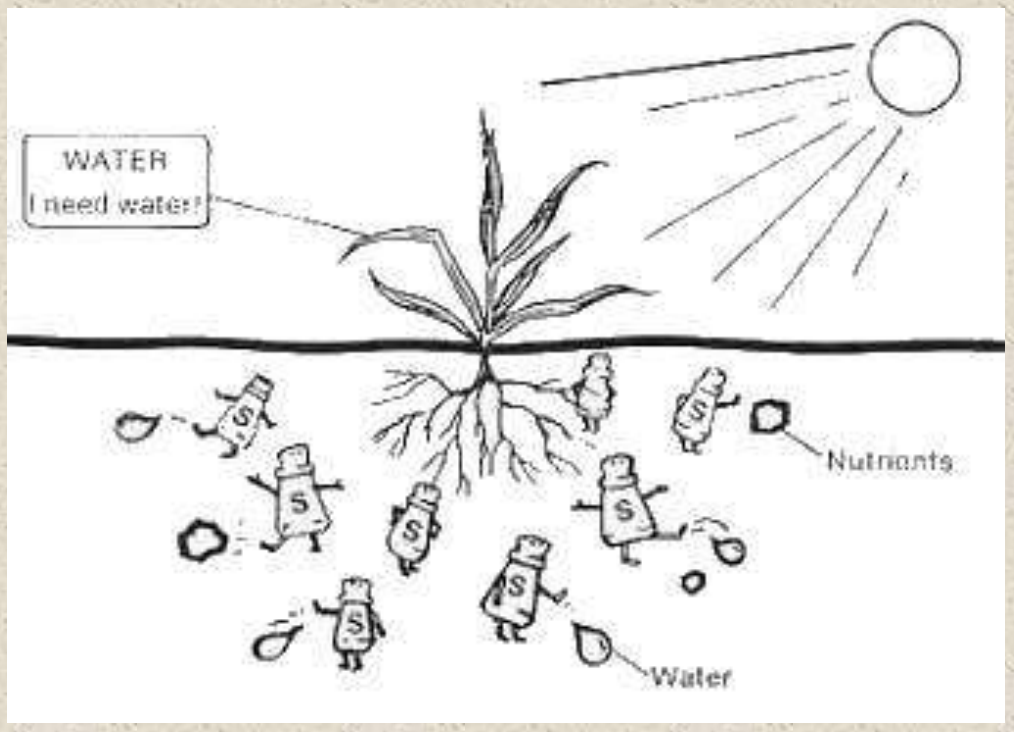


SALTS



Why do plants not grow in salts

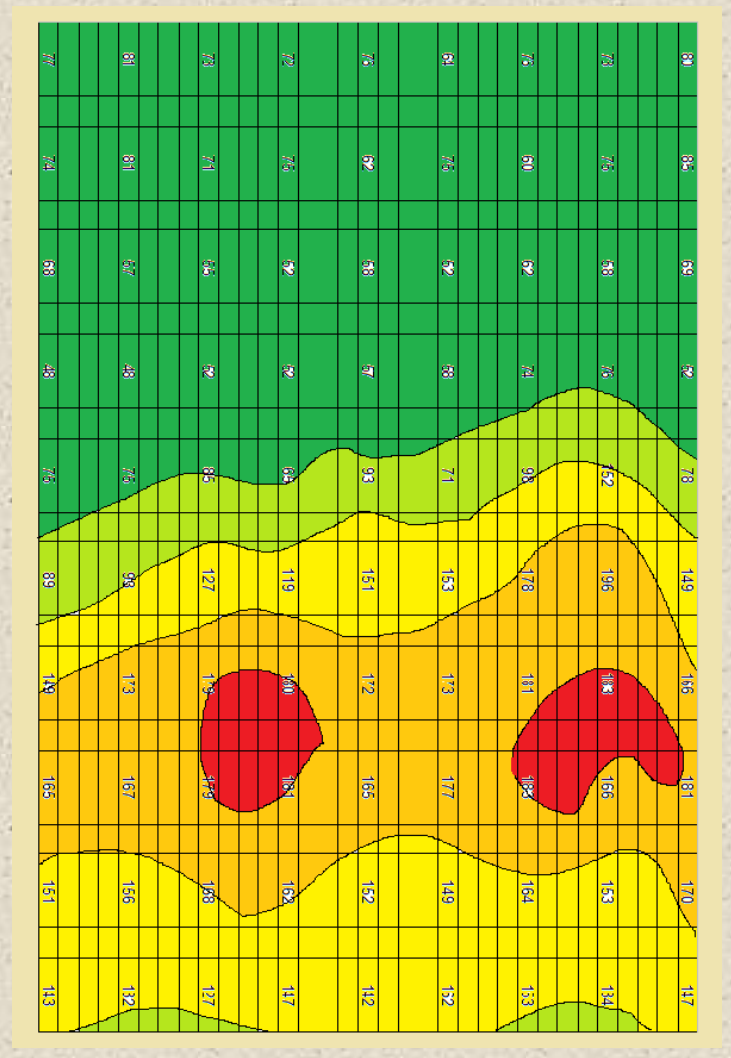
There is often lots of moisture and nutrients in saline seeps, however, the plants are unable to utilize them and starve.



How did we set up the demonstration

- Develop a relative salinity contour map of the study area using an EM 38 to measure soil conductivity.
- Canola varieties, a canola quality mustard, and Harrington barley were be seeded in strips down the saline gradient ranging from non-saline areas to relatively high saline areas.

EM 38 Salinity Map



EC Readings

Dark Green < 80 (Non-Saline)

Light Green 80-100 (Low Salinity)

Yellow 100-130 (Low to Moderate)

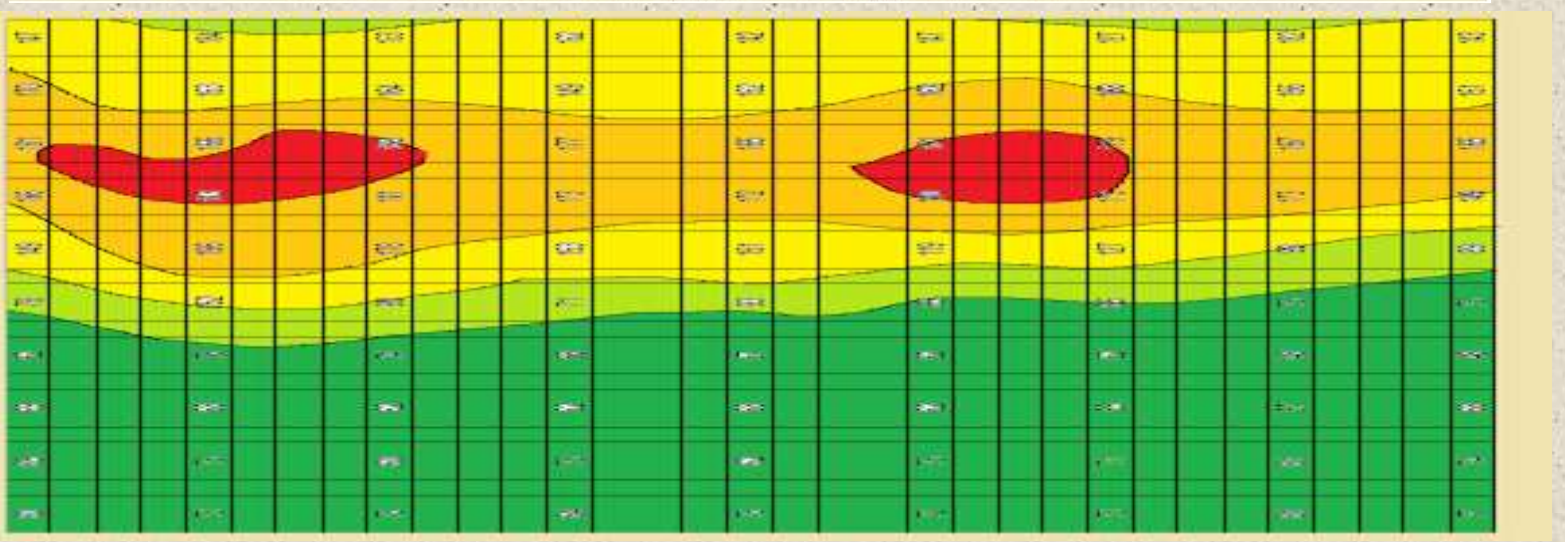
Dark Yellow 130-160 (Moderate to High)

Red >160 (Relatively High Salinity)

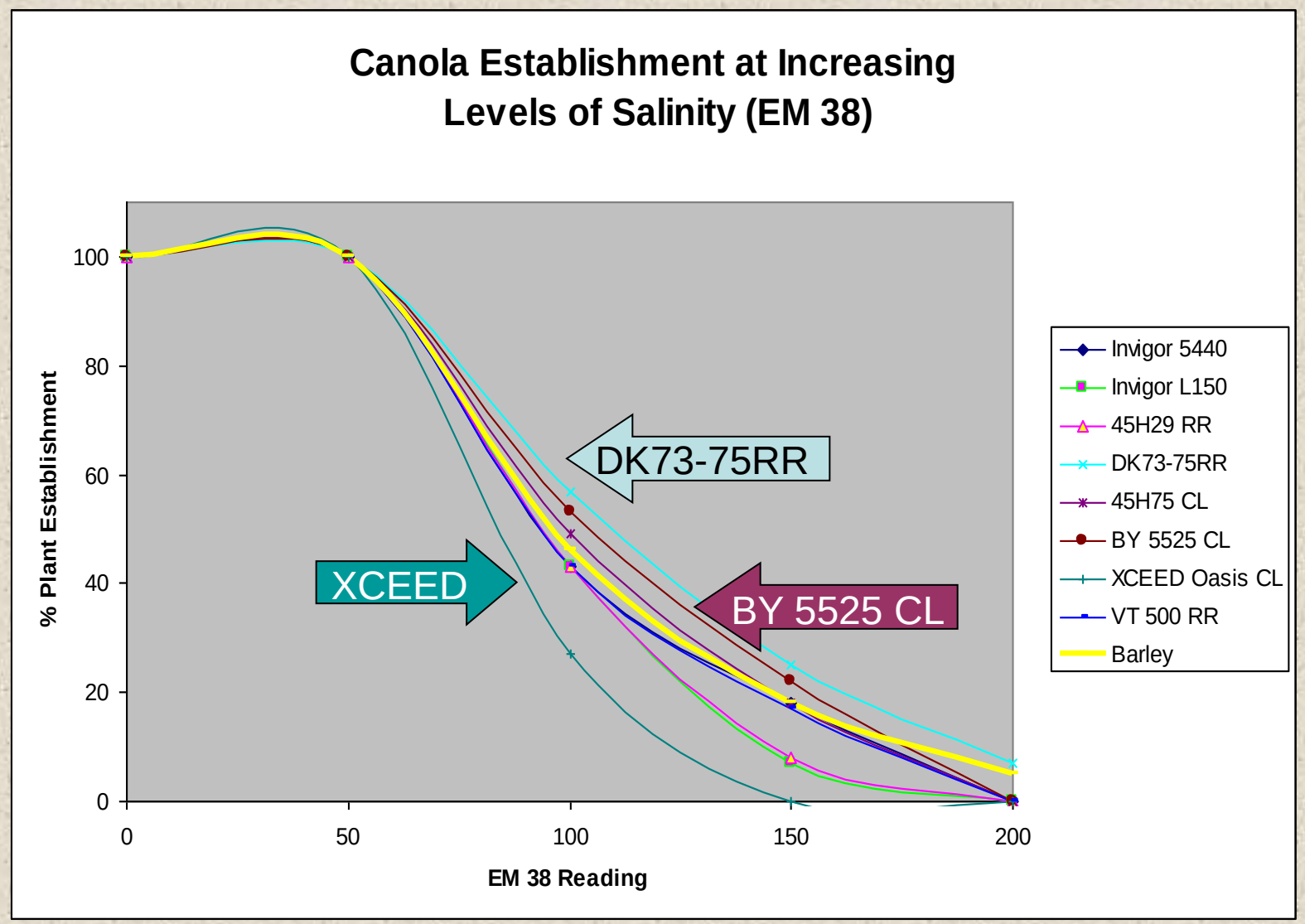
Demo Design: Crops

- 1. Invigor 5440 LL
- 2. Invigor L150
- 3. 45H29 RR
- 4. DK73-75RR
- 5. 45H75 CL
- 6. BY 5525 CL
- 7. XCEED Oasis CL (B. Juncea)
- 8. VT 500
- 9. Harrington Barley (Check)

Pictures



Demo Observations



Pictures (9 treatments)

- 9. Harrington Barley (Check) 73 XC 5006 BY 4512 ... 1505440 LL

Move from the field into the AAFC Salt Lab

These demonstrations are often not replicated and with the level of soil variability within a saline site it is difficult to come up with concrete data in the field.

Look at results from Dr. Harold Steppuhn comparing Harrington barley to Hybrid canola

Salt Lab AAFC Swift Current, SK

Plants grown in a silica sand media and irrigated with a solution of equal nutrients and various salt concentrations.

Six levels of salinity (EC 1.6 – 27 dS m^{-1})

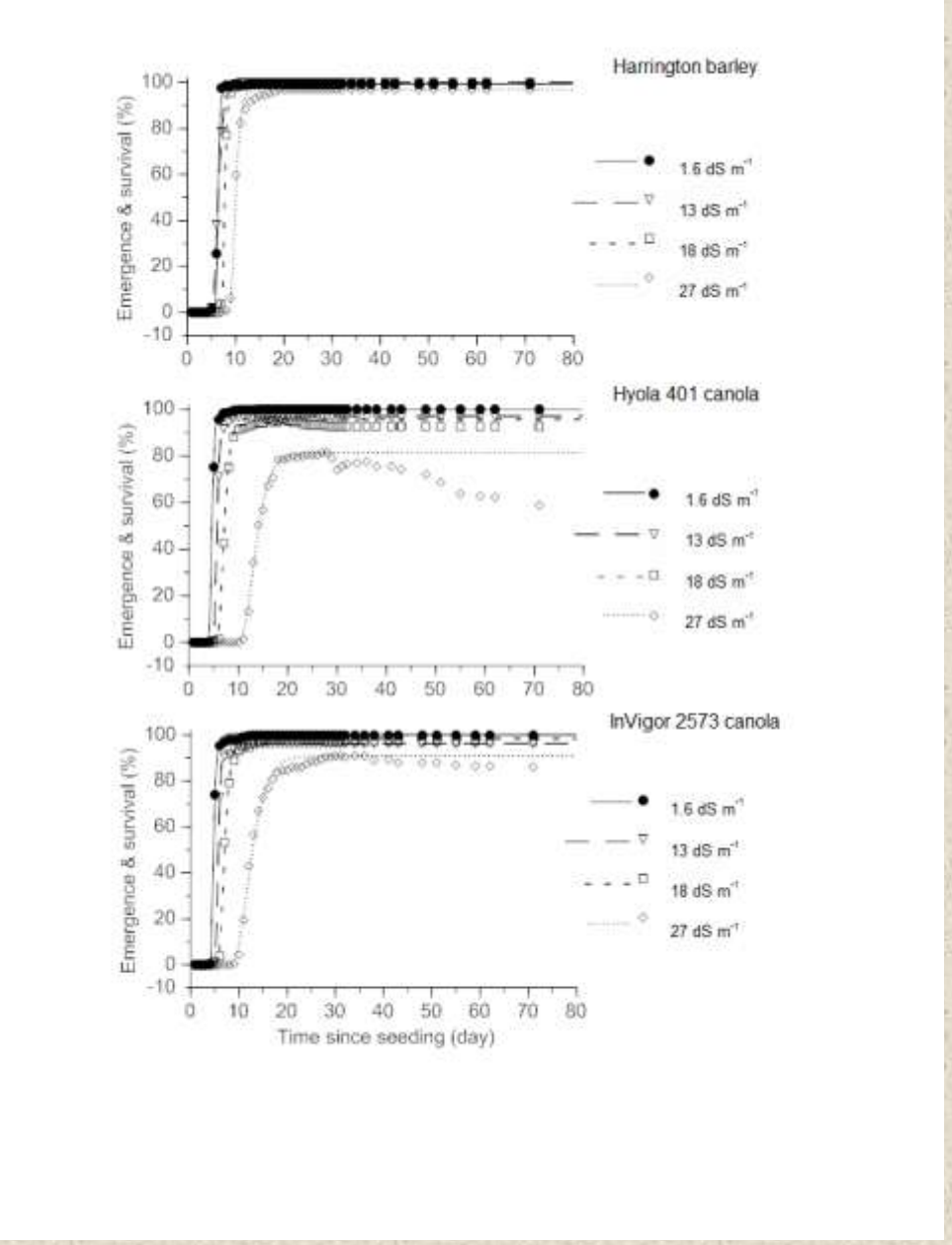
Measurements include emergence and survival, yield.

Salt Lab

Plant emergence is delayed as saline levels increase.

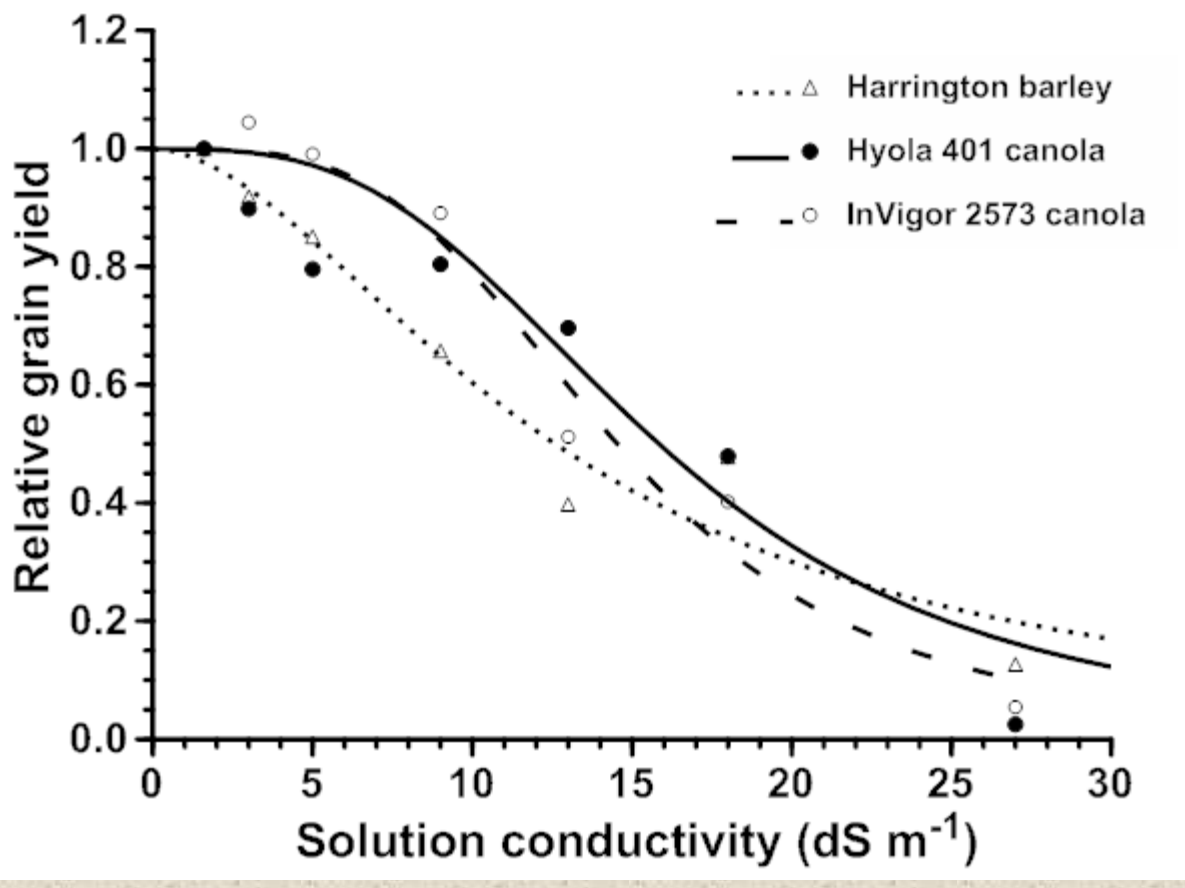
Plant stand density decreases as saline levels increase.

As a result, plant maturity is delayed as saline levels increase.



Plant Maturity Delayed

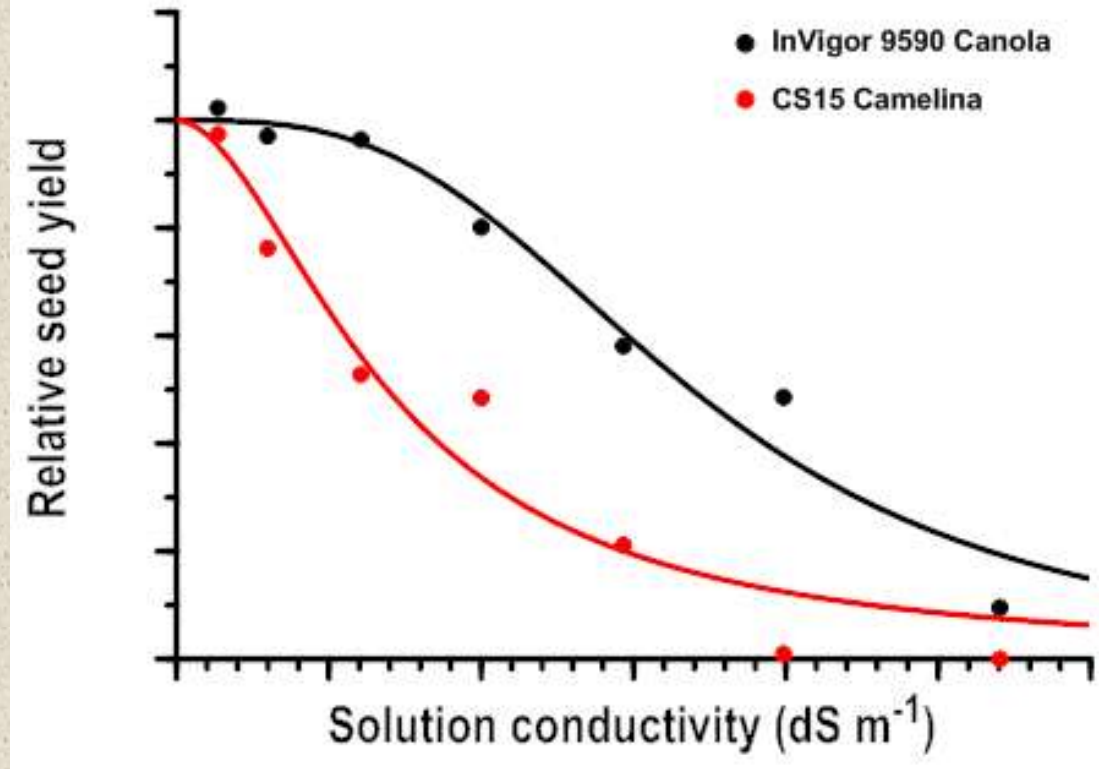
Salt Lab AAFC Swift Current, SK



Salt Lab

Not all Brassicas react the same.

Camelina does not appear to tolerate saline soils as well as some Hybrid canolas.



Summary / Conclusion

It appears from our demonstration and from results in AAFC Salt lab that some Hybrid canolas have similar salinity tolerances to that of barley.

Hybrid canola can produce similar grain yields to that of Harrington barley provided the plant stand in the saline seedbed can maintain an acceptable plant density. Such densities might be assured by increased seeding rates in saline areas.

Producers should be able to rotate from barley to canola crops in saline areas without sacrificing grain yield providing economic and rotational benefits.

Acknowledgement

- ADOPT & Sask. Ministry of Agriculture
- Dr. Harold Steppuhn & AAFC Salt Lab
- WCA Staff.

2013 Cropportunities Conference , March 12

2013 Wheatland Annual Tour July 11, 2013

www.wheatlandconservation.ca

Improved Straight Cutting Techniques in Oilseeds

- Can we reduce harvest losses enough to straight cut Argentine canola?

Three headers

-BISO header extension.

-Draper header.

-Rigid straight cut header.

BISO Header Extension

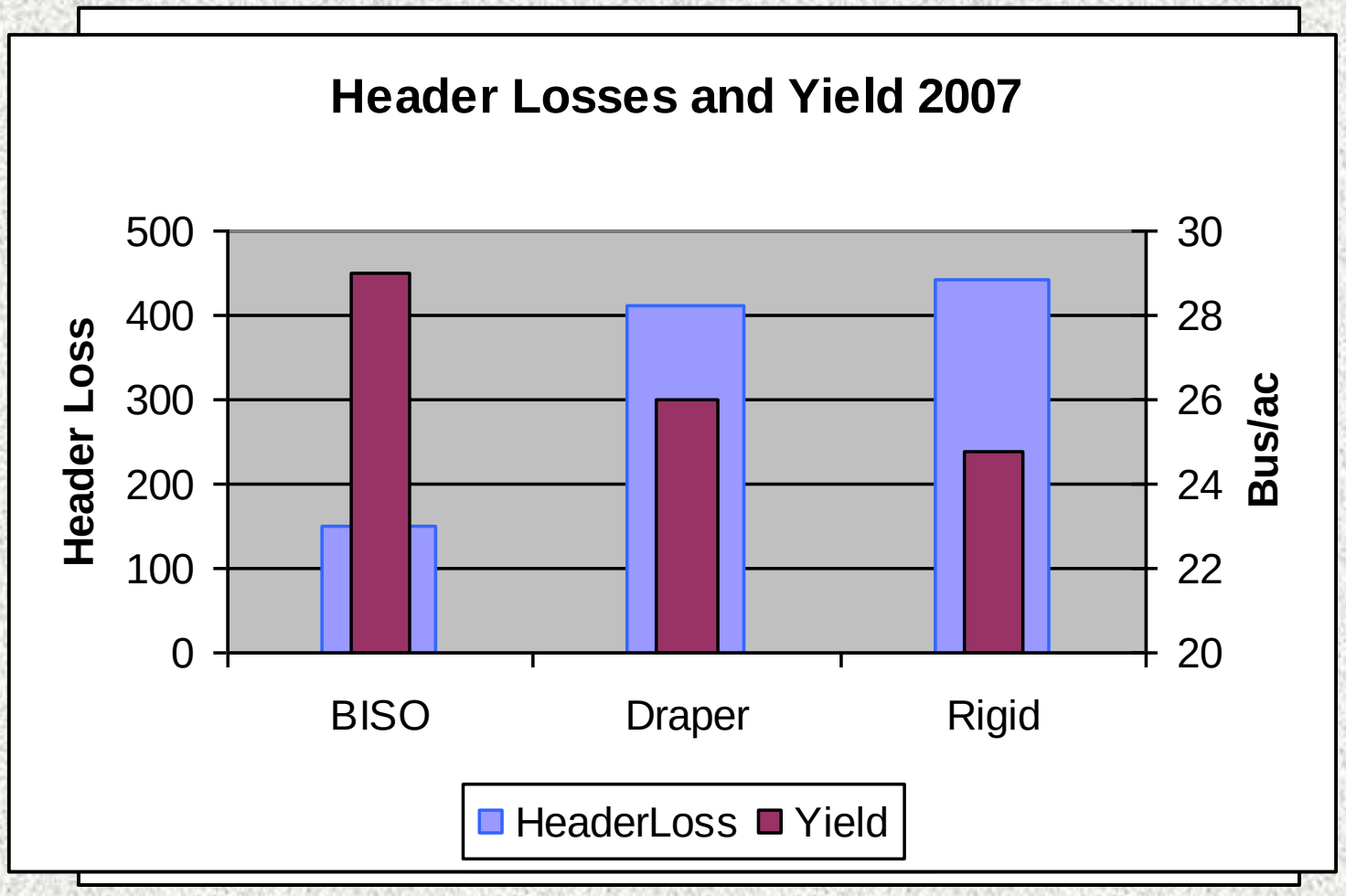
Header from Robert Breckner, Grandview, Manitoba

BISO Header Extension

- Reel above plate
- Cutter bar forward
- Crop has no problem feeding
- Seeds caught by ridged plate

Seed trapped on terraced plate

Draper Header Results ’06, ‘07



Thank-you!

2013 Cropportunities Conference , March 12

2013 Wheatland Annual Tour July 11, 2013

www.wheatlandconservation.ca