American Crystal Sugar Company

Stand Establishment with Fertility and Residue Management

Your Way to Grow 2020

American Crystal Sugar Company

Stand Establishment with Fertility and Residue Management

Allied Industries 2020

Sugarbeet Stand Establishment

- Gold Standard

← Poor stand
vs
good stand →

Seed Spacing

- Sets Target Plant Population
  - 170-210 plants per 100 feet
  - Above 240 consider thinning

- Seed Spacing
  - 4.5” – 5”

- Popular Seed Spacings 5 Year Summary

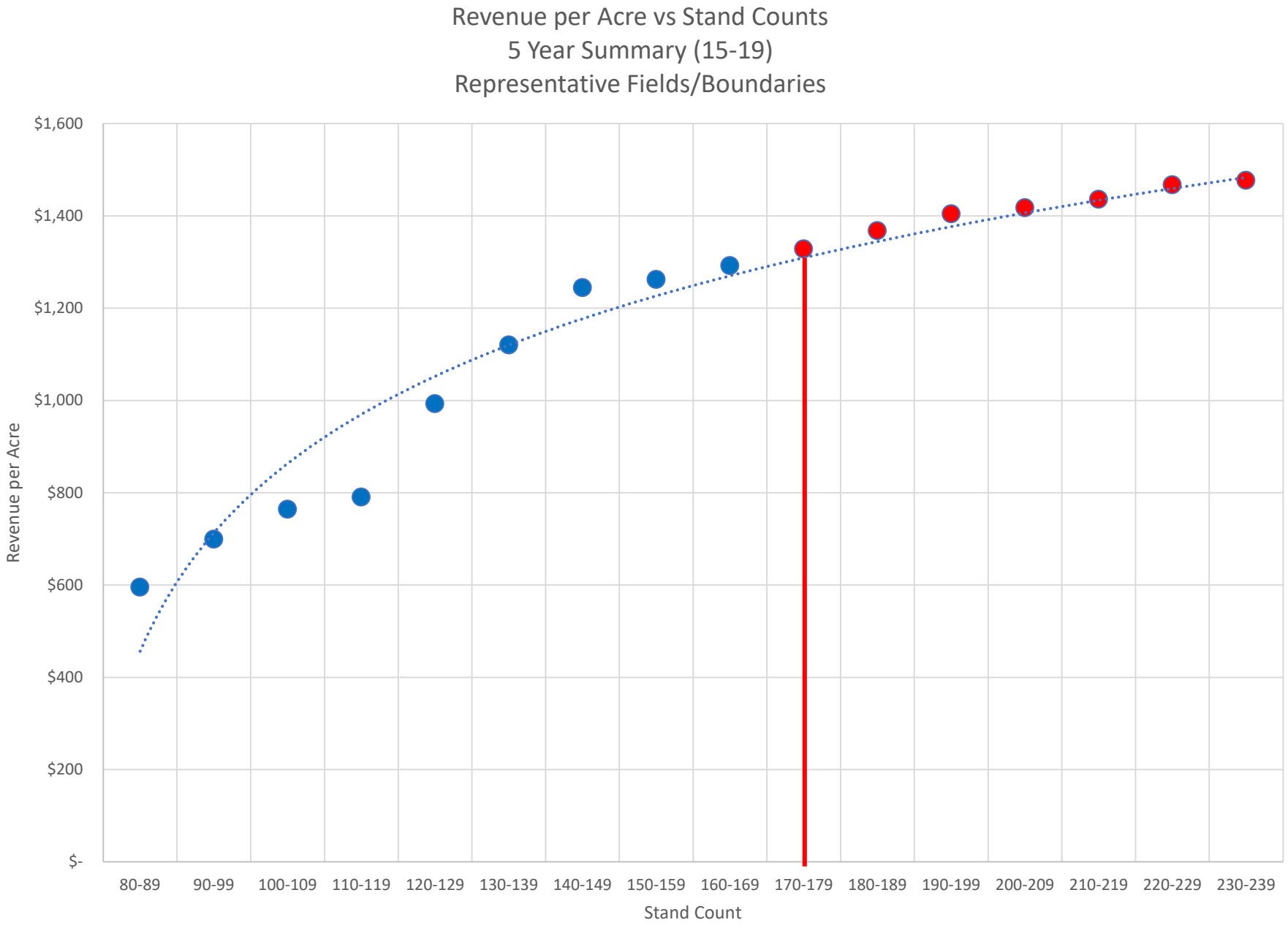
  4.70 - 4.79” – 32.7% of acres

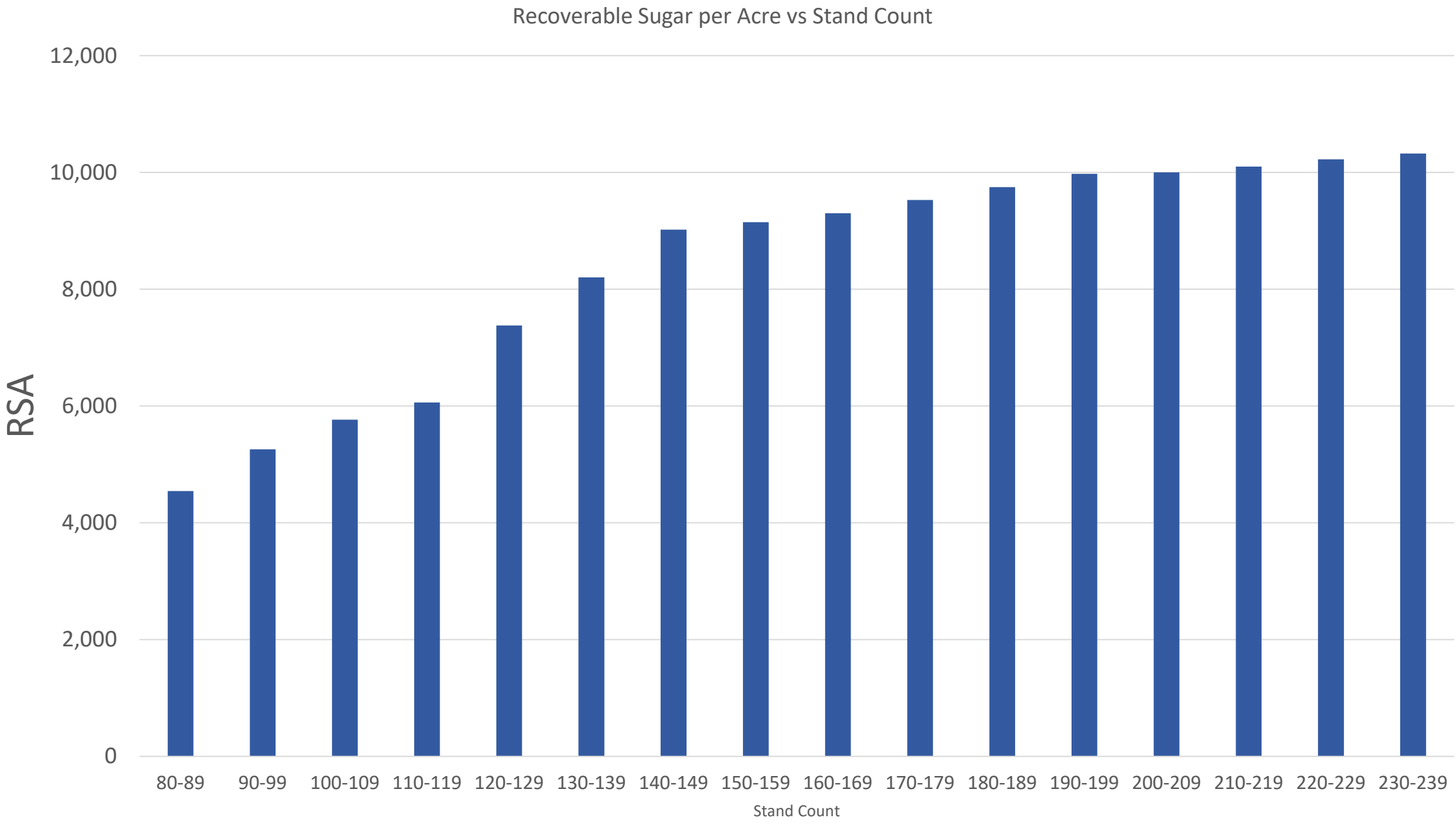
  4.80 - 4.89” – 21.9% of acres

  5.0 - 5.09” – 16.2% of acres

  4.50 - 4.59” – 15.3% of acres

Good Seed Spacing


Revenue per Acre vs Stand Counts
5 Year Summary (15-19)
Representative Fields/Boundaries
$1,600
$1,400
$1,200
$1,000
$800
$600
$400
$200
$-
Revenue per Acre
80-89
90-99
100-109
110-119
120-129
130-139
140-149
150-159
160-169
170-179
180-189
190-199
200-209
210-219
220-229
230-239
Stand Count


Recoverable Sugar per Acre vs Stand Count
12,000
10,000
8,000
6,000
4,000
2,000
0
RSA
80-89
90-99
100-109
110-119
120-129
130-139
140-149
150-159
160-169
170-179
180-189
190-199
200-209
210-219
220-229
230-239
Stand Count

Seedbed Prep

- Minimum Spring Tillage
  - Work soil as shallow as possible
  - Pack soil to have a firm seedbed
- Don’t work ground if too wet

- Reduce Residue
  - Trash sweeps on planters can help

- Avoid working too far ahead

- Stale Seedbed

You only get one chance, have patience, do it right

Planting Depth

- Seeding Depth .75 to 1.25 inches deep
  - Shallower planting depth for earlier seeding
- Can depend on soil moisture
  - Want to avoid compaction or open trenches
  - Have planter set correctly
  - Don’t chase moisture too deep

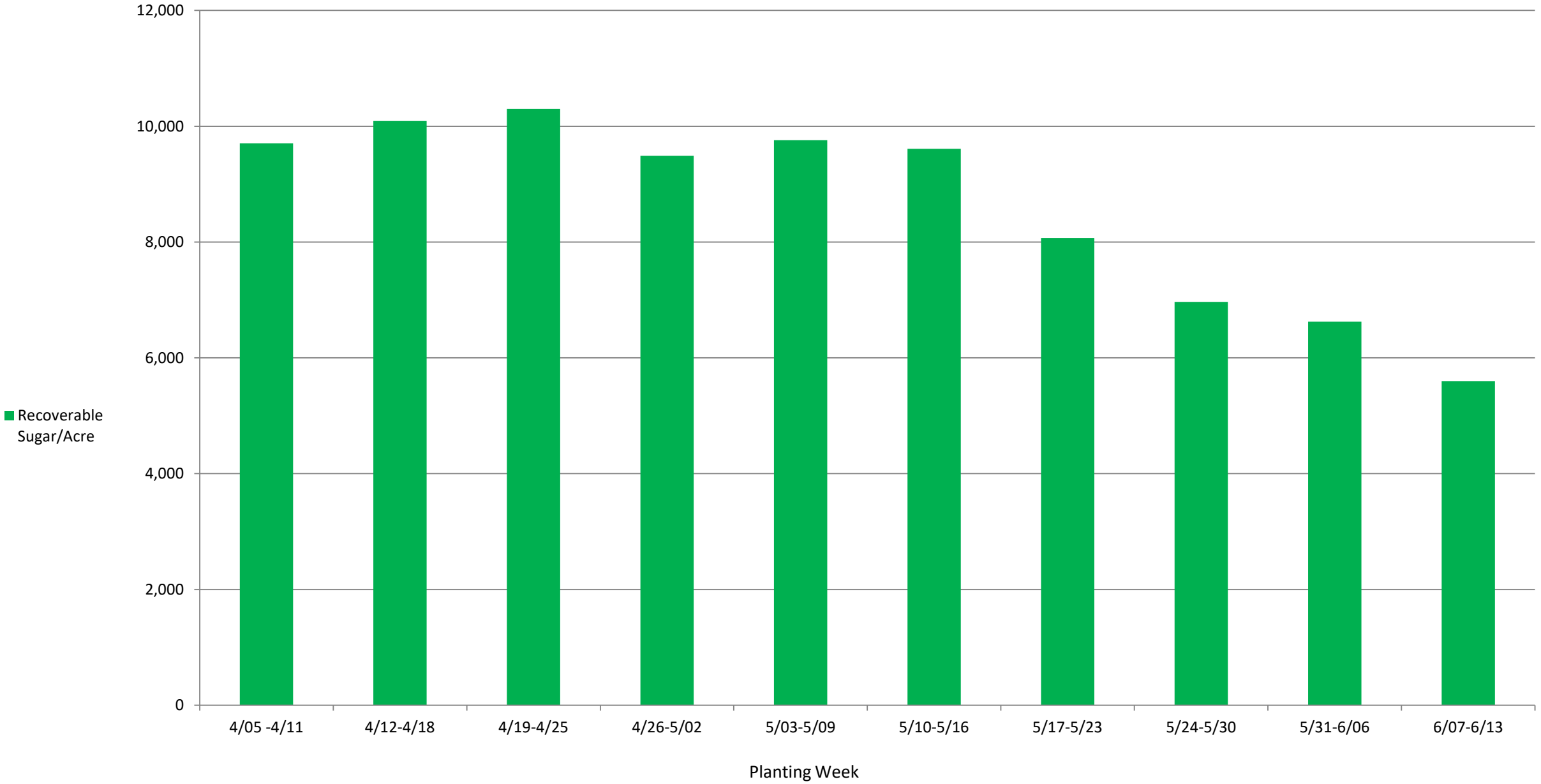
Open Seed Trench

Gold Standard Stand Establishment Practices

- Starter Fertilizer
- Fungicide & Insecticide
- Cover Crop
- Planter Condition
- Patience with Weather

Barley Cover Crop

Recoverable Sugar/Acre by Planting Week
ACSC 5 Year Average



Spring 2020 Considerations

- How much field work is needed?
- Residue Management
- Late Spring
- Flooded Ground

Sugarbeet Fertility Management

- Gold Standard

Fertility Levels

- **Nitrogen**
  - 130 lbs/acre at 4 foot test
    - Available + Applied
  - 100 lbs/acre at 2 foot test
    - Available + Applied
- **65lbs/acre at minimum in 0-2 feet**
- Reduce Nitrogen in late planting situations

Fertility Levels

- **Phosphorus**

  Olsen Test ppm

  16+ Apply no P fertilizer

  8-16 Use 3gpa 10-34-0 in-furrow or recommended broadcast P rate

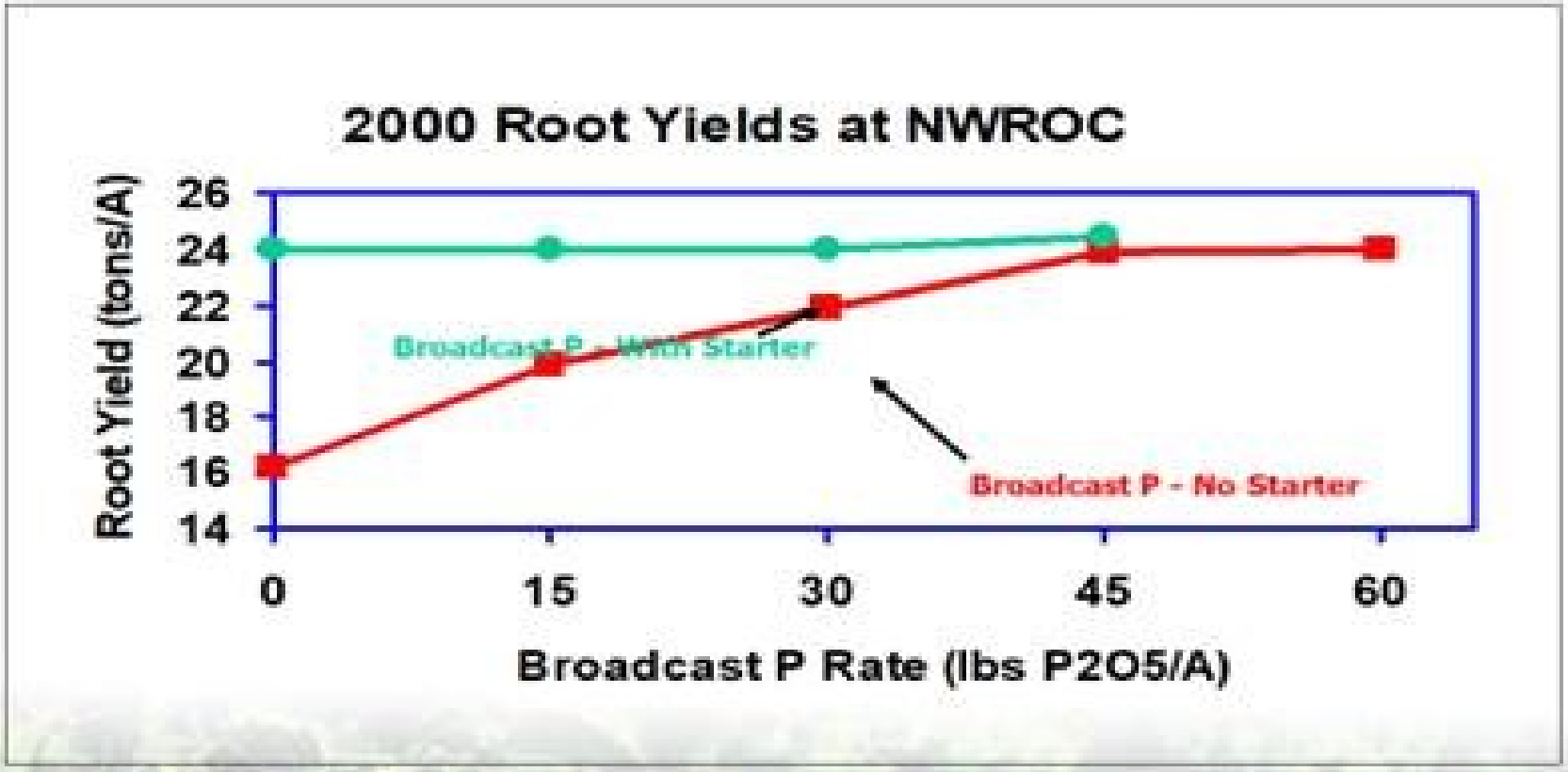
  <8 Use 3gpa 10-34-0 in-furrow and 40lb P_2O_5 broadcast

- Use Phosphorus based starter for better efficiency
  - 3 gal 10-34-0 = 45lbs P_2O_5 broadcast

Starter Fertilizer Plug-up

More on Starters

It's Not the "N" - It's the "P".



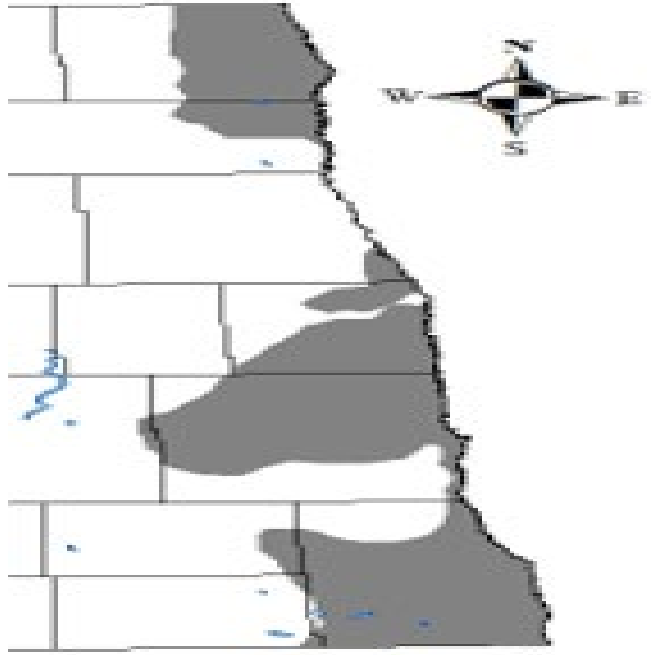
Dr. Al Sims and Dr. Larry Smith - University of Minnesota - Crookston

Fertility Levels

- **Potassium**

- Clay types can affect Potassium recommendations
  - Smectite – 150ppm
  - Illite - 120ppm

- ND 1 refers to soil with Smectite/Illite Ratio < 3.5 – white areas on the map
- ND 2 refers to soil with Smectite/Illite Ratio < 3.5 – gray areas on the map
- For Potassium in MN use the MN Line



Dave Franzen NDSU

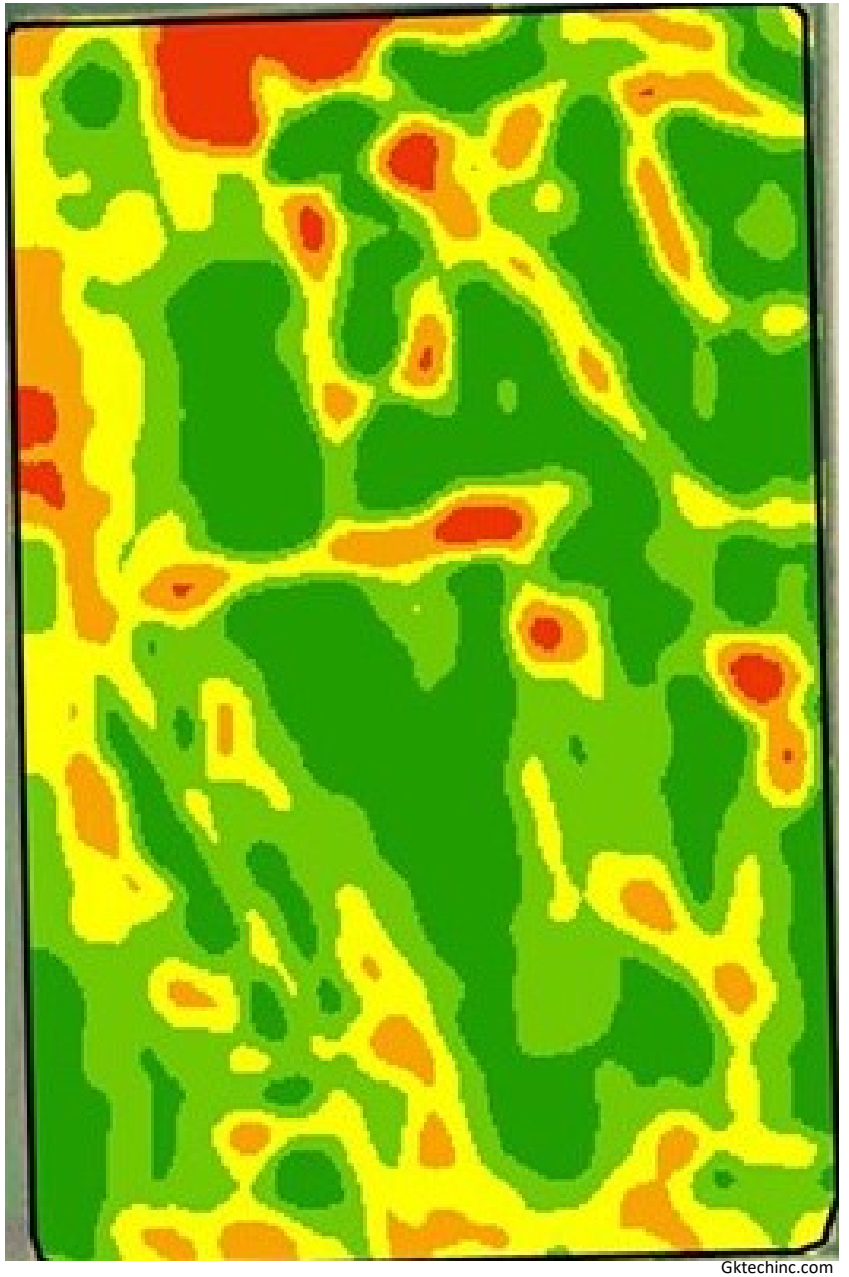
Red River Valley Map of Smectite vs Illite ratios

Potassium Soil Test, ppm					
	VL	L	M	H	VH
	0-40	41-80	81-120	121-150	150+
	-- K Application Rates (lbs/ac) --				
MN †	110	80	50	0	0
ND 1	120	90	50	0	0
ND 2	120	120	90	60	0

Potassium Recs Sugarbeet Production Guide

Zone Sampling & Application

- Prevents overapplication using Precision Ag Technology
  - VRT application may reduce total N applied, but not always.
  - VRT Places N where its needed, not too much in some areas and not too little in others
- 50% of Crystals acres are zone sampled and variable rate spread.



Variable Rate Fertilizer Map

Prepile Fertility Considerations

- Plan ahead
  - Consider varieties planted
  - Field accessibility
    - Poor crossings or heavy ground
- Reducing Nitrogen application
  - Can adjust entire field
  - Or headlands and strikeouts

2020 Fertility Management Considerations

- Spring Applied Fertilizer
- Can’t get Field Soil tested
- Can’t get field spread before planting

Wet Fall Conditions

Managing Unharvested beets

Managing unharvested Beets

- Because of unprecedented harvest difficulties due to wet conditions this year, many acres were not able to be harvested.
- When sugarbeets are left unharvested potential management considerations should be taken for crop production on those fields in 2020.

General Considerations on Unharvested Acres

- Defoliate beets if ground can support the topper. (FALL)
- Defoliating/shredding will accelerate the release of nitrogen for the subsequent crop.
- Leaving roots intact in the ground provides the highest potential for root deterioration.

Past Experiences With Tillage

- Tillage will lift the sugarbeet root out of the ground and deposit the root nearly entirely whole on the soil surface.
- Multiple passes would be required to incorporate, increasing fuel and labor costs.
- The root not being surrounded by soil greatly increases the time to decay creating a dry carcass.
- This becomes a nuisance for the next crop in rotation.

Fertility Management On Unharvested Acres

Nitrogen

- Defoliation of tops will accelerate release of N for subsequent crops. (FALL)
- N in the sugarbeet tops will be available very early in the spring of 2020.
- Spring soil testing will be better than fall testing.
- Sample areas where beets were not harvested separately from rest of the field. (nutrient differences are likely to occur)

Fertility Management Cont.

Nitrogen

- An Additional 30-50lbs/acre N will be needed for all non-legume crops.
- Planting Soybeans will help avoid N management concerns in 2020.
- Apply N as close to planting as possible to reduce N immobilization as beets decompose.
- Banded N for row crops will be more effective than broadcast N.
- Side dress part of the N after emergence to maximize N use efficiency. (corn)

Fertility Management Cont.

Phosphorus

- Phosphorus deficiency might occur on fields testing low for P.
- Use past P soil test data on unharvested acres to fertilize for 2020.
- Consider applying additional P fertilizer for crops with high demand like soybeans.
- Banded application in the spring will be most effective.
- Sulfur deficiency is not likely but might occur early in the spring but should disappear as crops root into subsoil sulfur supplies.

Fertility Management Cont.

Potassium

- Leaving sugarbeet roots and tops shouldn't alter the content of available K in the soil
- No additional K fertilizer should be required
- Follow normal soil test recommendations

Diseases

- If unharvested areas had root disease present, these areas are likely to have increased inoculum levels in that part of the field for future beet crops.
- Plant small grains to reduce disease inoculum buildup on unharvested acres.
- Aphanomyces history: next time plant a highly tolerant variety and use tachigaren up to 45 grams.
- Rhizoctonia history: consider planting small grains in 2020

instead of beans, corn, or potato that build up rhizoctonia inoculum.

Crops To Consider on Unharvested Acres

- Soybean – 1st choice
  - Soybeans are a legume and will use nitrogen available or make its own supply making them the best choice for N management and lowering N input costs.
  - Consider increasing plant populations by 10% if seedbeds are poor.
- Edible beans – 2nd choice
  - Edible beans are a legume and will use nitrogen available or make its own supply making them another good choice for Nitrogen management and lowering nitrogen input costs.
  - Consider increasing plant populations by 10% if seedbeds are poor.

Crops To Consider on Unharvested Acres

- Small grains – 3rd choice
  - Small grains will need an extra 30 - 40 lbs. of actual N added per acre to offset soil N tied up in soil by the extra sugarbeet organic matter.
- Corn – 4th choice
  - Corn following sugarbeets can experience "fallow syndrome" requiring higher amounts of Phosphorous starter fertilizer, 10 gal/a 10-34-0 is the high limit to be placed in-furrow.
  - Corn will need an extra 30-50 lbs. of actual nitrogen.
  - A population increase of 10% is recommended for poor seedbeds conditions.

Questions ?