

# **Micronutrients for Irrigated Crops – Are They Necessary?**



# Are Micronutrient Needs for Irrigated Crops Different from Dryland Crops?

**In some aspects yes, in others no!**

- ***Yes, when “specialty crops” are considered.***
- ***No, when “dryland” crops are grown under irrigation.***

# **Anything “Peculiar” about “Irrigated” Crops?**

**Nutrient content in irrigation  
water – example, B and Fe (same  
as it is for S)**

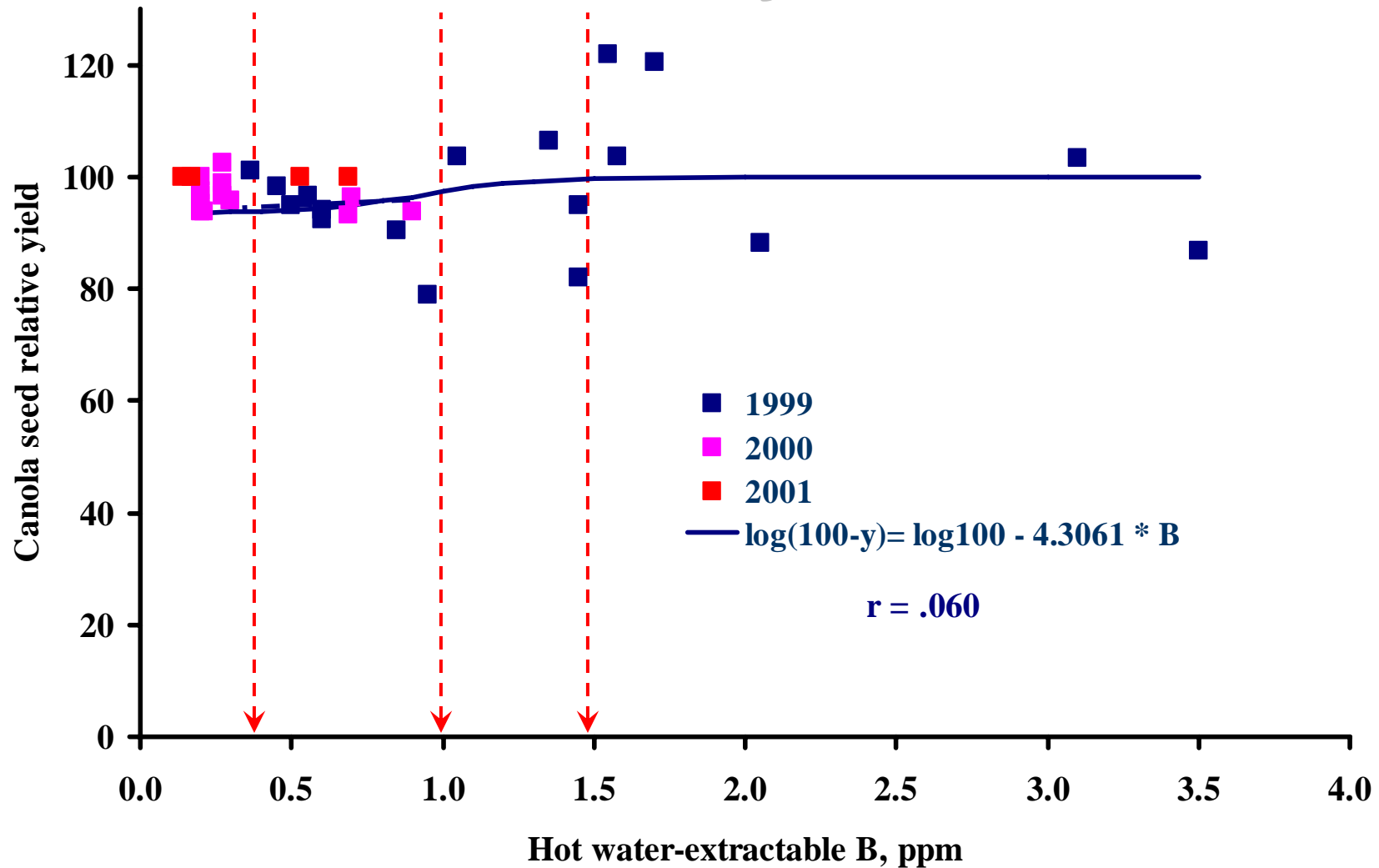
# Are Criteria, e.g., “Critical Levels” Different for Irrigated Crops ?

**No!**

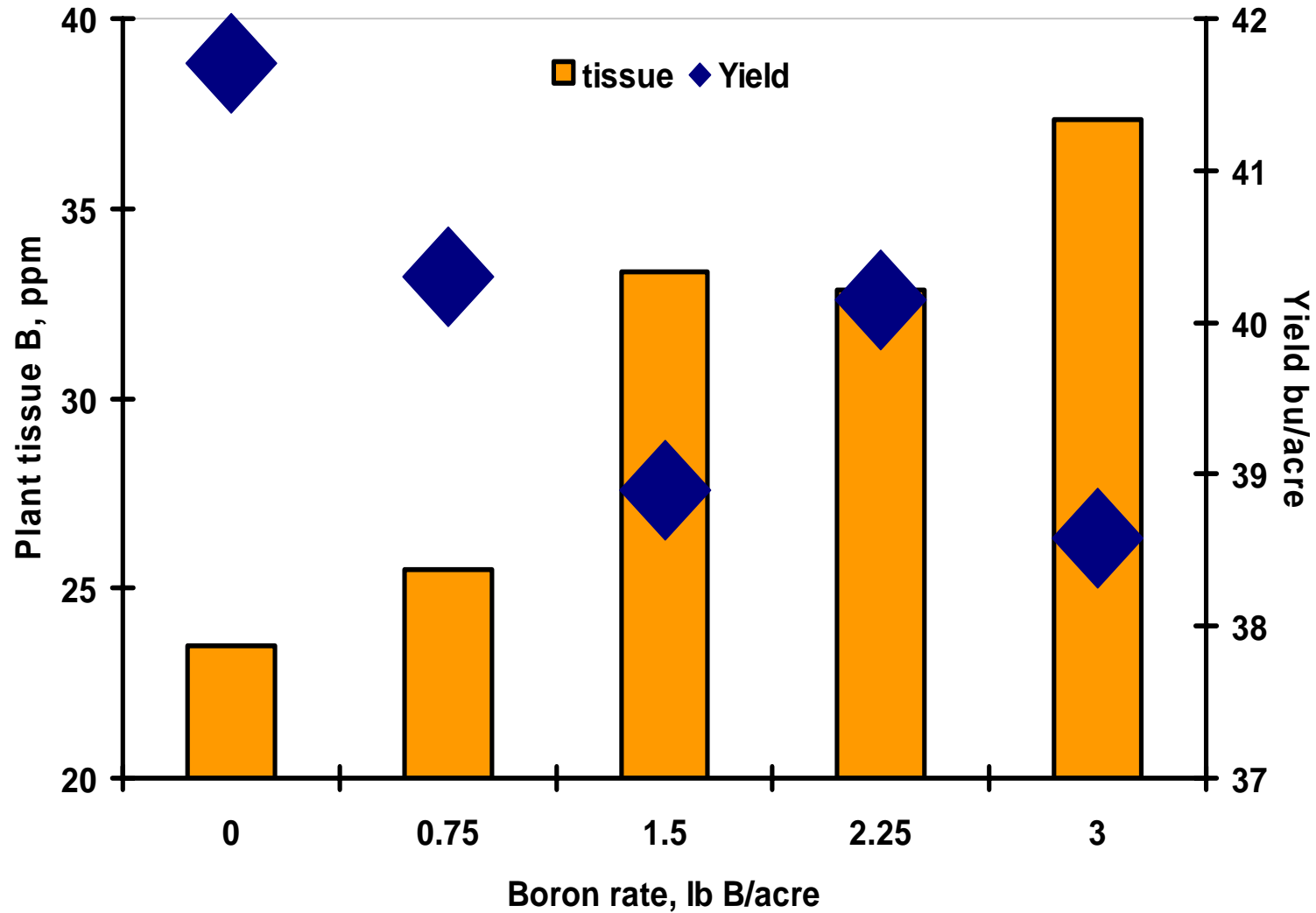
# Boron



# Interpretation of Soil Tests w. Canada 40 sites; yield 18-63 bu/ac



# Tissue B and yield (high yield)



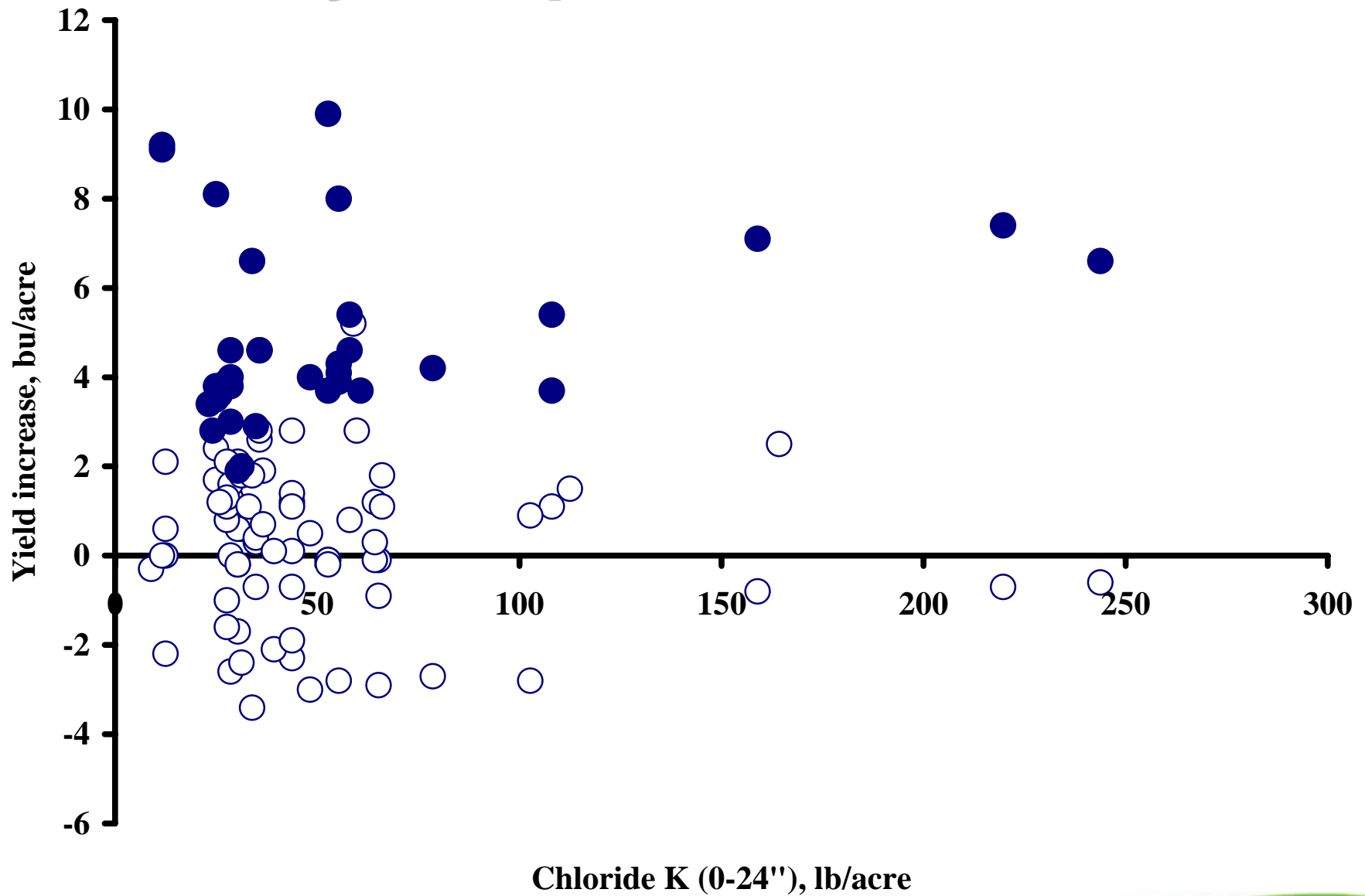
**When Should Boron be  
Used?  
Just as well forget about it!**



# Chloride



# Barley Response to Chloride



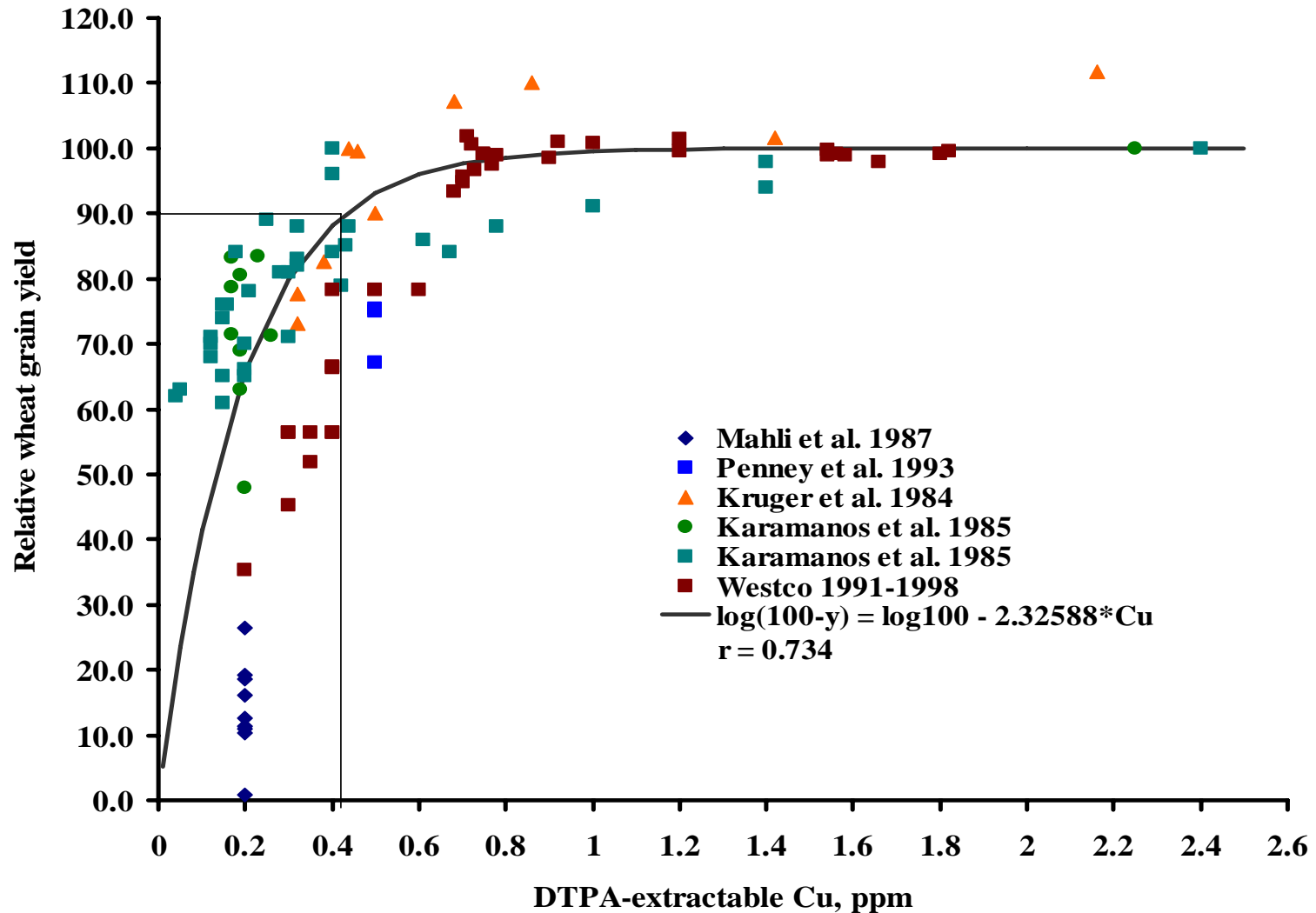
# Copper



# Copper Soil Criteria

- **Criteria were developed in 1980-85**
  - **Manitoba 0.2 ppm**
  - **Saskatchewan 0.4 ppm**
  - **Alberta 0.6 ppm**
  - **DTPA extraction**
- **But most of marketing/selling is happening between 0.4 and 2.5 ppm!**

# Interpretation of Soil Tests



# Interpretation of Soil Tests for Copper

- **Based on 102 tests with spring wheat in western Canada**
  - **Deficient < 0.4 ppm (52 tests):**
    - Average Cu test  $0.24 \pm 0.09$  ppm
    - 94% probability of obtaining an agronomic response
    - 62% probability of obtaining an economic response
  - **Marginal 0.4 – 0.6 ppm (50 tests)**
    - Average Cu test  $0.68 \pm 0.24$  ppm
    - 16% probability of obtaining an agronomic response
    - 2% probability of obtaining an economic response

**When Should Copper  
be Used?  
With Cereals on SANDY  
Soils with <0.4 ppm  
DTPA-extractable Cu**



# Manganese



# Manganese

- Responses on organic soils only
- No documented responses mineral soils

**No need for Manganese  
(sugar beets?)**

# Iron and Molybdenum Identification

- **NO research in western Canada on these micronutrients**
- **Anecdotal information for garden soils**
- **Cu/Mo in pastures**

# Zinc



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# Zinc Identification

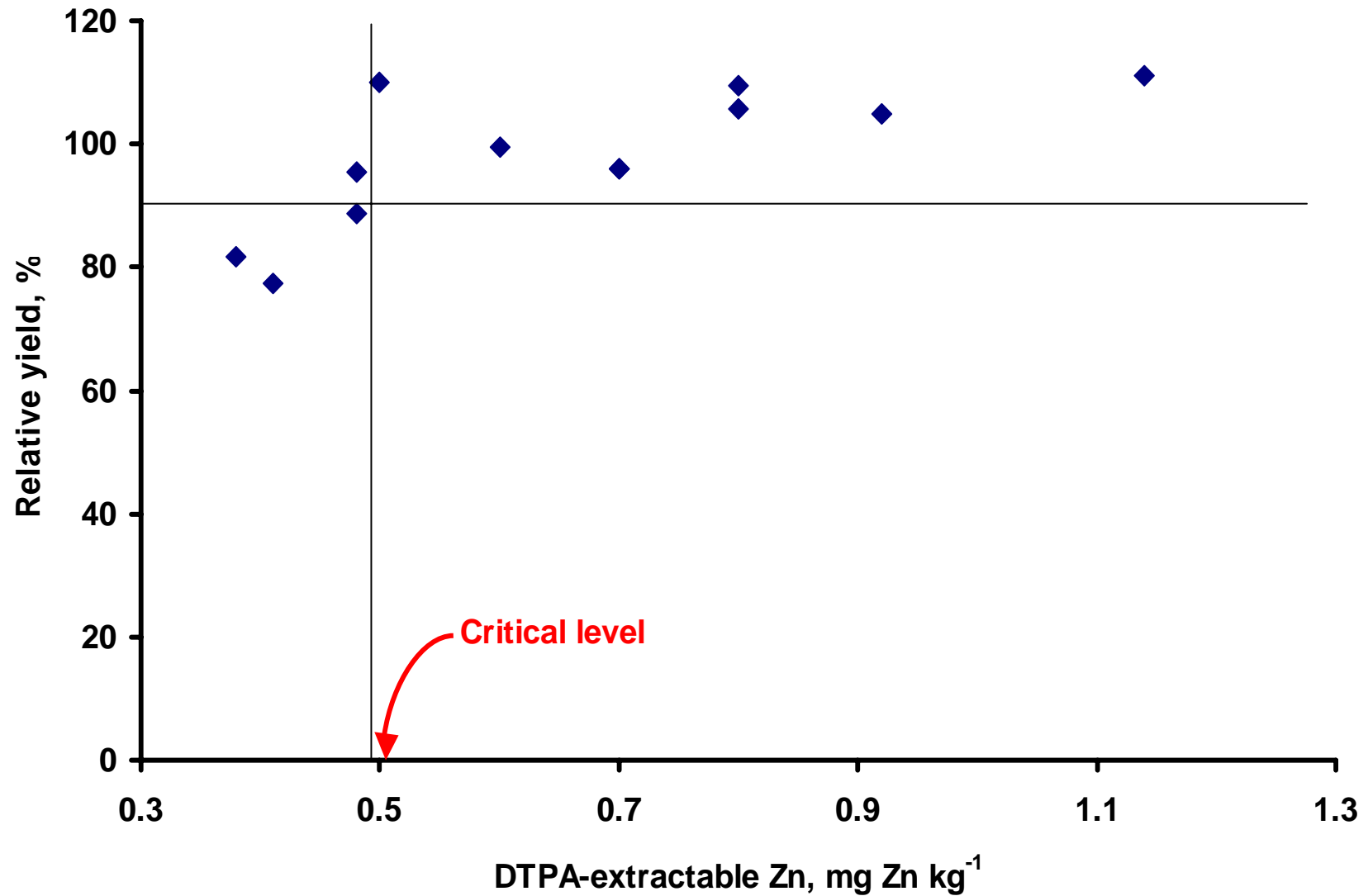
- **Extensive database in western Canada**
- **NO RESPONSES with cereals and oilseeds**
- **Responses with corn and beans**

# Soil Criteria

<b>Nutrient</b>	<b>Method of Extraction</b>	<b>Crops</b>	<b>Critical level, ppm</b>	<b>Comments</b>
<b>Zinc</b>	<b>DTPA<sup>1</sup></b>	<b>Cereals</b>	<b>&lt;0.25</b>	<b>Marginal</b>
		<b>Corn</b>	<b>&lt;0.5-1</b>	<b>Deficient</b>
		<b>Beans</b>		

<sup>1</sup>Inappropriate method of assessment?

# Soil test critical level for beans

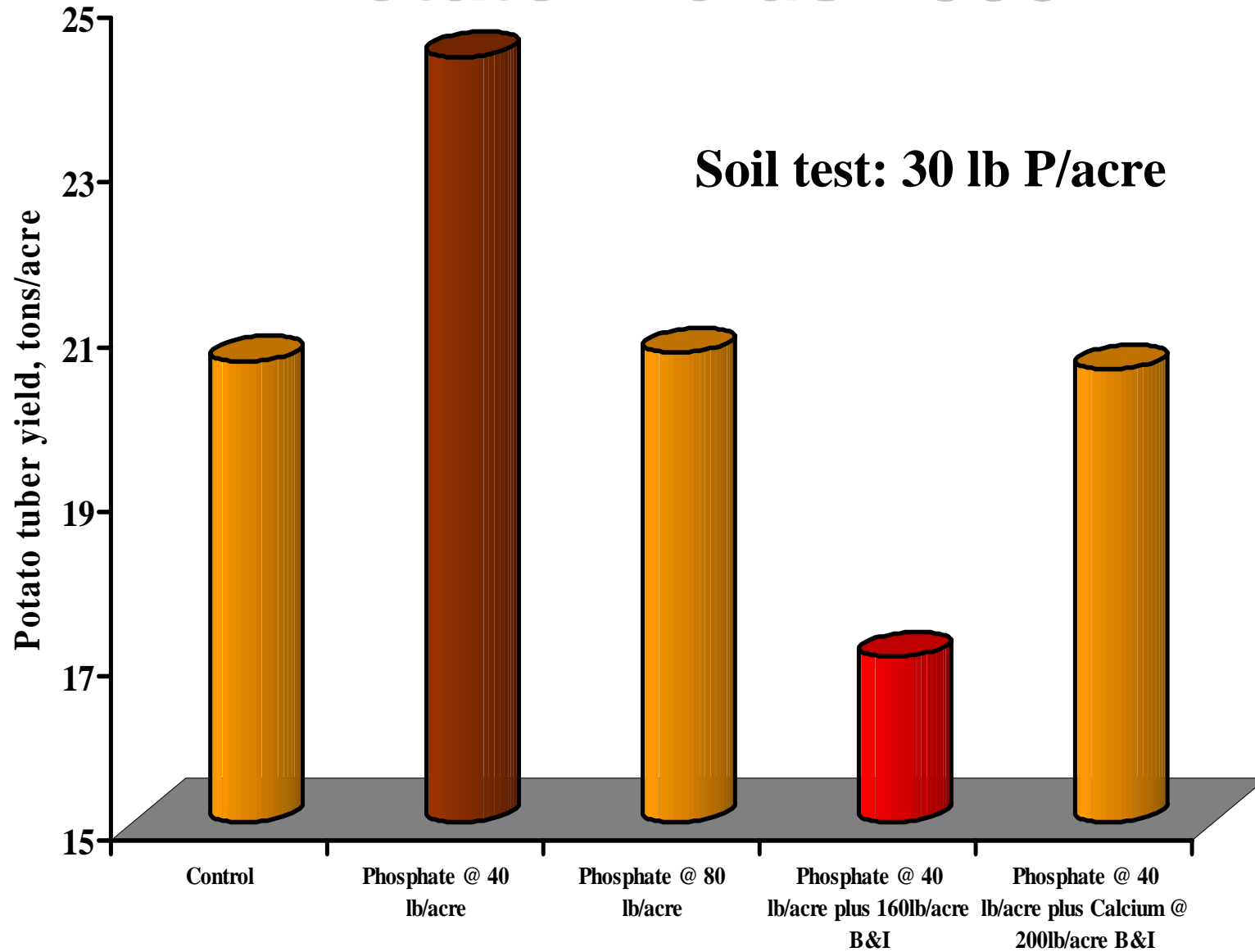


**When Should Zinc be  
Used?**

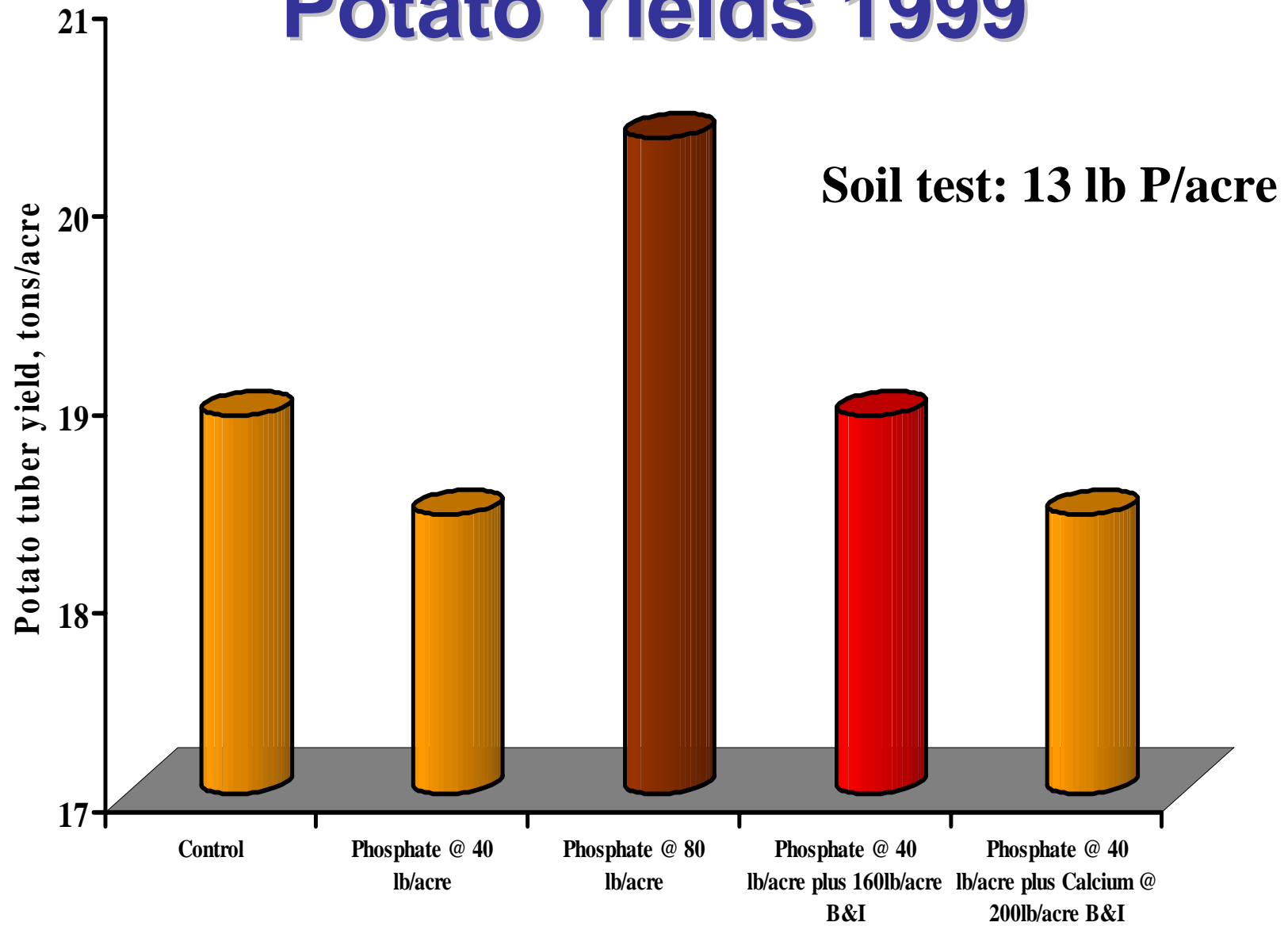
**With Corn and Beans  
Potatoes?**



# Potato Yields 1999

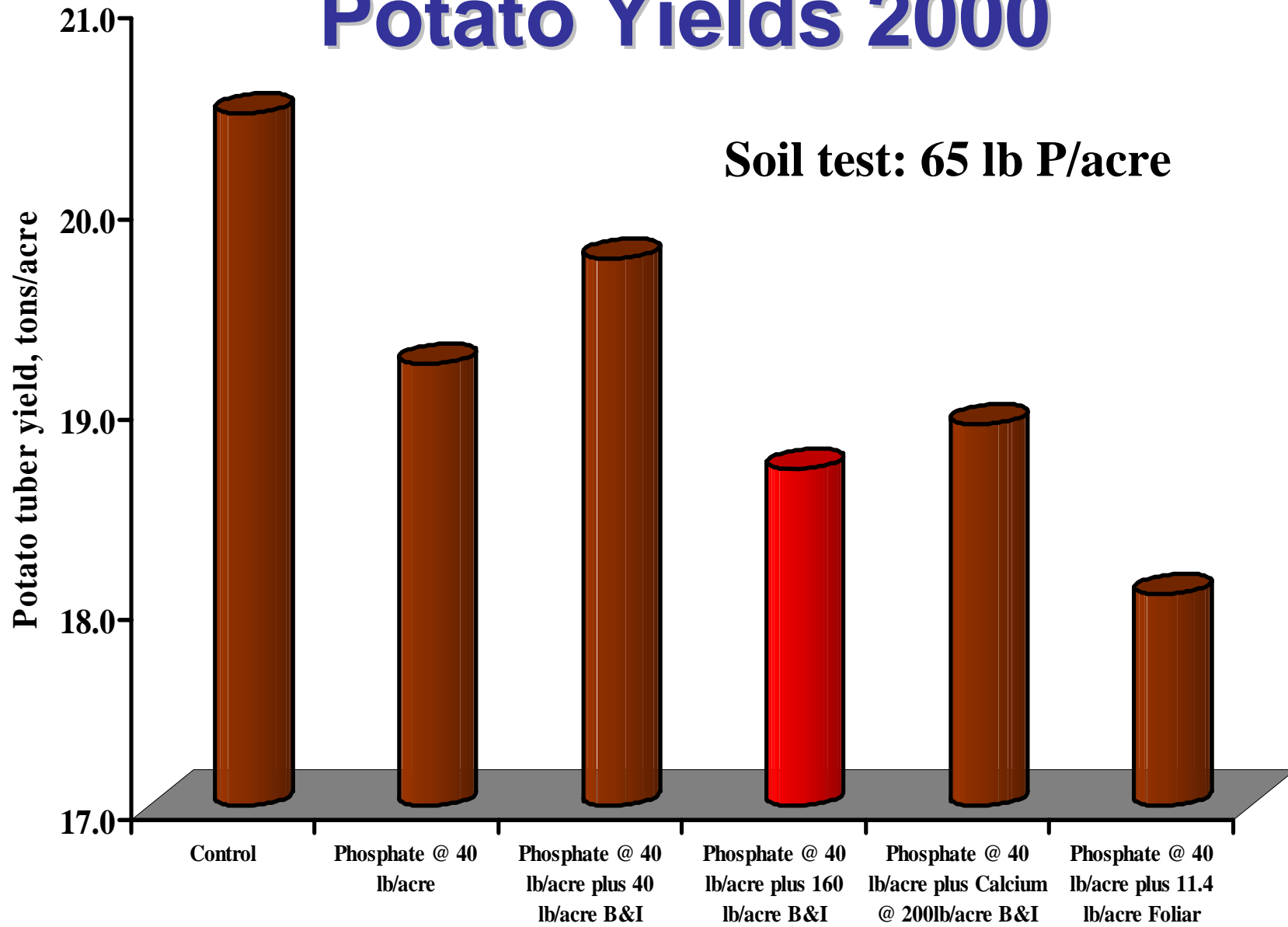


# Potato Yields 1999

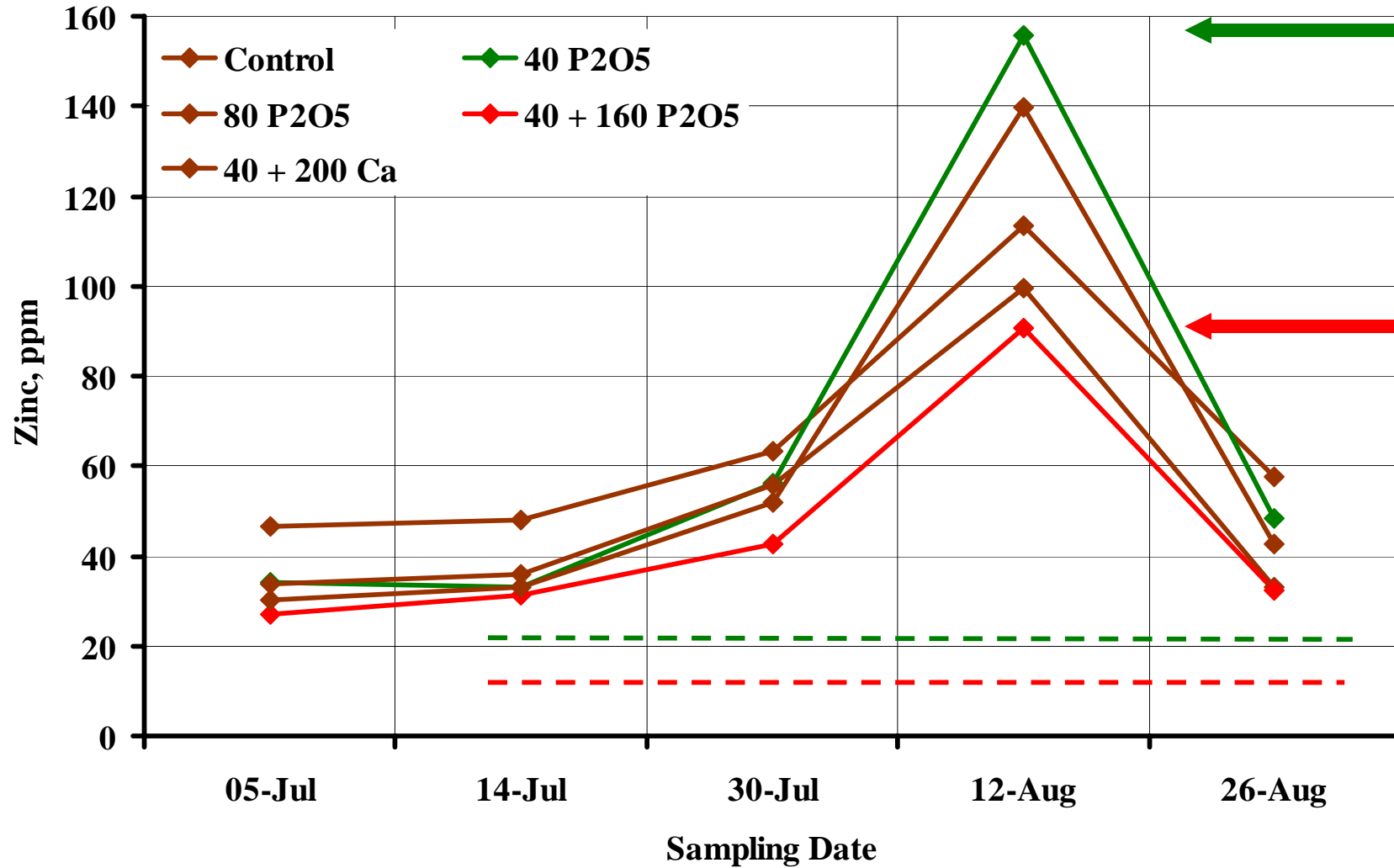


# Potato Yields 2000

Soil test: 65 lb P/acre



# Petiole Zinc Levels



# Types of Operating Costs

✱ **Essential: Seed.**

✱ **Enhancement: Fertilizer, Seed.**

✱ **Maintenance: Fertilizer, Herbicide.**

✱ **Protection: Herbicide, Insecticide, Fungicide.**

✱ **Insurance: Herbicide, Insecticide, Fungicide, Fertilizer.\***

# Define what “works” means to you?

**\*Enhancement: Fertilizer, Seed**  
**These two will pay the bills!**

- **Minimum \$2:\$1 return**
- **Spend your fertilizer \$\$ wisely**

