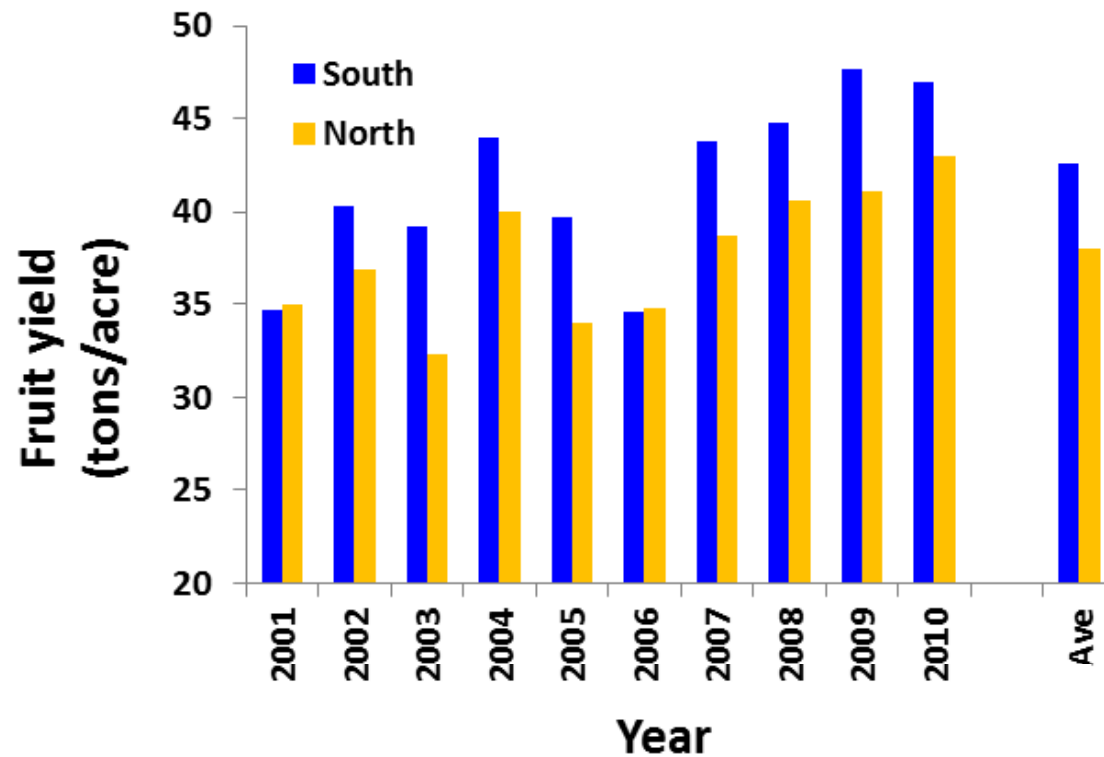


**North / South difference in tomato productivity :  
Why does it exist, and what can be done ?**

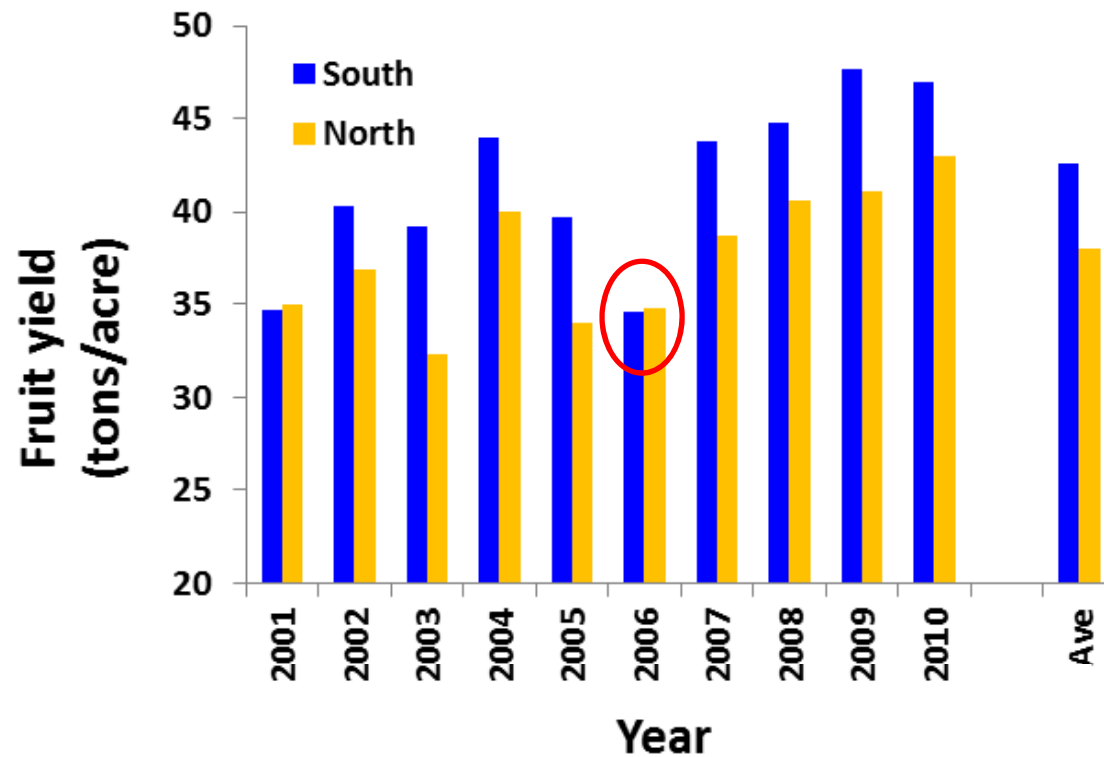




**Average yield difference = 4.5 tons/acre**

**South = Fresno, Merced and Kings Counties**

**North = Yolo, Colusa, Solano and Sutter Counties**

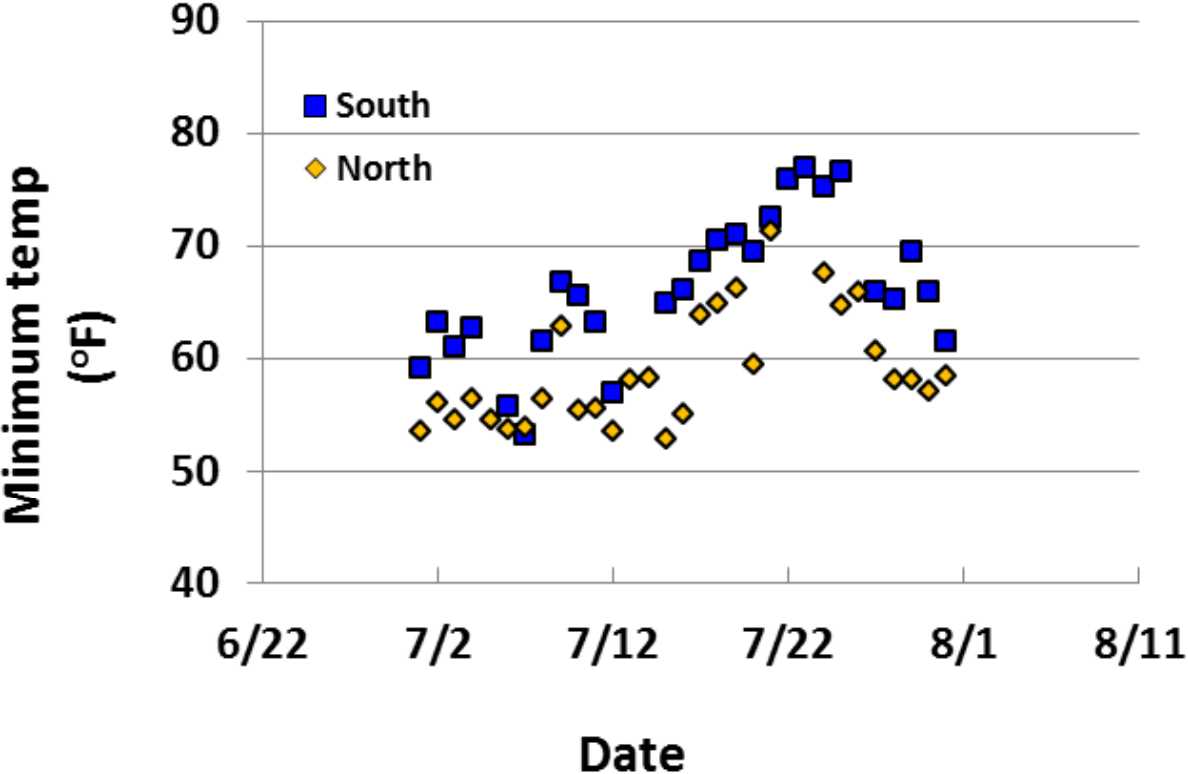


**Average yield difference = 4.5 tons/acre**

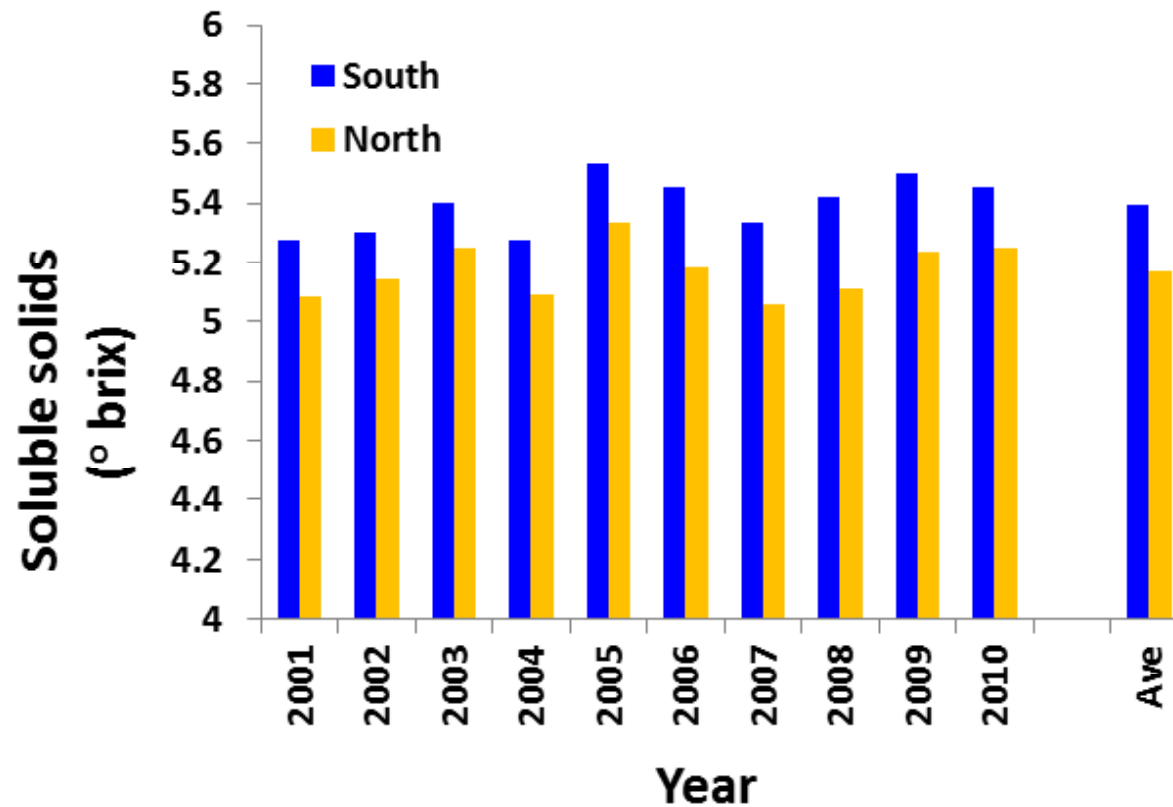
**South = Fresno, Merced and Kings Counties**

**North = Yolo, Colusa, Solano and Sutter Counties**

In 2006, July temperature affected fruit set :



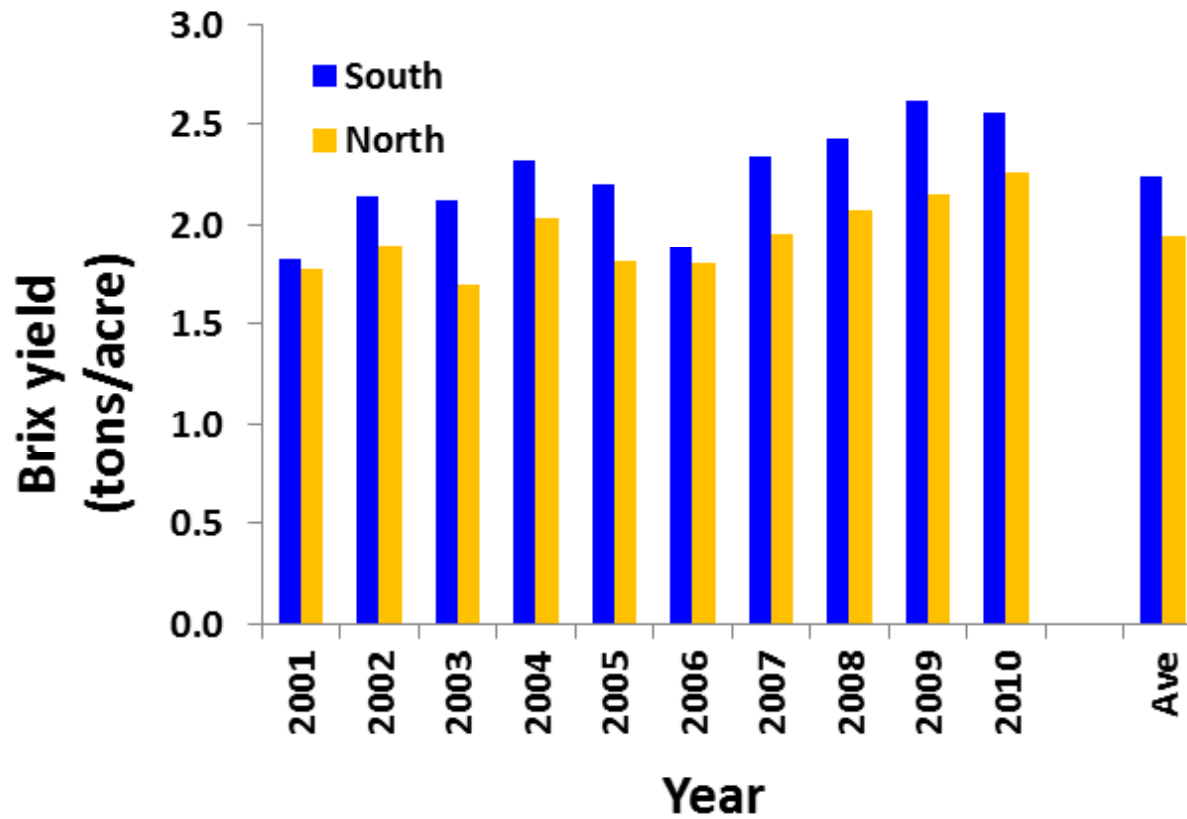
Data from Five Points and Davis



**Average soluble solids difference = 0.2 °brix**

**South = Fresno, Merced and Kings Counties**

**North = Yolo, Colusa, Solano and Sutter Counties**



**Average brix yield difference = 15%**

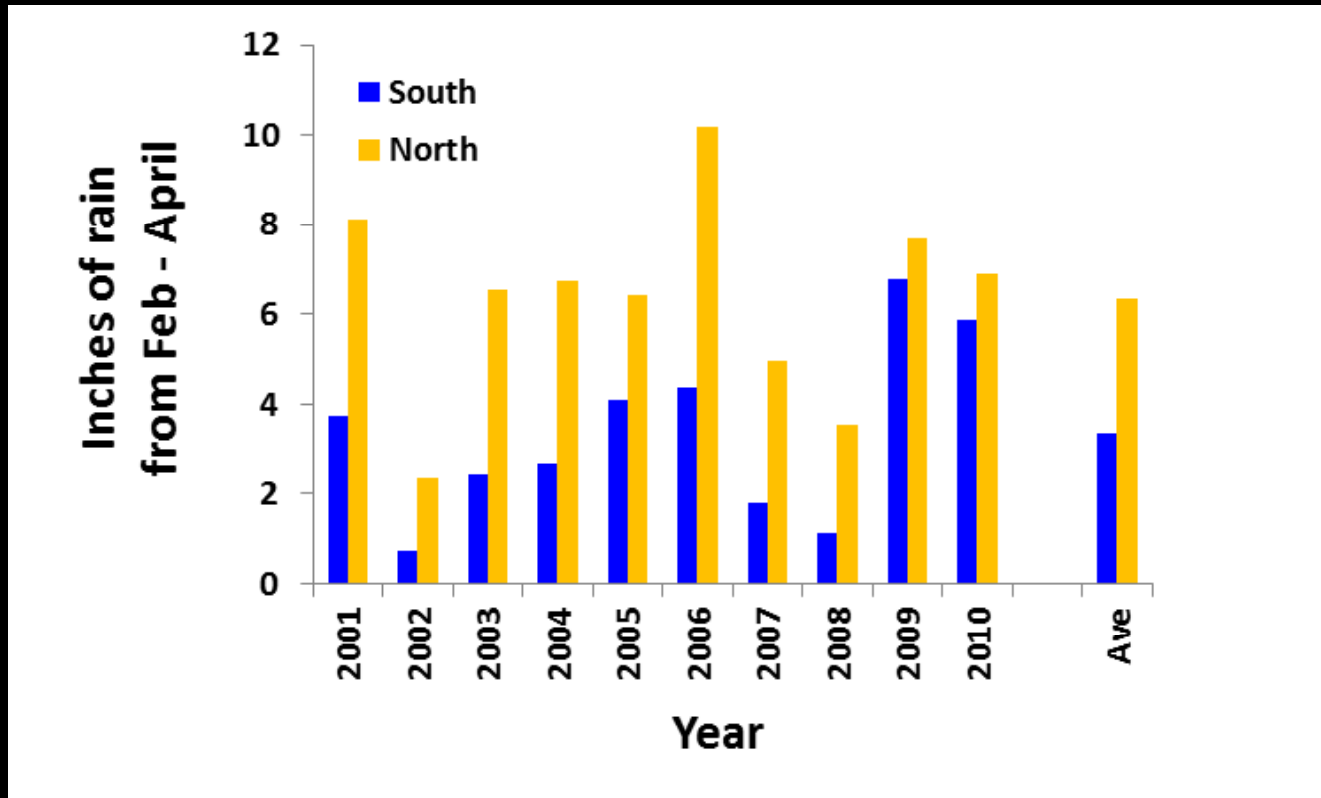
**South = Fresno, Merced and Kings Counties**

**North = Yolo, Colusa, Solano and Sutter Counties**

## Why the difference ?

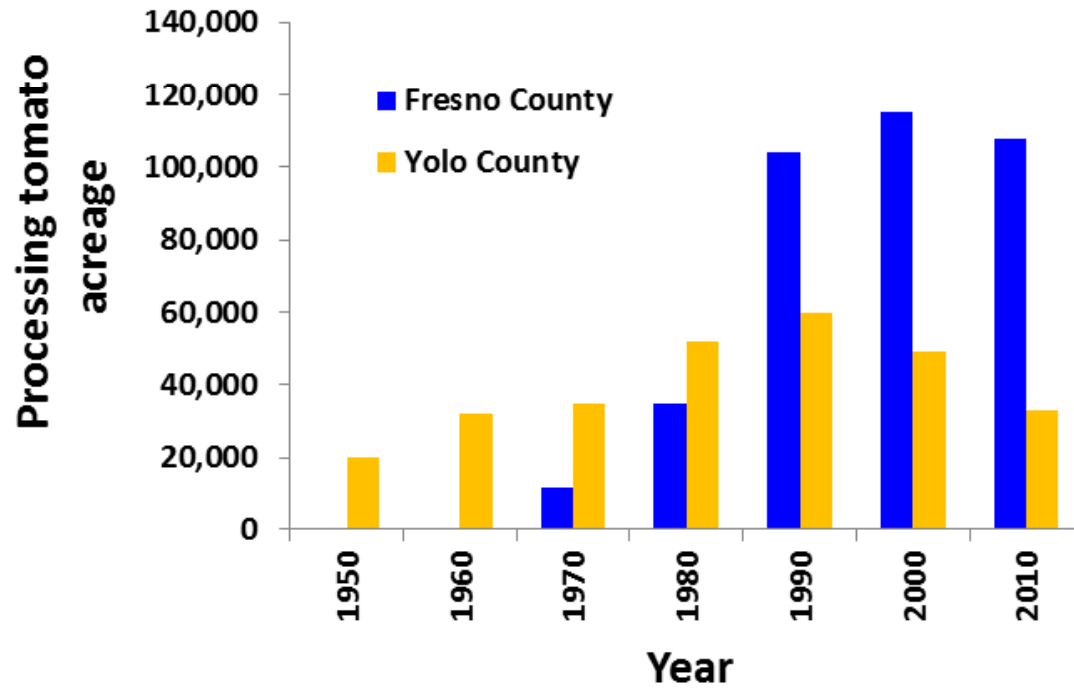


# Why the difference ?



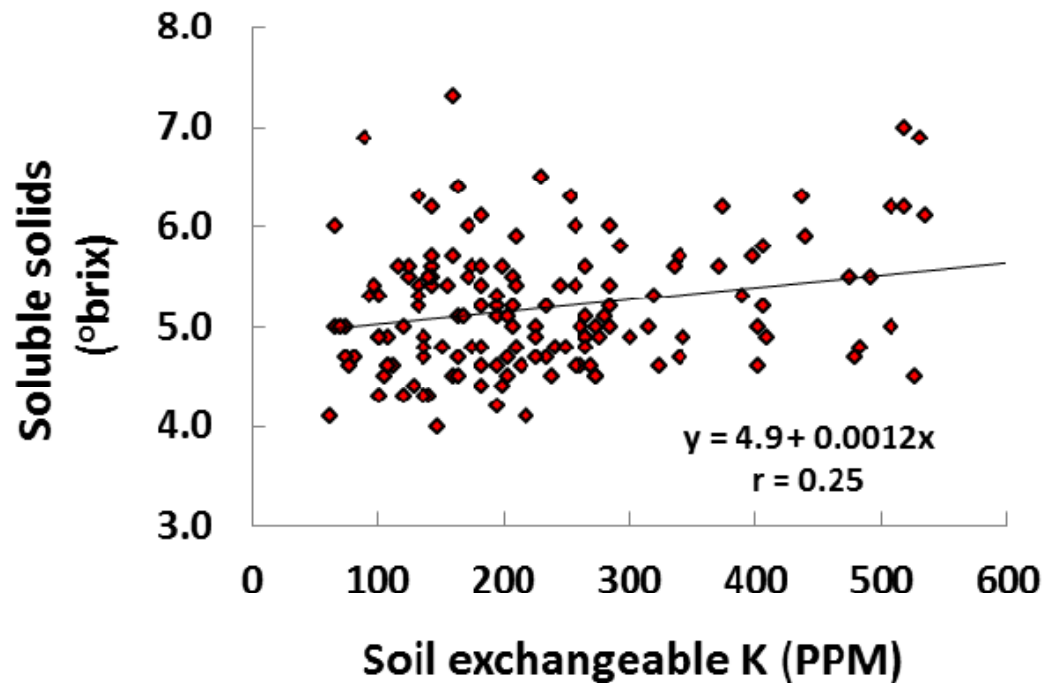


# Why the difference ?



North is disadvantaged by longer cropping history :

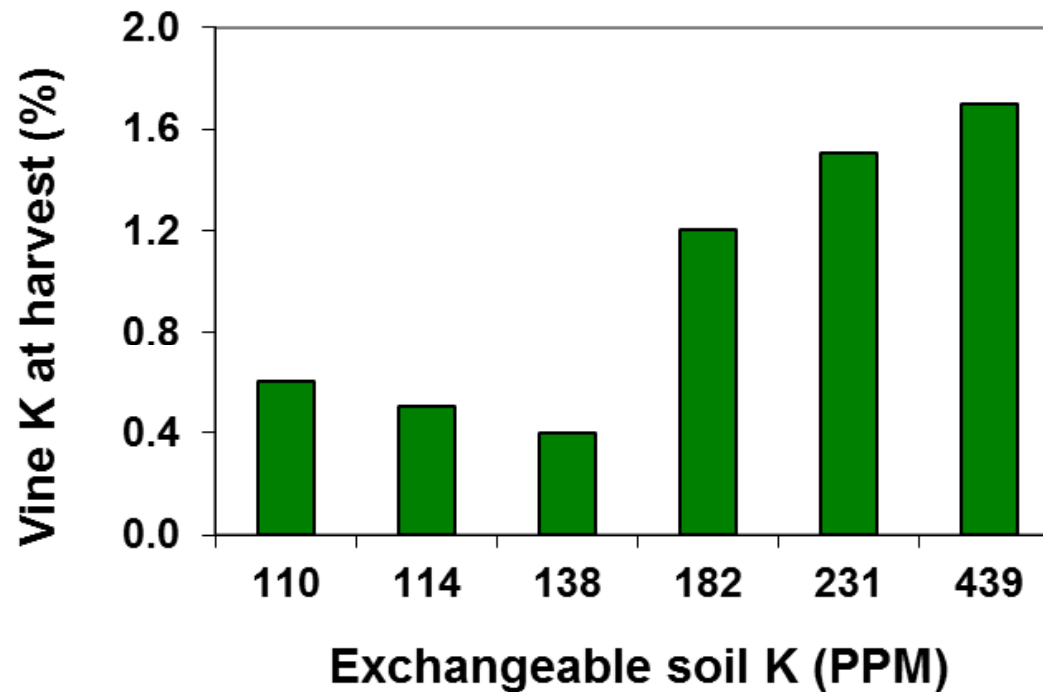
|                            | South | North |
|----------------------------|-------|-------|
| Exchangeable K (PPM)       | 285   | 176   |
| K as a % of cation charges | 3.0   | 1.7   |



Regional soil characteristics, from 1997-98 tomato quality survey

**North is disadvantaged by longer cropping history :**

|                                   | <b>South</b> | <b>North</b> |
|-----------------------------------|--------------|--------------|
| <b>Exchangeable K (PPM)</b>       | <b>285</b>   | <b>176</b>   |
| <b>K as a % of cation charges</b> | <b>3.0</b>   | <b>1.7</b>   |



**Regional soil characteristics, from 1997-98 tomato quality survey**

**Early vine decline may be K related :**



## North is disadvantaged by serpentine geology :

|                            | South | North |
|----------------------------|-------|-------|
| Exchangeable Ca (meq/100g) | 17.4  | 14.4  |
| Exchangeable Mg (meq/100g) | 6.1   | 11.1  |

High Magnesium relative to Calcium has deleterious effects :

- Promotes 'hardsetting'
- Reduces water infiltration rate

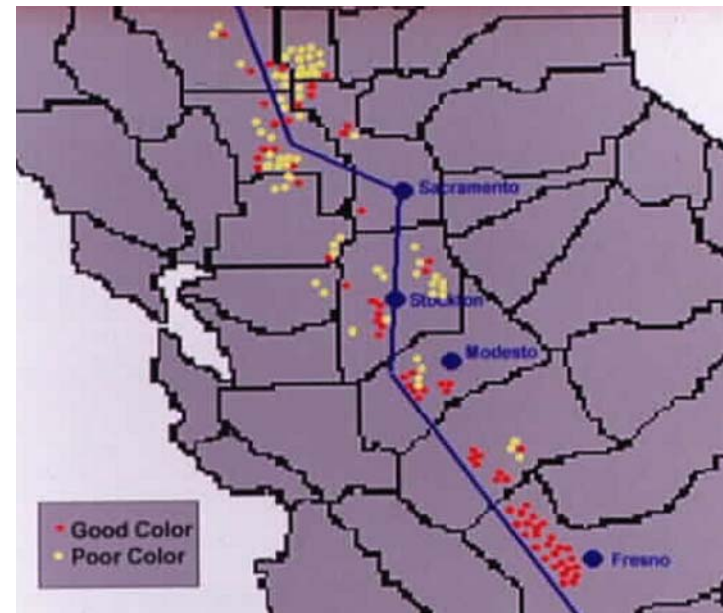


Regional soil characteristics, from 1997-98 tomato quality survey

**North is disadvantaged by serpentine geology :**

|                            | <b>South</b> | <b>North</b> |
|----------------------------|--------------|--------------|
| Exchangeable Mg (meq/100g) | 6.1          | 11.1         |
| Exchangeable K (meq/100g)  | 0.73         | 0.45         |
| Mg / K ratio               | 8.4          | 24.6         |

**High Magnesium relative to Potassium suppresses K uptake**



**Regional soil characteristics, from 1997-98 tomato quality survey**

**So, what can be done ?**



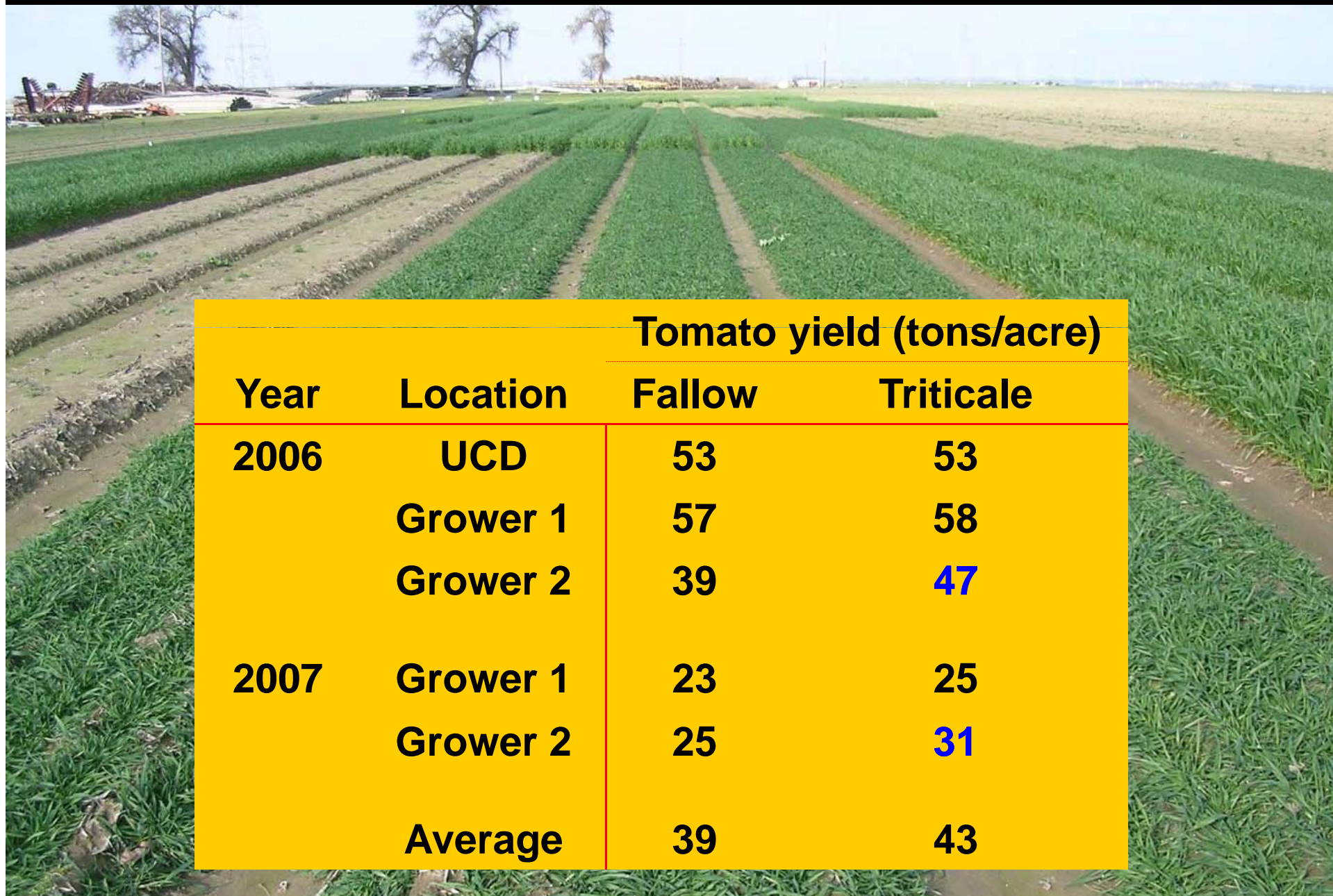
**1 ton gypsum / acre will provide approximately 1 meq/100g exchangeable Ca  
in the top 6 inches of soil**

**So, what can be done ?**





## So, what can be done ?



| Year | Location | Tomato yield (tons/acre) |           |
|------|----------|--------------------------|-----------|
|      |          | Fallow                   | Triticale |
| 2006 | UCD      | 53                       | 53        |
|      | Grower 1 | 57                       | 58        |
|      | Grower 2 | 39                       | 47        |
| 2007 | Grower 1 | 23                       | 25        |
|      | Grower 2 | 25                       | 31        |
|      | Average  | 39                       | 43        |

**So, what can be done ?**

**Strategically increase K fertilization, based on :**

- **Soil test characteristics**
- **Early fruit set leaf K**
- **End-of-season vine K ??**



# For more soil fertility information ...



*Vegetable Research & Information Center*  
University of California Cooperative Extension

## UC Soil Fertility Short Course

**February 22, 2012**  
**Buehler Alumni & Visitors Center, UC Davis**

This short course will focus on the practical aspects of soil fertility management in an era of escalating fertilizer costs and increasing government regulation of nutrient inputs for environmental water quality protection. The topics covered will include:

- getting the maximum value from soil testing
- interpretation of laboratory soil test results
- comparing fertilizer sources
- developing crop nutrient management plans
- fertilizer management and environmental protection

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- 🔗 Virtual tour

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