Impact of potassium fertility on postharvest fruit quality: Melon (*Cucumis melo* L) case study.

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This presentation was made at the IPI-OUAT-IPNI International Symposium, 5-7 November 2009, OUAT, Bhubaneswar, Orissa, India. The Role and Benefits of Potassium in Improving Nutrient Management for Food Production, Quality and Reduced Environmental Damage.

Review of published abstracts on the influence of potassium (K): by

1. crop,
2. K application,
3. K form
4. on fruit attributes

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Review of published abstracts

Crop	K application	K form	Attribute improved	Reference
Mango	Soil	KNO_3	none	Simones (2001)
Pear	Soil	KNO_3	none	Johnson (1998)
Pepper	Soil	KCl	little	Hochmuth (1994)
Strawberry	Soil	KCl	none	Albregts (1996)
Watermelon	Soil	KCl	little	Lacasico (2002)

Review of published abstracts

Crop	K application	K form	Attribute improved	Reference
Apple	Soil	K_2SO_4	Color, firm., sugars, yield	El-Gazzar (2000)
Cucumber	Soil	K_2SO_4> KCl	Amino acids & general quality	Guo (2004)
Kiwifruit	Soil	K_2SO_4>KCl	Firm. Acid & grade	Dutta (2004)
Pepper	Soil	K_2SO_4>KNO_3	pungency	Ananthi (2004)
Tomato	Soil	KCl>KNO_3	Appearance & quality	Hewedy (2000)

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Review of published abstracts

Crop	K application	K form	Attribute improved	Reference
Apple	Foliar	KCl	Size, color, quality	Wojcik (2005)
Citrus	Foliar	K_2SO_4	general quality	Shawky (2000)
Cucumber	Foliar	KCl>KNO_3	General quality & disease	Magen (2003)
Guava	Foliar	K_2SO_4>KCl	Acidity, quality	Dutta (2004)
Pomegranate	Foliar	K_2SO_4>KCl	Size, yield & quality	Herath (2000)

Influence of potassium (K): K application & form on fruit attributes

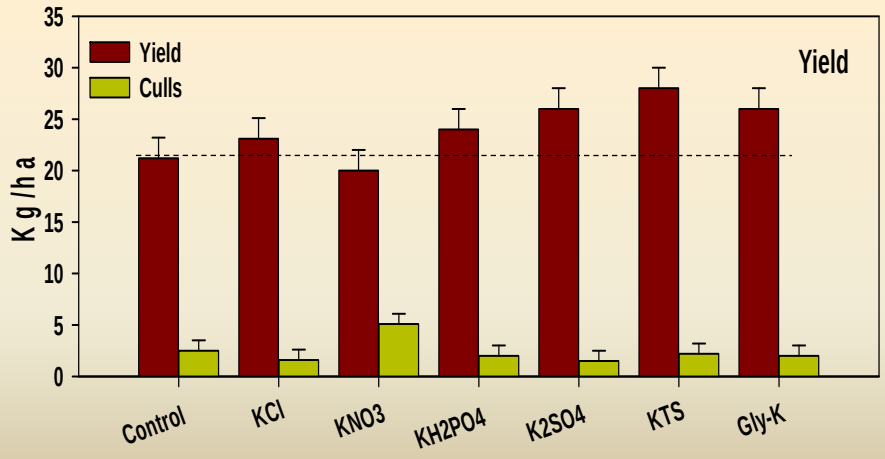
Findings suggest

- 1. Foliar > soil applied K
- 2. K_2SO_4 > KCl > KNO_3

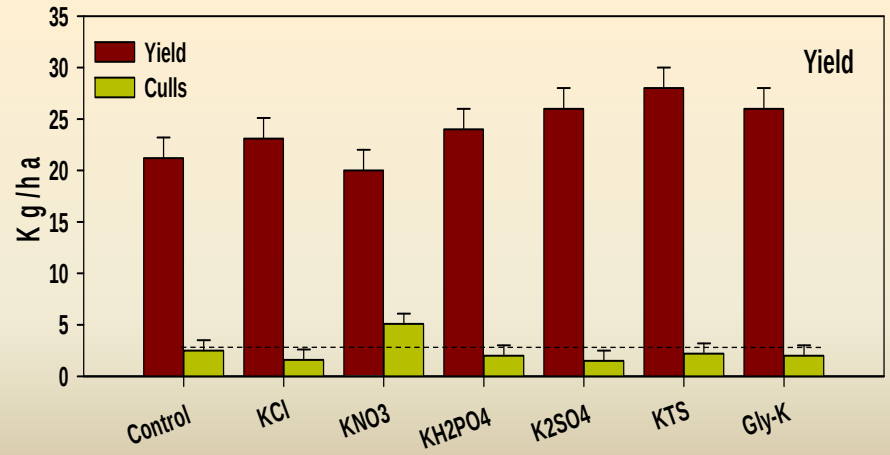
Case study with Melon: effects on Quality

- Case study with Melon: effects on Quality
- A. K forms
- B. Seasonal affects
- C. No. of applications

Foliar K form comparisons



Foliar K form comparisons



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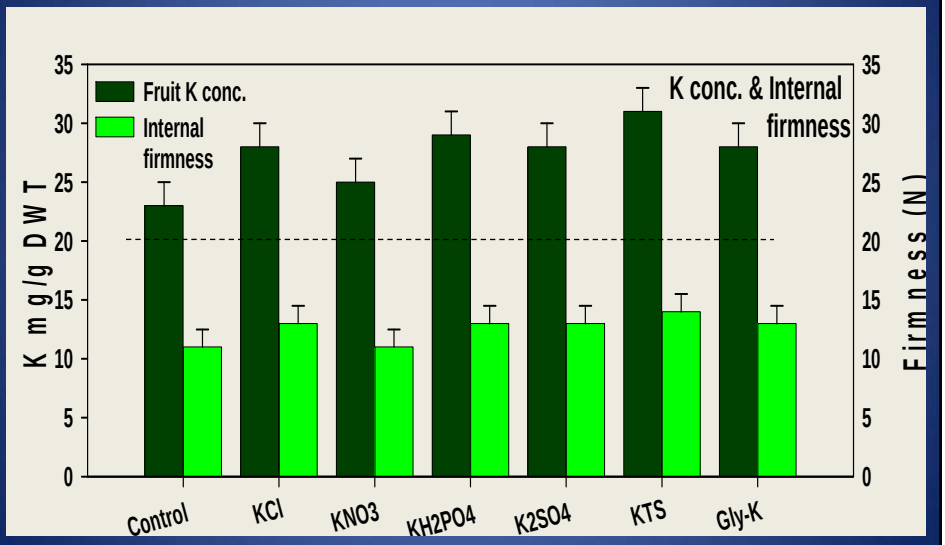

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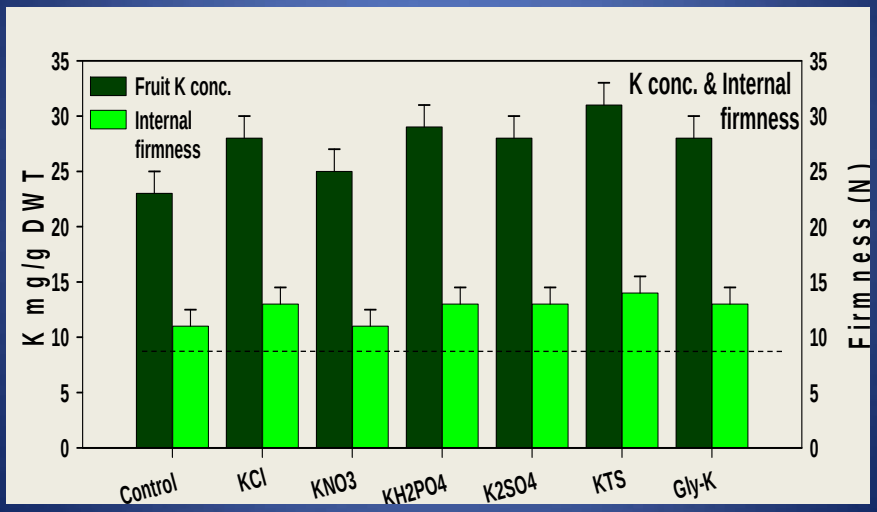

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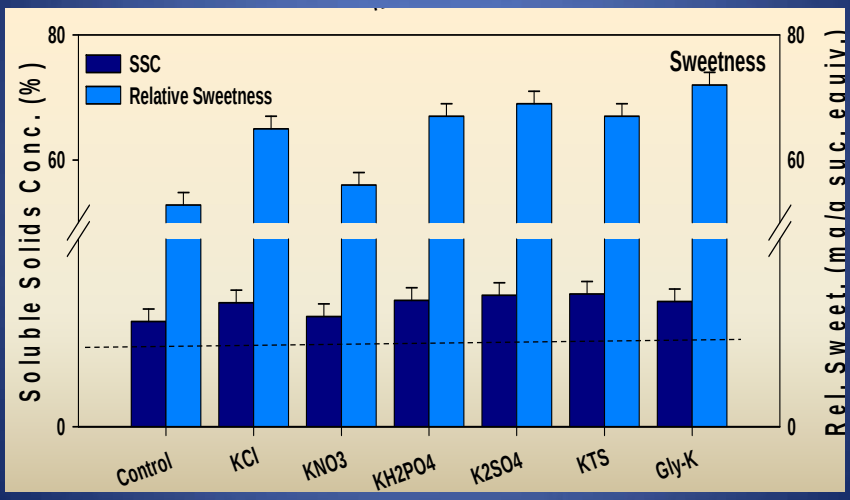

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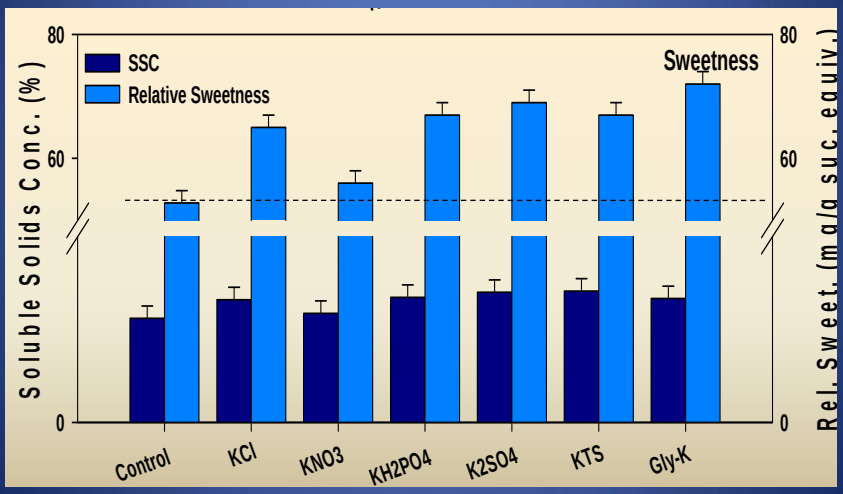

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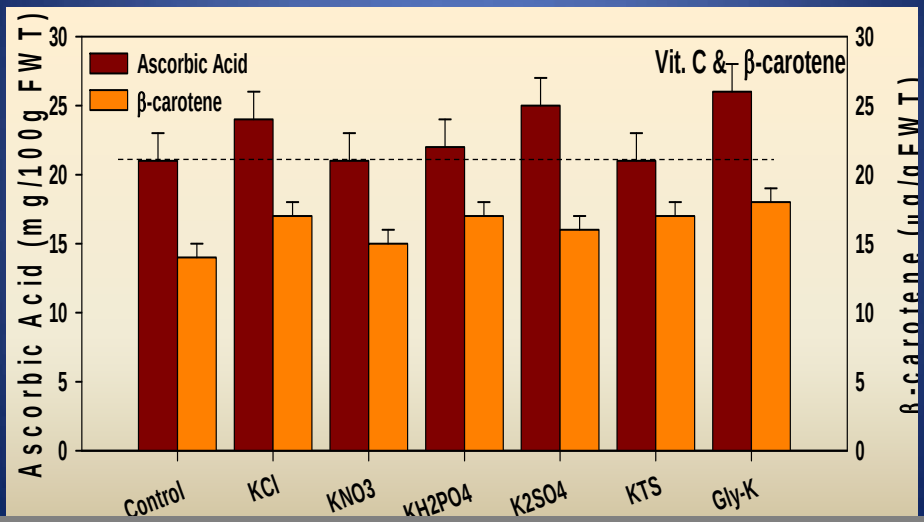

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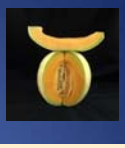

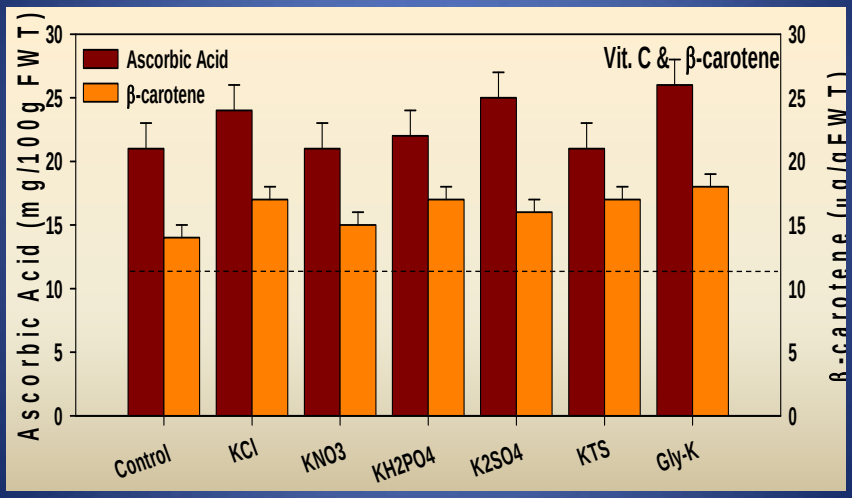

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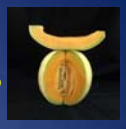
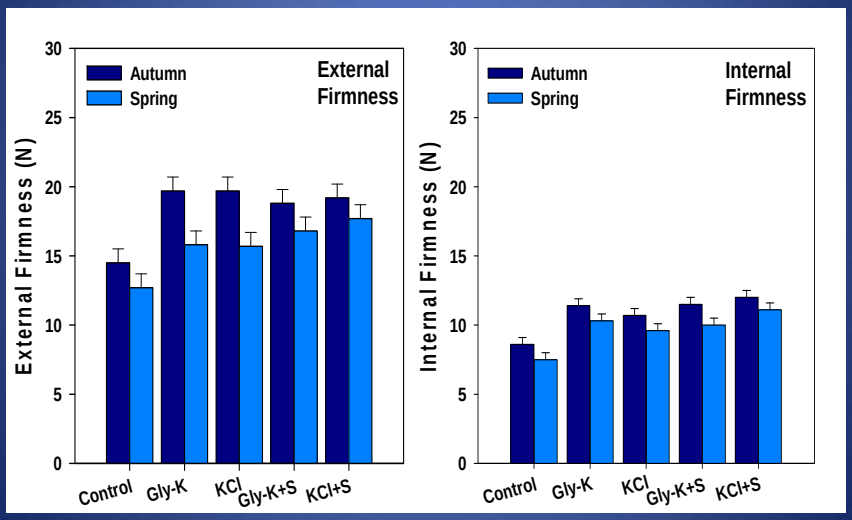
Foliar K form & season comparisons





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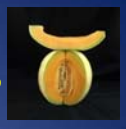
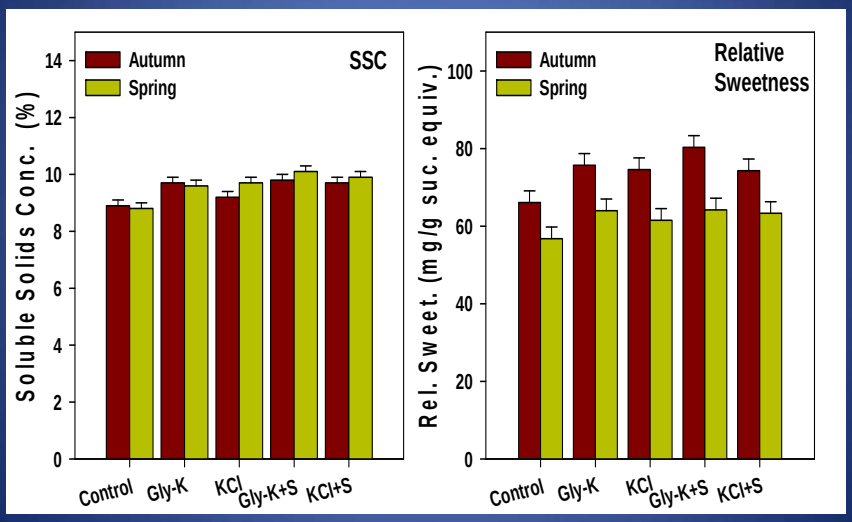
Treatment: K form +/- surfactant	Fruit Pressure ψ_p (MPa)
Gly-K	0.046 b
KCl	0.030 c
Gly-K +S	0.067 a
KCl + S	0.075 a
Control	0.000 d
P≤ 0.05	

Foliar K form & season comparisons





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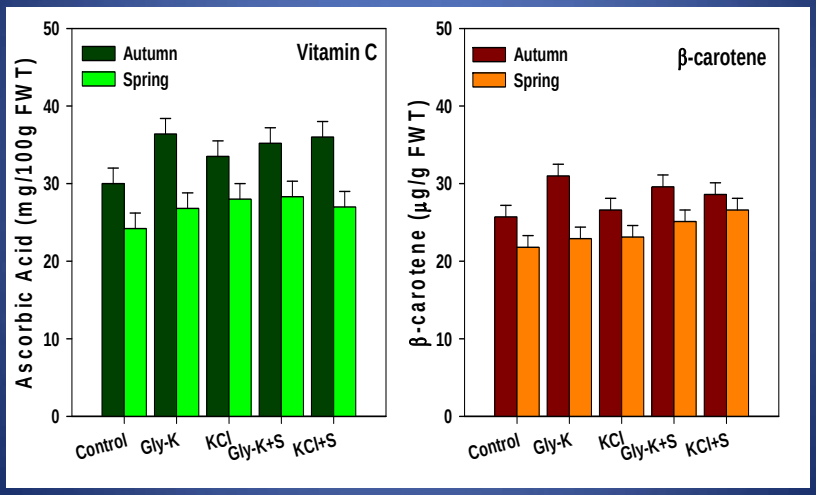
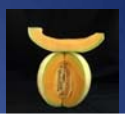
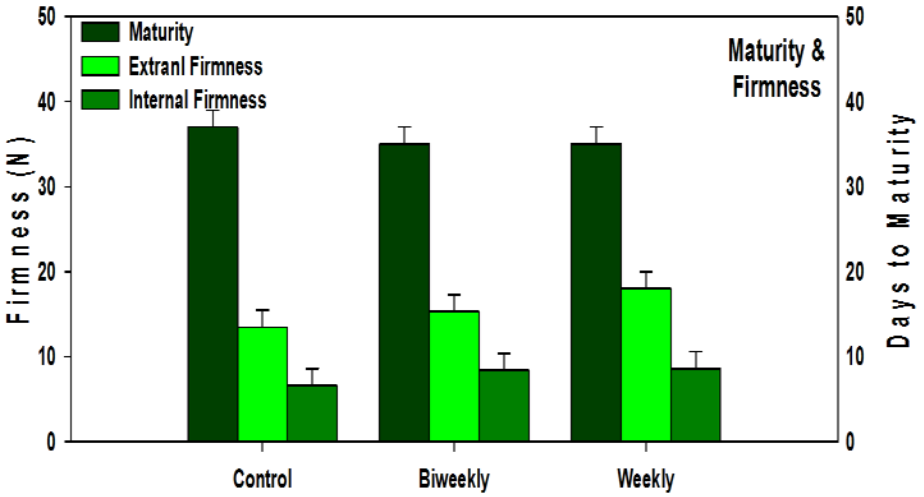
Foliar K form & season comparisons



No. of foliar K applications





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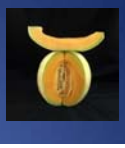

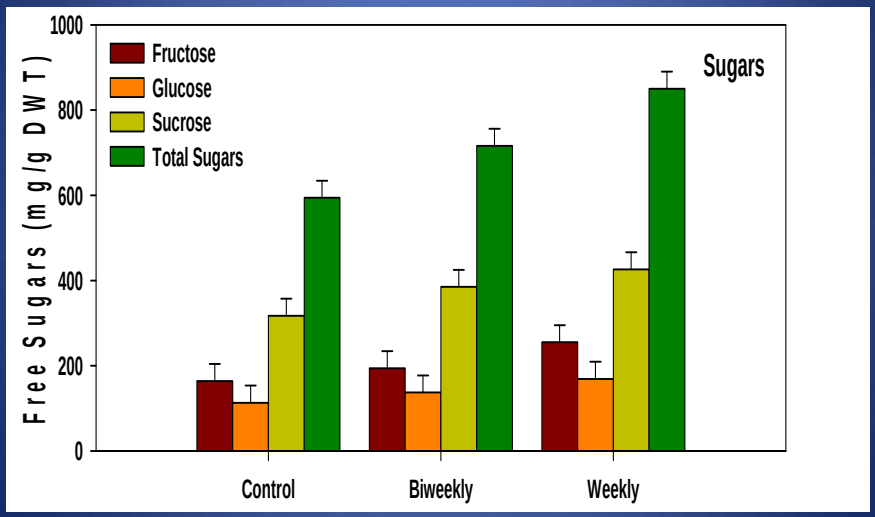

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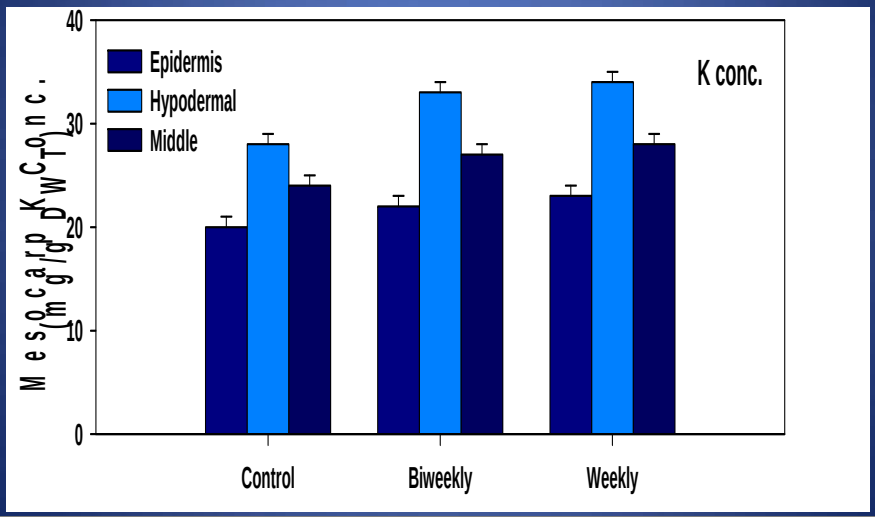

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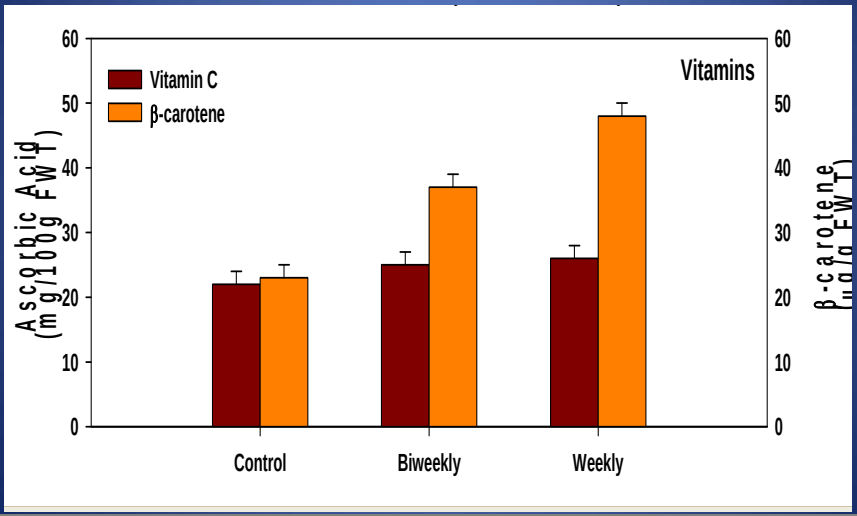

Conclusions

- 1. **Supplementing soil K supply with foliar K applications during fruit development improves fruit quality, increases firmness, sugar content, ascorbic acid, and beta-carotene levels.**

Conclusions

- 2. Among the K salts, KNO_3 has little or no beneficial effects on fruit quality when applied during fruit development.
- **Foliar fertilization with KNO_3 would likely be beneficial during vegetative growth when N is needed for development of leaves, enhancing *photosynthetic* capacity.**

Conclusions

- 3. **Fruit quality improvements were obtained using a simple management tool that growers, the world over, can easily utilize.**

Conclusions

- 4. Future research: Validate using
- A. commercial fields (differing in K conc.),
- B. different environments (temperate vs. tropical),
- C. productions systems (conventional vs. organic),
- D. evaluate K forms on marketable quality and health-bioactive attributes of other fruits.

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