

Crop coefficients of major irrigated crops in Ceará

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Major irrigated crops - Ceará

Crop	Irrigated area (ha)
Coconut	12400
Banana	10900
Passion fruit	10400
Melon	7300
Sugarcane	6900
Beans	2700
Corn	2194
Watermelon	2030
Acerola	2450
Papaya	1300
Mango	1160
Guava	1260

Source: IBGE / ADECE (2014)

Crop coefficient studies for major irrigated crops in Ceará

Crop	ETc estimation / measurement method	Reference
Coconut (<i>Cocos nucifera</i> L.)	Soil water balance	Miranda et al. (2007)
Banana (<i>Musa spp.</i>)	Drainage lysimeter	Costa (2009)
Banana (<i>Musa spp.</i>)	Drainage lysimeter	Barroso et al. (2010)
Banana (<i>Musa spp.</i>)	Soil water balance	Silva; Bezerra (2009)
Passion fruit (<i>Passiflora sp.</i>)	Soil water balance	Souza et al. (2009)
Melon (<i>Cucumis melo</i>)	Weighing lysimeter	Miranda et al. (1999)
Sugarcane (<i>Saccharum officinarum</i>)	Weighing lysimeter	Gonçalves; Miranda (2014)
Cowpea bean (<i>Vigna unguiculata</i>)	Soil water balance	Santos (1998)
Watermelon (<i>Citrulus lanatus</i>)	Soil water balance	Bezerra; Oliveira (1999)
Watermelon (<i>Citrulus lanatus</i>)	Weighing lysimeter	Miranda et al. (2004)
Watermelon (<i>Citrulus lanatus</i>)	Soil water balance	Carvalho et al. (2007)
Papaya (<i>Carica papaya</i>)	Soil water balance	Montenegro (2002)
Chili Pepper (<i>Capsicum frutescens</i>)	Drainage lysimeter	Chaves et al. (2004)
Chili Pepper (<i>Capsicum frutescens</i>)	Weighing lysimeter	Miranda et al. (2006)
Pineapple (<i>Ananas comosus</i>)	Weighing lysimeter	Pontes (2002)

Factors affecting the results of crop coefficient studies in Ceará

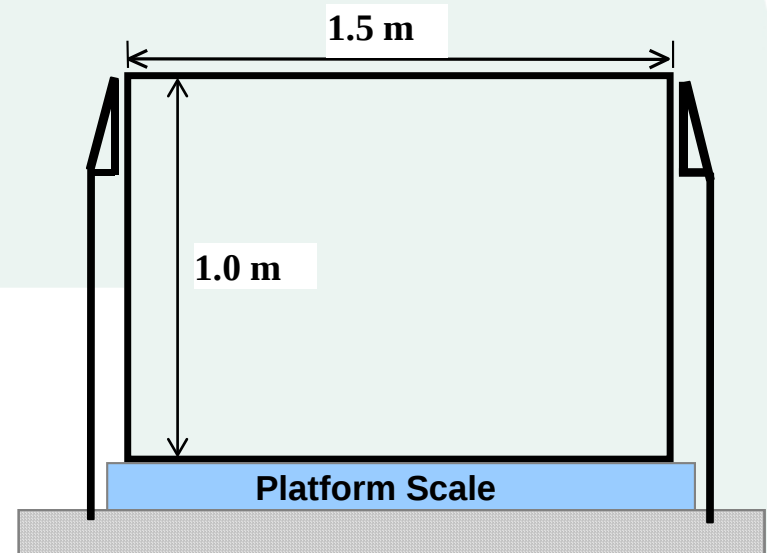
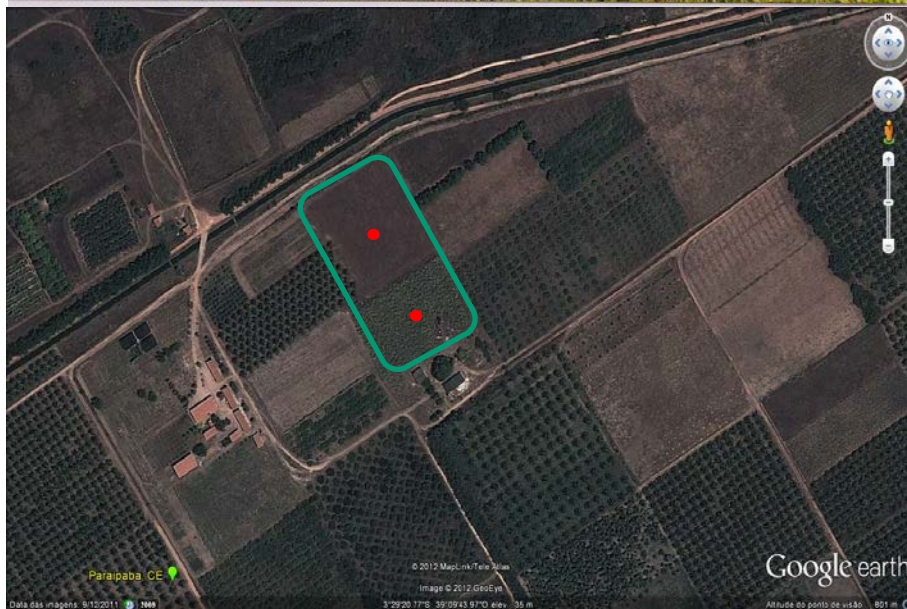
- ET_c estimation/measurement method
- ET_o estimation: Penman-Monteith, Class A pan, Hargreaves, ...
- Irrigation method: sprinkler, drip, subsurface drip
- Soil characteristics / irrigation frequency
- Agronomic practices



Public irrigation projects and location of weighing lysimeters in Ceará



Weighing lysimeters – Paraipaba, CE



Crop evapotranspiration studies

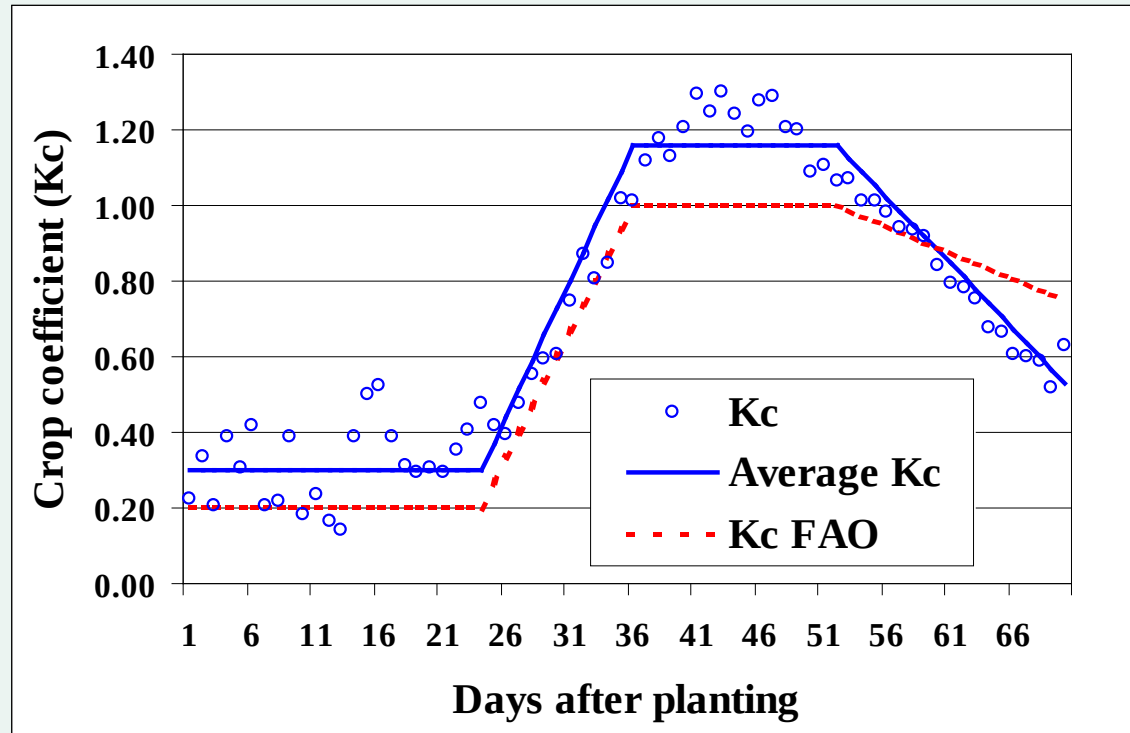
Paraipaba weighing lysimeter



Watermelon (*Citrulus lanatus*)



Watermelon crop coefficient

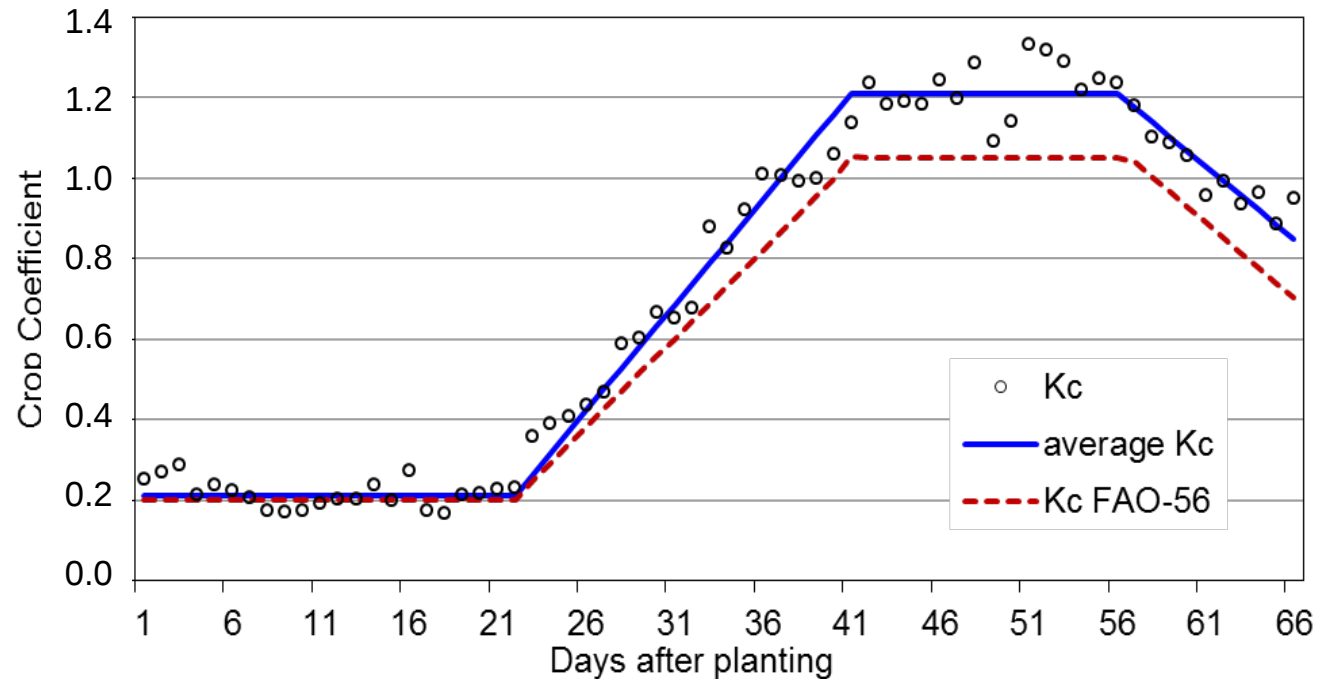


Growth stage	Kc	Kc FAO 56
Initial	0.30	0.20
Mid season	1.15	1.00
Late season	0.58	0.75

Melon (*Cucumis melo*)



Melon crop coefficient

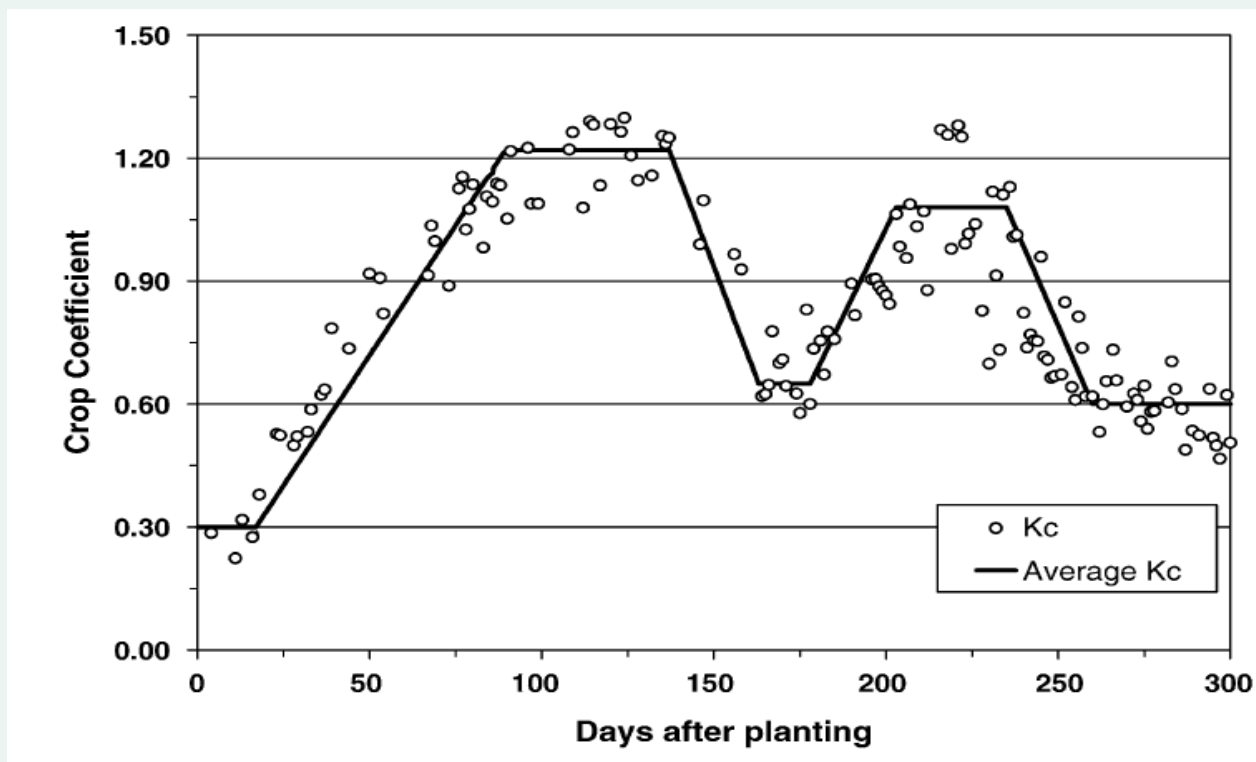


Growth stage	Kc	Kc FAO 56
Initial	0.21	0.20
Mid season	1.20	1.05
Late season	0.97	0.75

Chili Pepper (*Capsicum frutescens* L.)



Chili pepper crop coefficient

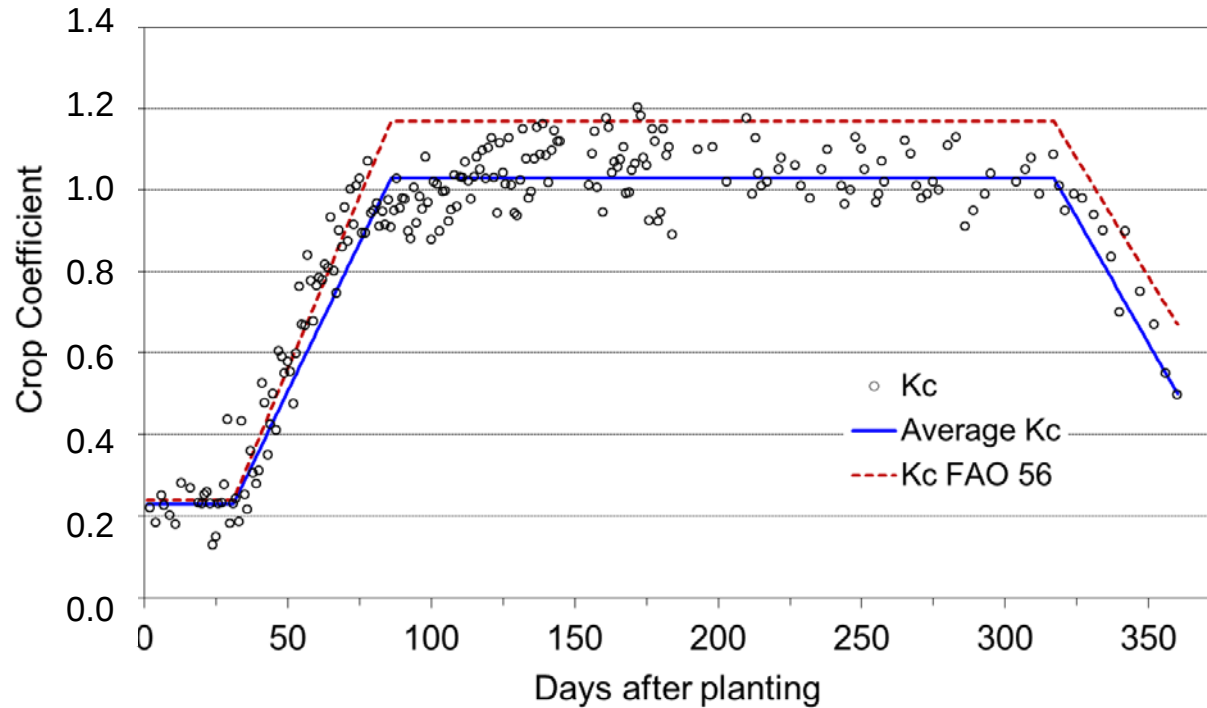


Growth stage	Kc	Kc FAO 56
Initial	0.30	0.30
Mid season	1.22 - 1.08	1.05
Late season	0.65 – 0.60	0.90

Sugarcane (subsurface drip irrigated)



Sugarcane Kc (subsurface drip)



Growth stage	Kc	Kc FAO 56
Initial	0.23	0.24
Mid season	1.06	1.17
Late season	0.50	0.67

Conclusions

- ✓ The crop coefficients of most major irrigated crops of Ceará have been determined locally
- ✓ For annual crops, FAO-56 crop coefficients tend to underestimate ETc in Ceará conditions
- ✓ New Kc studies are needed to keep up with changes in crop production systems (new varieties, drip irrigation, use of plastic mulch, etc.)



Thank You!

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