

Nutrient and irrigation requirements for poplar pole production

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Key Objectives:

- To determine the optimal concentrations of foliar and soil nutrients to maximise production efficiency in poplar and willow production nurseries, and the level of fertilisation required to achieve this.
- To determine the role that irrigation plays in conjunction with fertilisation in pole production.

Experiment Design:

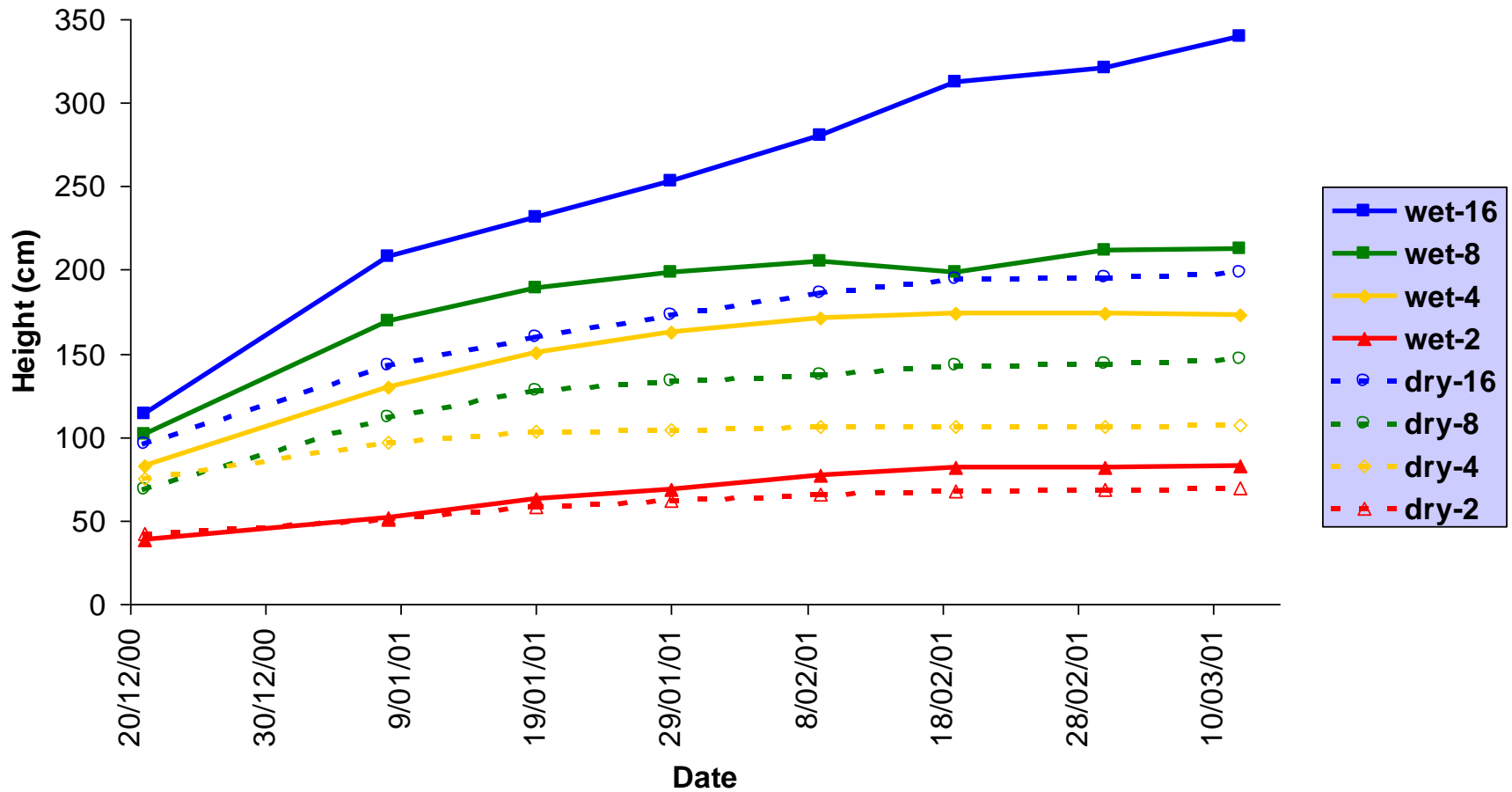
- Three poplar clones: **Kawa, Veronese, Shinsei**. Four replicates per clone.
- Four fertiliser levels: 20, 40, 80, 160 g of Nitrophoska Blue TE per cutting (one application at time of planting).
- Two levels of irrigation:
 - “Wet” = 0.5 - 2 min/day.
 - “Dry” = 0.5 - 2 min/3 days.

Experiment Design:

- Clones planted as 25 cm cuttings on 26 October 2000. Cutting numbers: $3 \times 4 \times 2 \times 4 = 96$.
- Early December 2000: Plants pruned back to two leaders.
- Expt finished on 12/3/01.
- Measurements:
 - Height and diameter (8 times throughout the season).
 - Leaf Area, Biomass (leaf, stem, root)

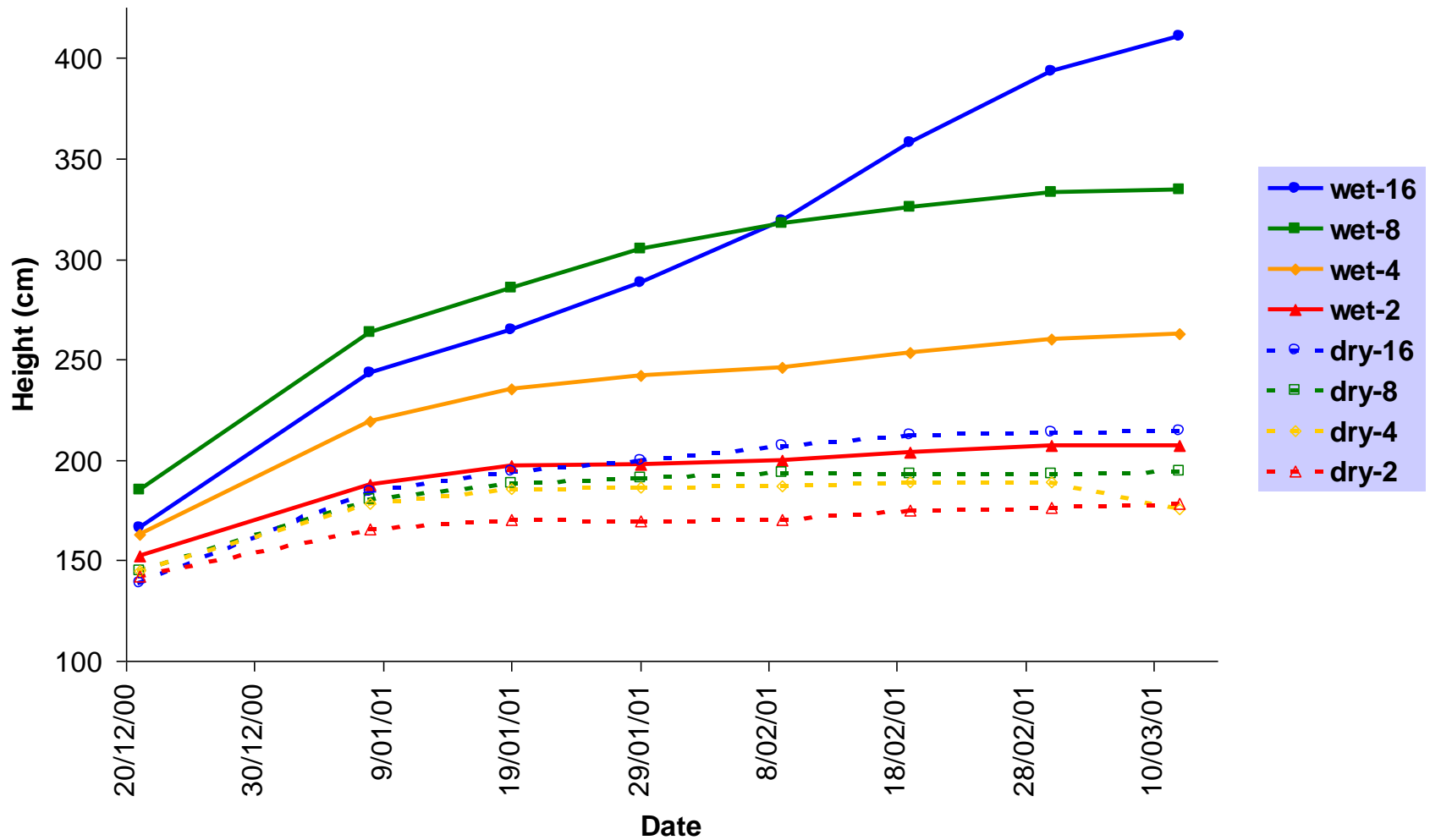
Results - Height

Veronese



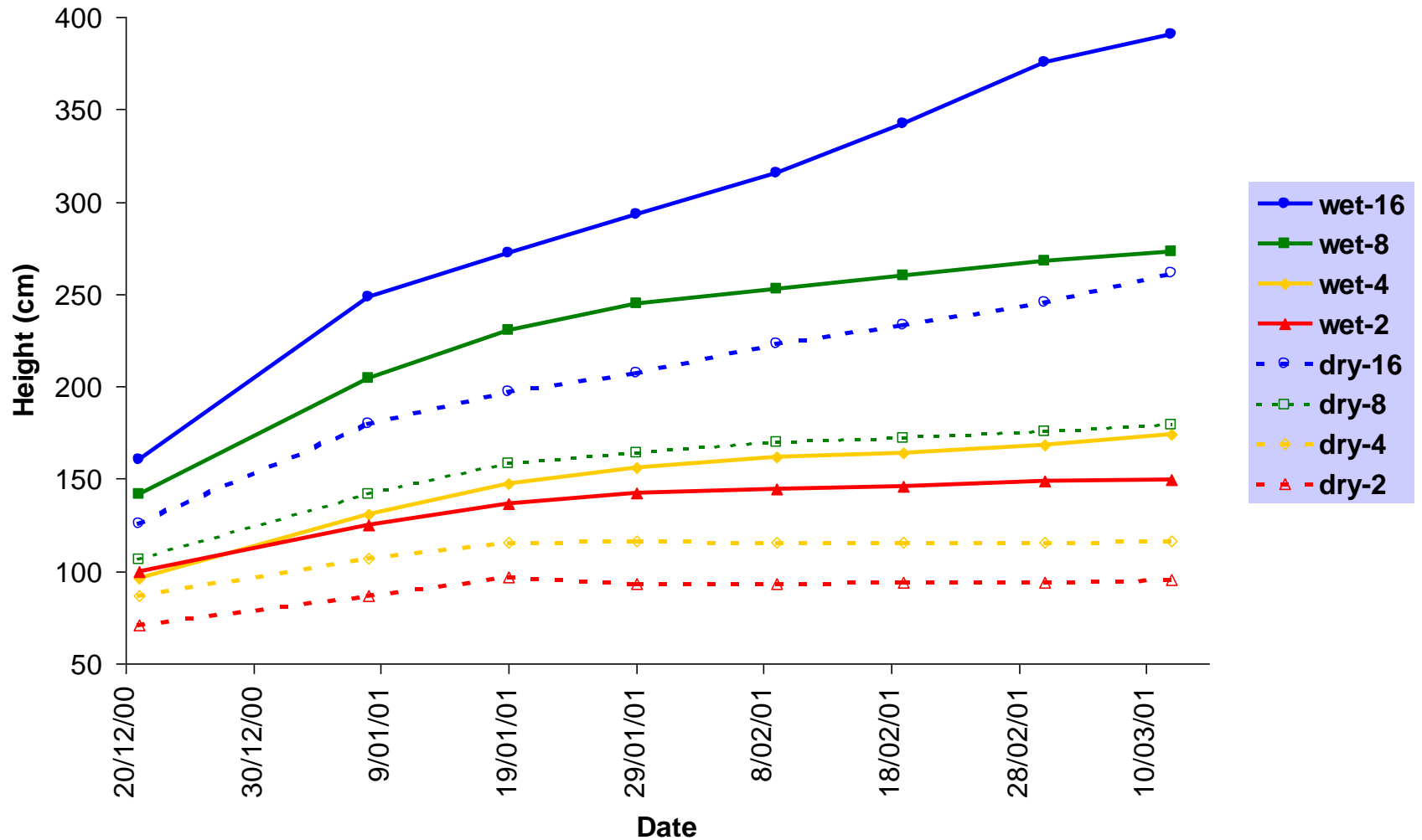
Results - Height

Shinsei



Results - Height

Kawa



Results - Final Height

Source	df	F Value	Pr > F
Clone (CL)	2	19.49	0.0001
Irrigation (IR)	1	89.09	0.0001
Fertiliser (FE)	3	69.97	0.0001
CL * IR	2	0.92	0.4036
CL * FE	6	1.87	0.0977
IR * FE	3	7.27	0.0003
CL * IR * FE	6	0.41	0.8695

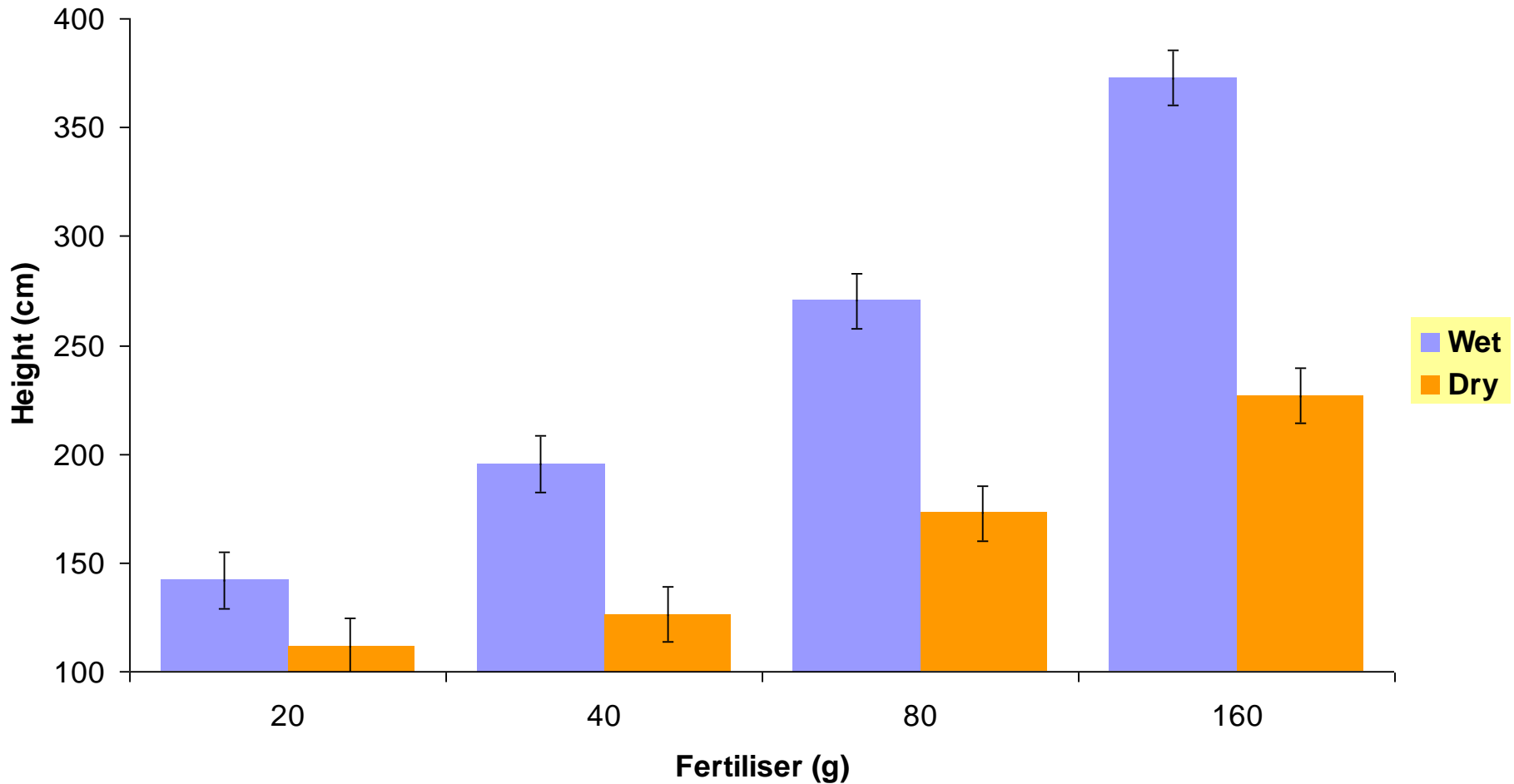
Clone	Height (cm)
Shinsei	235 ^a
Kawa	205 ^b
Veronese	166 ^c

Irrigation	Height (cm)
Wet	245 ^a
Dry	159 ^b

Fertiliser	Height (cm)
2	300 ^a
4	221 ^b
8	161 ^c
16	127 ^d

Results - Height

Final Heights (cm) by Irrigation and Fertiliser Level



Results - Other

- **Diameter:** Similar trends seen as for height, but more variability in measurements due to human error. Significant clone x fertiliser interaction.
- **Leaf Area** (final harvest): Similar trends (no sig dif between Shinsei and Kawa). Significant clone x fertiliser and irrigation x fertiliser interactions.
- Good correlation between Leaf Area and Height and Diameter:

$$LA = 21.82(Ht) + 109.65(D) - 2500.28$$

$$\text{Adjusted } r^2 = 0.92$$