

Maximising Soil Grown Greenhouse Crop Yields and Quality from Irrigation and Fertigation Scheduling

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Trial Details

- Trial located at Virginia, South Australia
- Trial run over 8 separate soil grown poly greenhouses – 1.6ha in total
- Andrew & Zurriyet Braham have been growing Capsicums for over 14 years
- AGAS Rural is a supplier of prescriptive soil fumigation gases
- HortEx is a grower organisation that specialises in grower trials

Preparation Steps

- **Soil Preparation is key**
 - Deep Ripping
 - Application of compost
 - Deep rotary hoeing of soil
 - DNA nematode soil testing
 - Fumigation of soil with Telone C35 at 55g/m²
- **Pressurised dripper tubes used for irrigation / fertigation**
 - Pressurised tubes decrease water application times
- **Planting seedlings 3 weeks after fumigation**
 - Plant density of 2.2 plants / m²

Soil Preparation & Fumigation Equipment



Pressurised Drippers & Evenly Spaced Plants



Irrigation & Fertigation Scheduling

- Water pH adjusted using nitric acid
- Liquid fertiliser injected via computer controlled venturi system
- Fertiliser applied whenever water is applied to plants
- Plants irrigated in 30 minute bursts, morning, noon and night
- Fertiliser rates adjusted after fortnightly leaf test analysis
- Each Greenhouse treated as a unique entity

Irrigation & Fertigation Scheduling Equipment



Other Equipment Considerations

- Irrigation & Fertigation Scheduling increases plant vigor dramatically and as a result the following need to be controlled;
 - Air flow needs to be increased to control humidity, temperature and incidence of disease and fungal pathogens
 - Calcium and manganese levels need to be adjusted when temperatures are over 30°C
- Fogging can assist with humidity and temperature control
- Link all sensors to a centralised climate control system
 - Sensor ranges need to suit individual greenhouse specifications

Plant Uniformity and Health



Crop Statistics

- Water use decreased by 25%
- Fertiliser use decreased by 30%
- Foliar disease decreased from 75% to 5%
- Foliar sprays decreased from 7 to 2 per crop cycle
- IPM efficiency increased from 65% to 90%
- Blossum End Rot decreased from 35% to 1%

Crop Statistics

- Crop Yield increased from 7.53kg/m² to 18kg/m²
- Individual fruit weight increased from an average of 170g to a new average of 220g – 250g
- Shelf Life of Fruit increased by 5 – 6 days
- Crop Production Lifespan increased from 40 weeks to 48 – 50 weeks
- Market Price Premium of an extra \$1 / kg

Plant Yield, Quality and Height



Post Harvest Handling

- All fruit picked are chilled for 24 hours before grading
- Grading is done in a temperature controlled cool room



Post Harvest Handling

- All fruit is packed in 10kg boxes in a temperature controlled cool room

