



Nitrogen Fertigation Frequency for Drip Irrigated Broccoli

- Dr. Jim Walworth
- Dr. Tom Thompson
- Mr. Scott White
- Mr. Greg Sower

Objectives

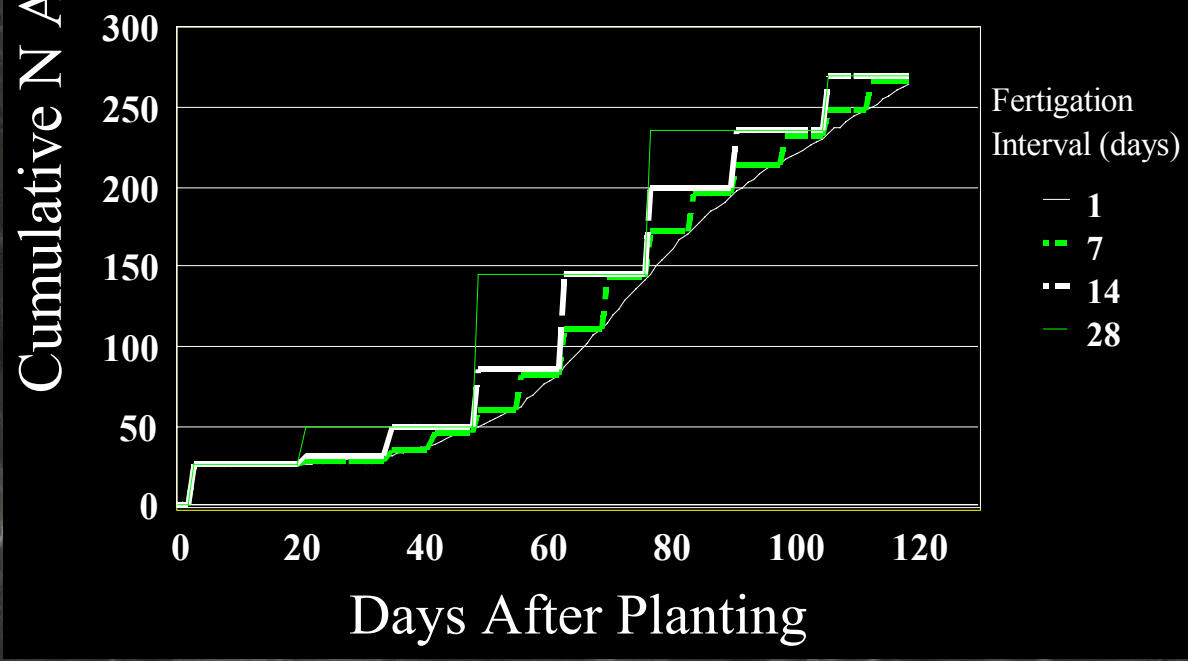
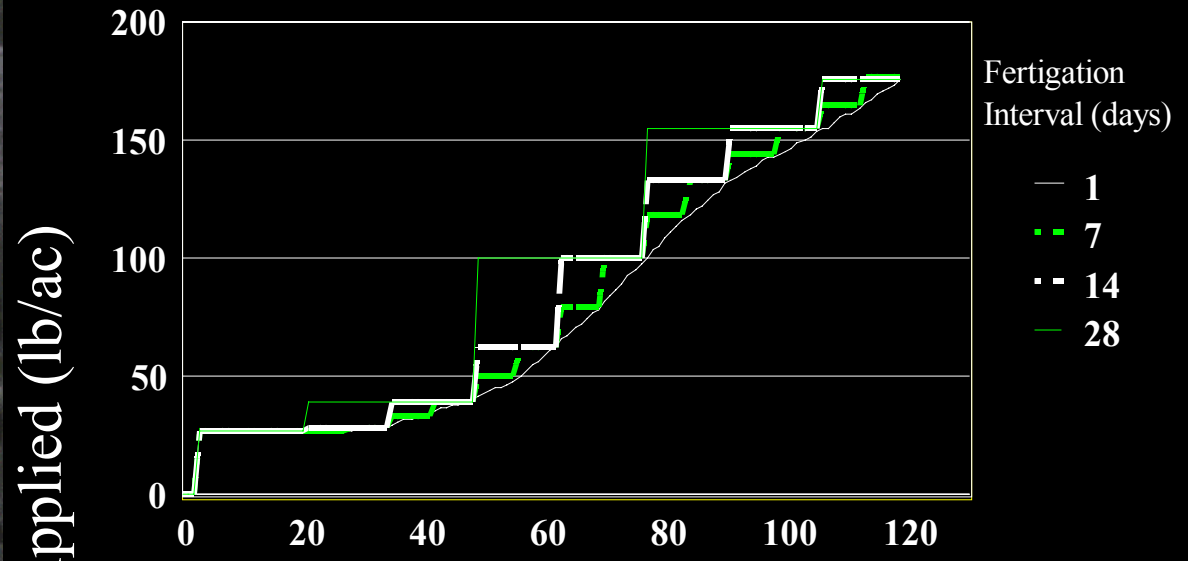
- Determine effects of nitrogen rate and frequency on
 - yield
 - quality
 - nitrogen use efficiencyof subsurface drip-irrigated broccoli

Experimental Methods

- Field experiments at Maricopa Agricultural Center during 1998-2000 growing seasons
- Drip tubing buried 8" deep in raised beds
- 'Marathon' broccoli direct-seeded, thinned to 40,000 plants/acre
- Irrigated to maintain water tension at 8 to 10 cbars
- Nitrogen applied through irrigation system

Nitrogen Treatments

- Nitrogen application rates
 - 1998-1999: 176 or 268 lbs N/a
 - 1999-2000: 223 or 312 lbs N/a
 - 2000-2002: 223 or 312 lbs N/a
- Fertigation frequency
 - Daily
 - Weekly
 - Bi-weekly
 - Monthly

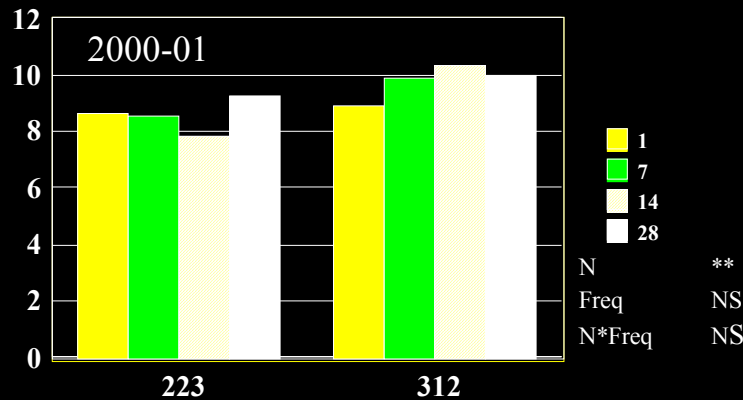
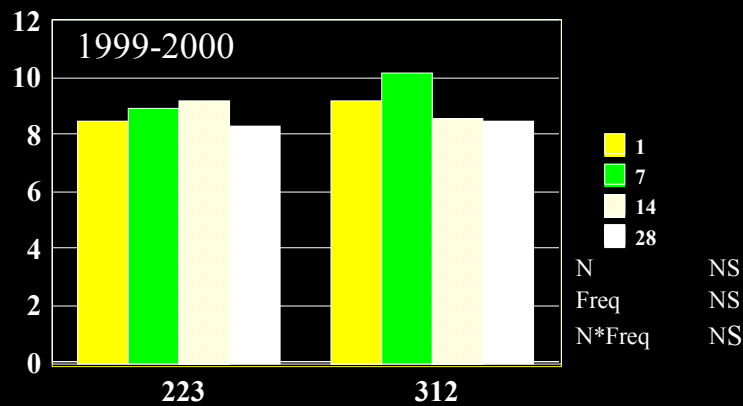
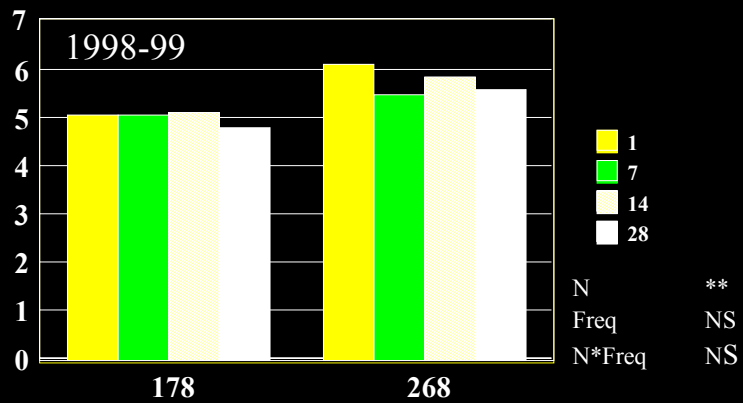


Data Collection

- Broccoli heads hand harvested
 - Trimmed to 'US Fancy'
 - Graded for diameter, weight, discoloration, hollow stem
- Fertilizer N use efficiency
 - (N uptake in treated plots – N uptake from unfertilized control plots)

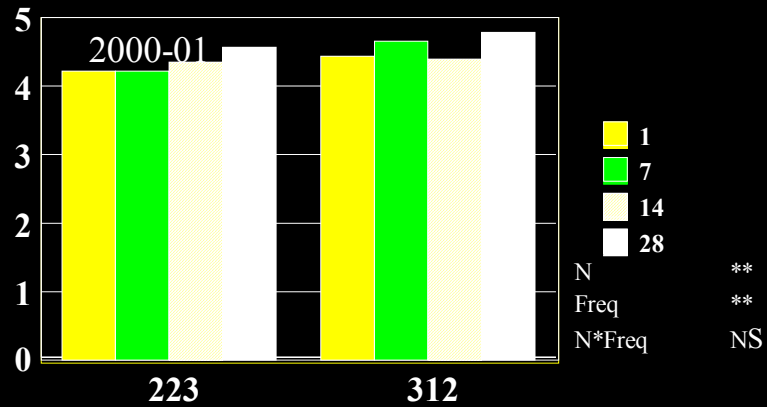
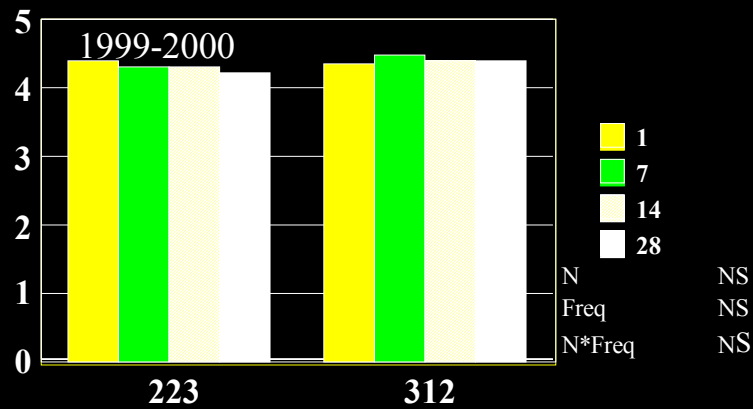
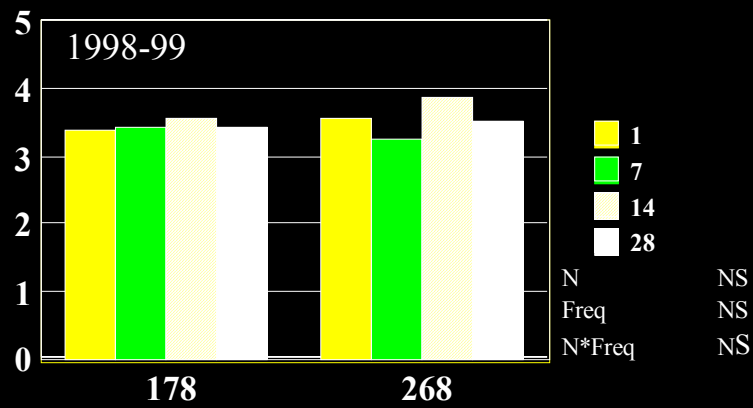


Marketable Yield (tons/ac)



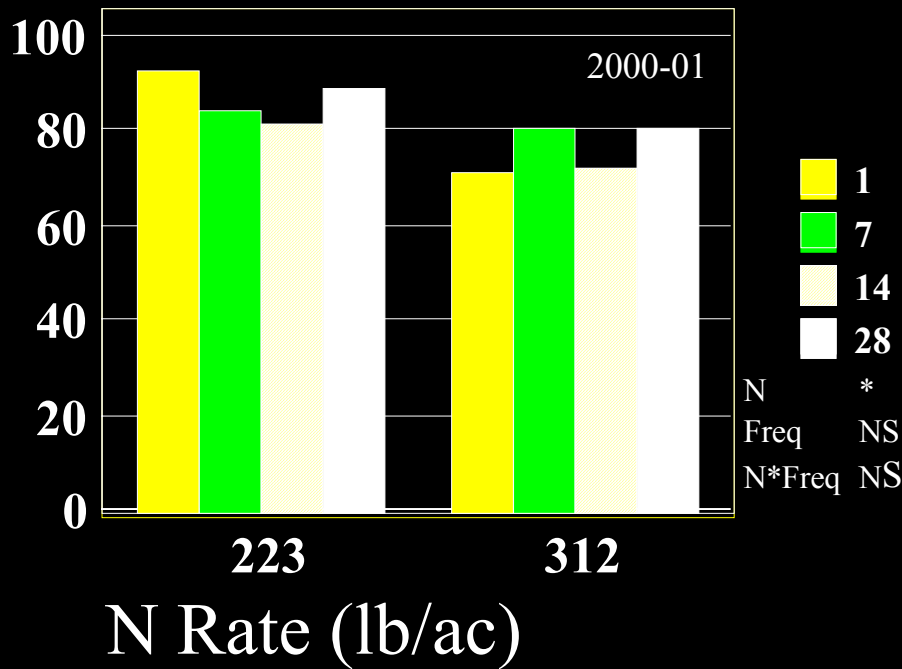
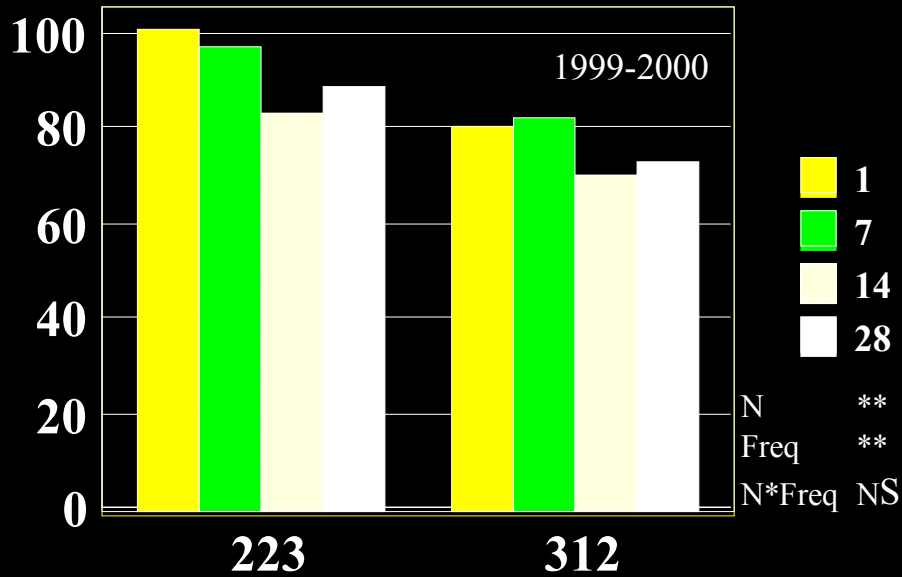
N Rate (lb/ac)

Head Diameter (in.)



N Rate (lb/ac)

Fertilizer N Use Efficiency (%)



N Rate (lb/ac)

Conclusions

- When N was applied daily, weekly, bi-weekly, or monthly to subsurface drip-irrigated broccoli
 - Broccoli yield and quality were affected by N rate, but there were almost no significant effects from fertigation frequency
 - High-frequency fertigation is not an important management variable sandy loam or finer textured soils
- More work is needed on coarser soils and on summer crops

