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Amherst

2023 Update Mtg Jan 26: irrigation and Nitrogen Fertilizer

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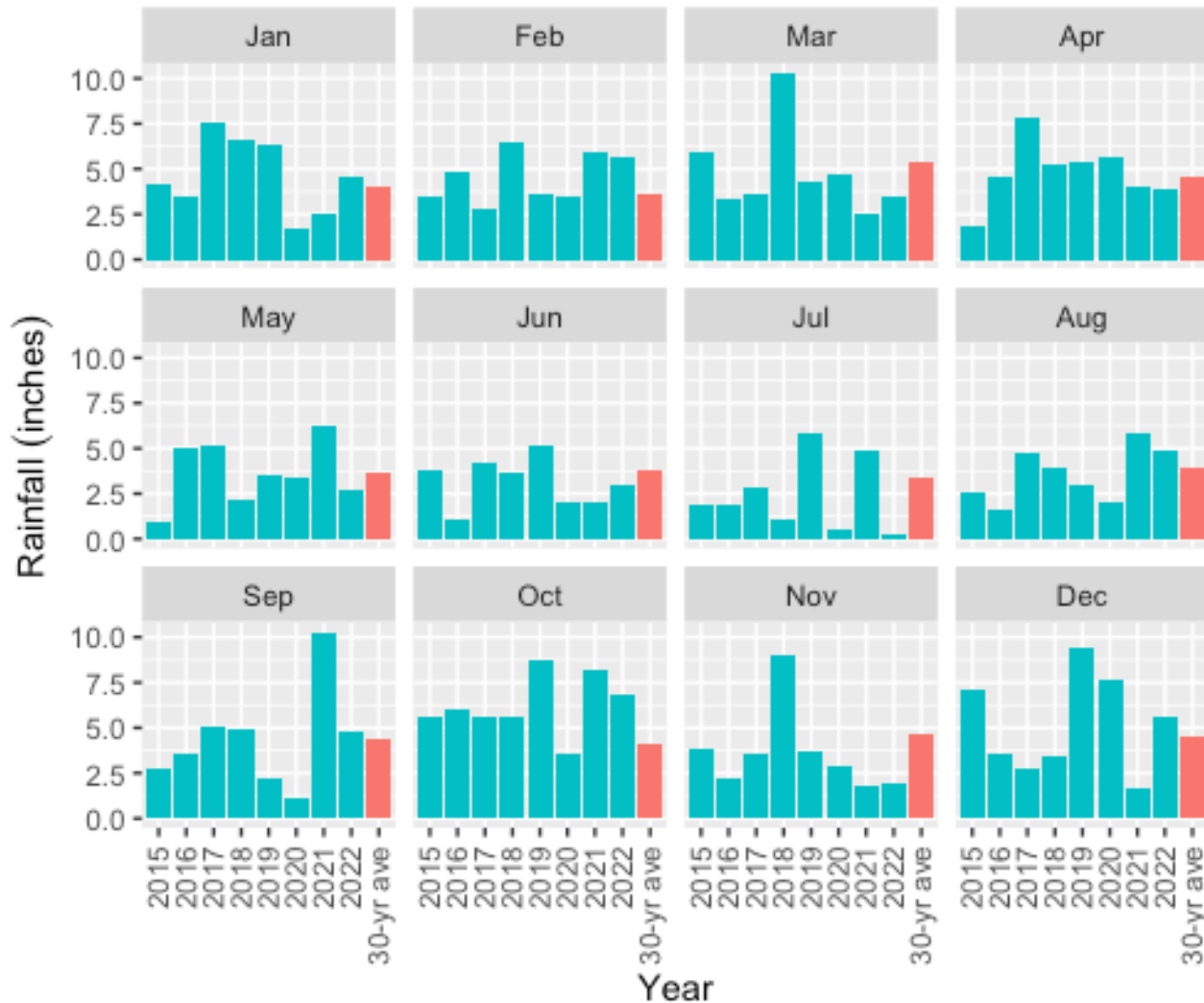
Irrigation and Fertilizer Nitrogen in Cranberry Production

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and Casey Kennedy

January 26, 2023

Research Projects

1. Thermal Models for Spring Frost Management – we are working with three models [Dee Model, WI(41) and WI(41-85)]
2. Optimal fertilizer N rates in 2nd Gen Hybrids
3. Irrigation Management using tensiometers and other sensors
4. Multidisciplinary and multistate – Systems Approach to Managing the Expression of Cranberry Fruit Rot (SAME)
 - to systematically evaluate the effect of soil fertility and environmental stressors on fruit chemistry and symptom development

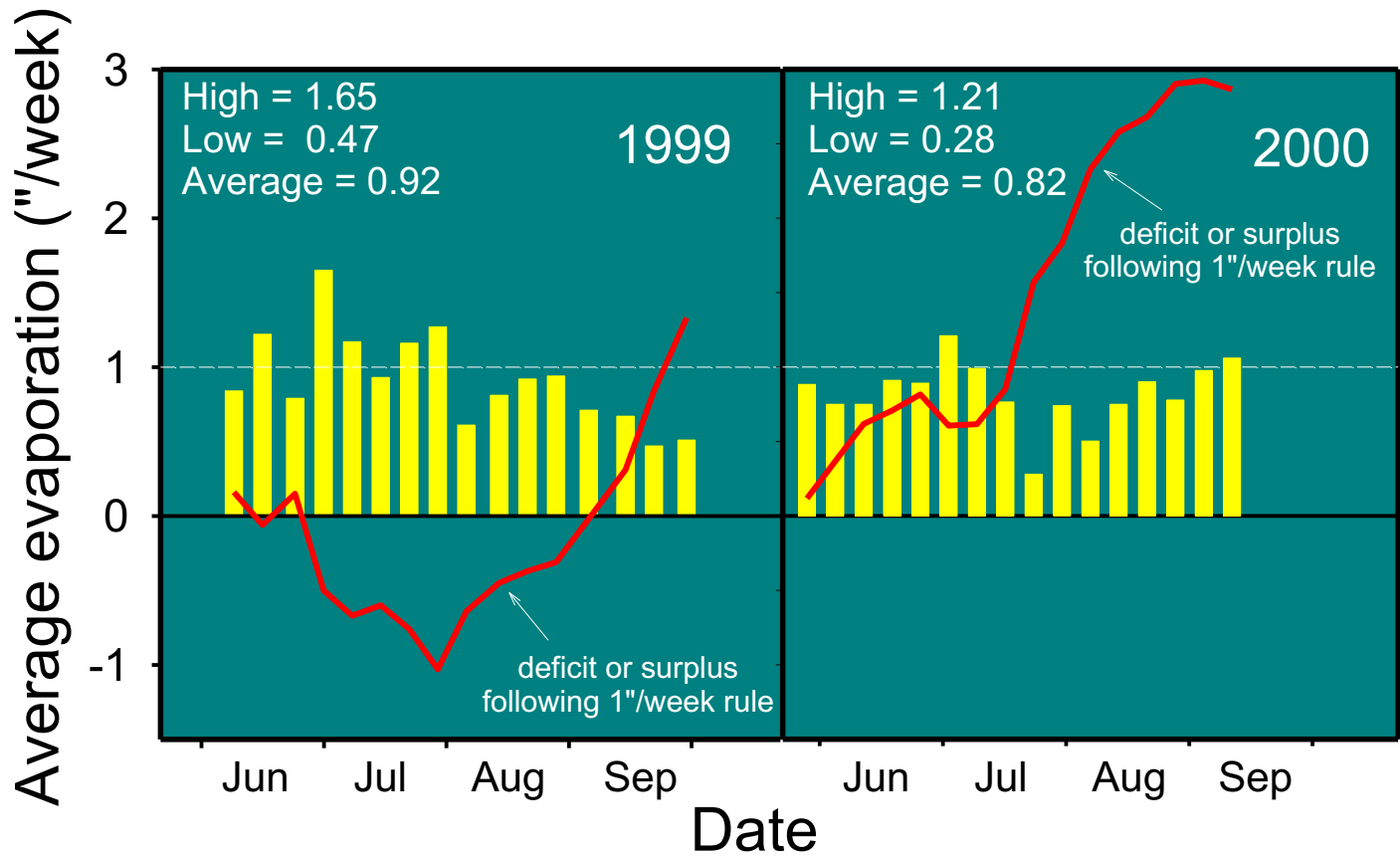


- May through July had below average rainfall
- July had 5 days of precipitation totaling 0.26 inches
- 2022 ended with rainfall deficit of 2.25 inches

Weather Summary

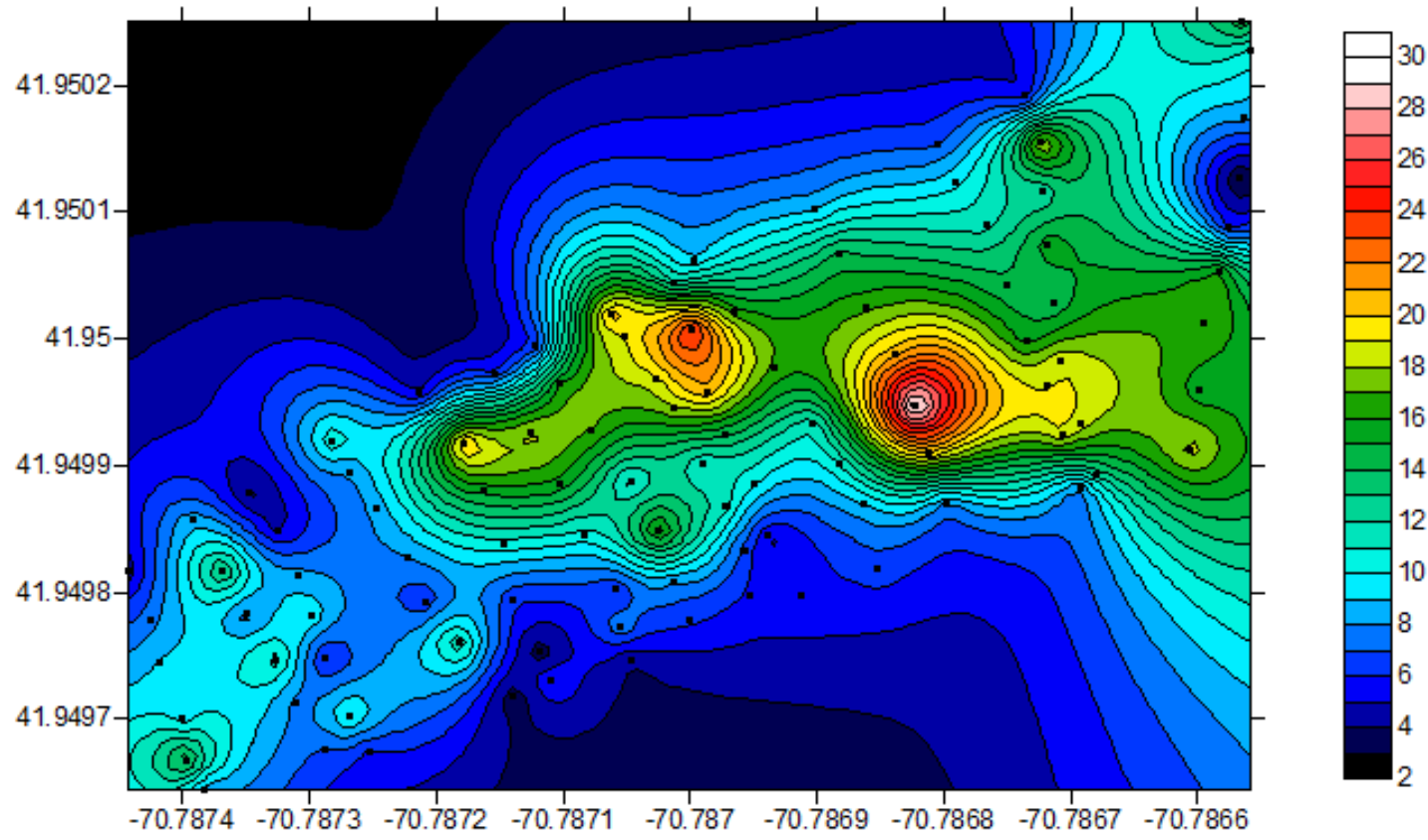
1. Winter snow (Dec-Feb) = 43 inches(**27 LTA**) > 12 (vs. 2021). LTA = long term average (30-year average)
2. 2022 rainfall was 2.25 inches below LTA
3. Winter, Spring & Summer precipitations were below average; Fall had above average precipitation
4. Summer had 8.2 inches of rainfall; 2.8 inches less than LTA; **only 0.26 inches in July, 3.1 inches < LTA**
5. Max Temp = **97°F** on July 21st
6. Five official heat waves (3 consecutive days > 90°F) on July 20-22; 23-25; August 3-5; 6-8; 20-22).

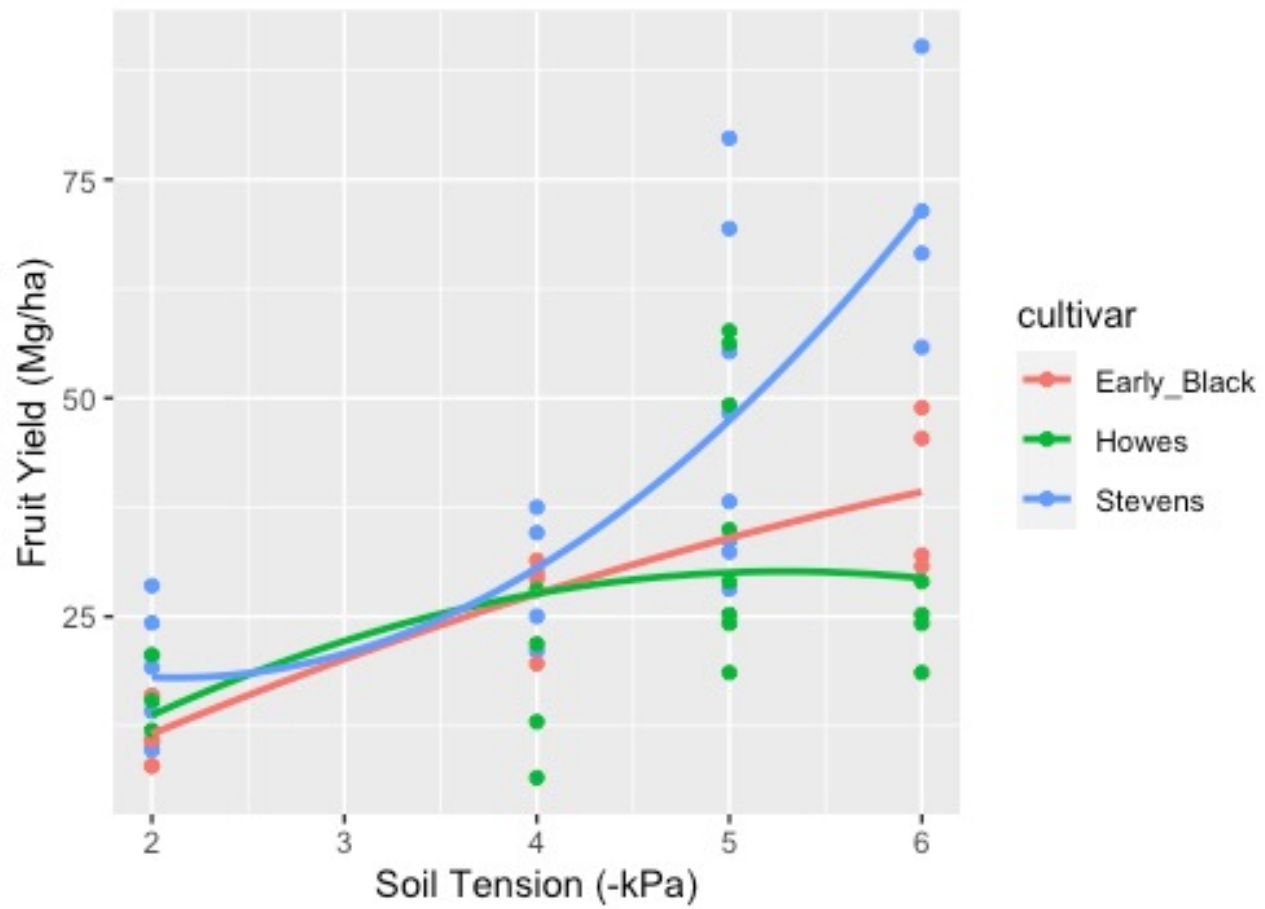
Evapotranspirative Demand on a Cranberry Bed

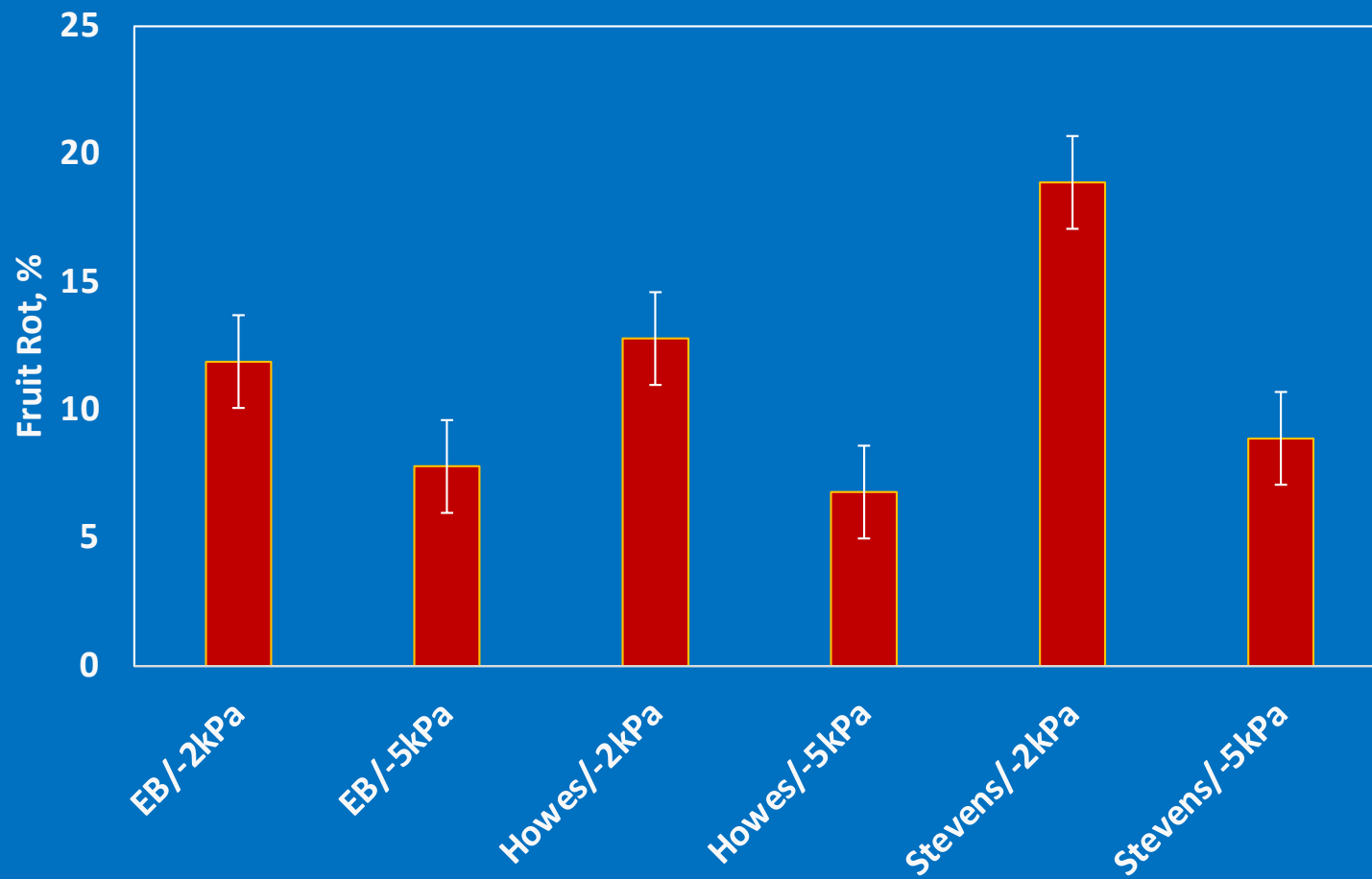


Soil Moisture Variations in a Cranberry Bed

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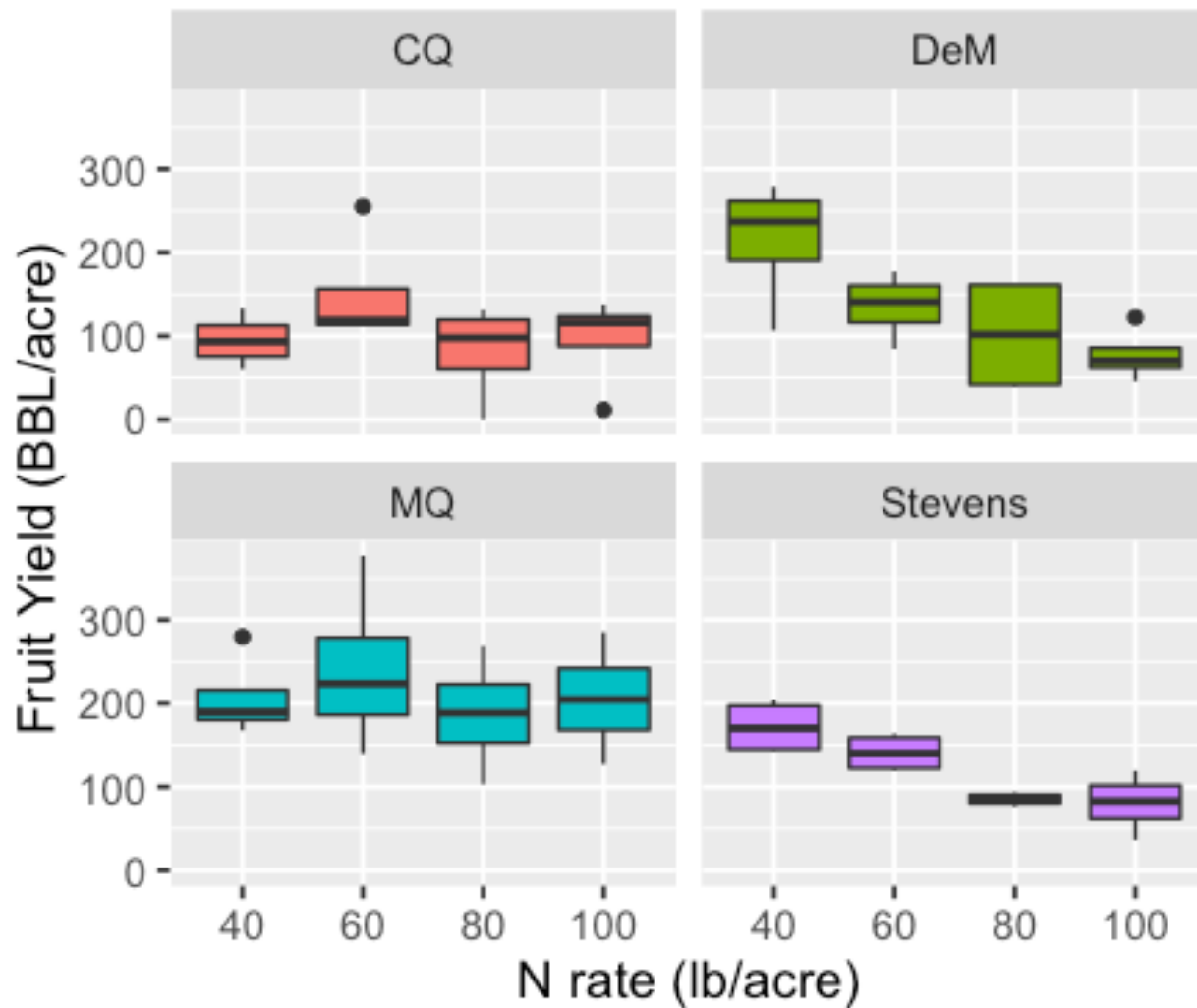




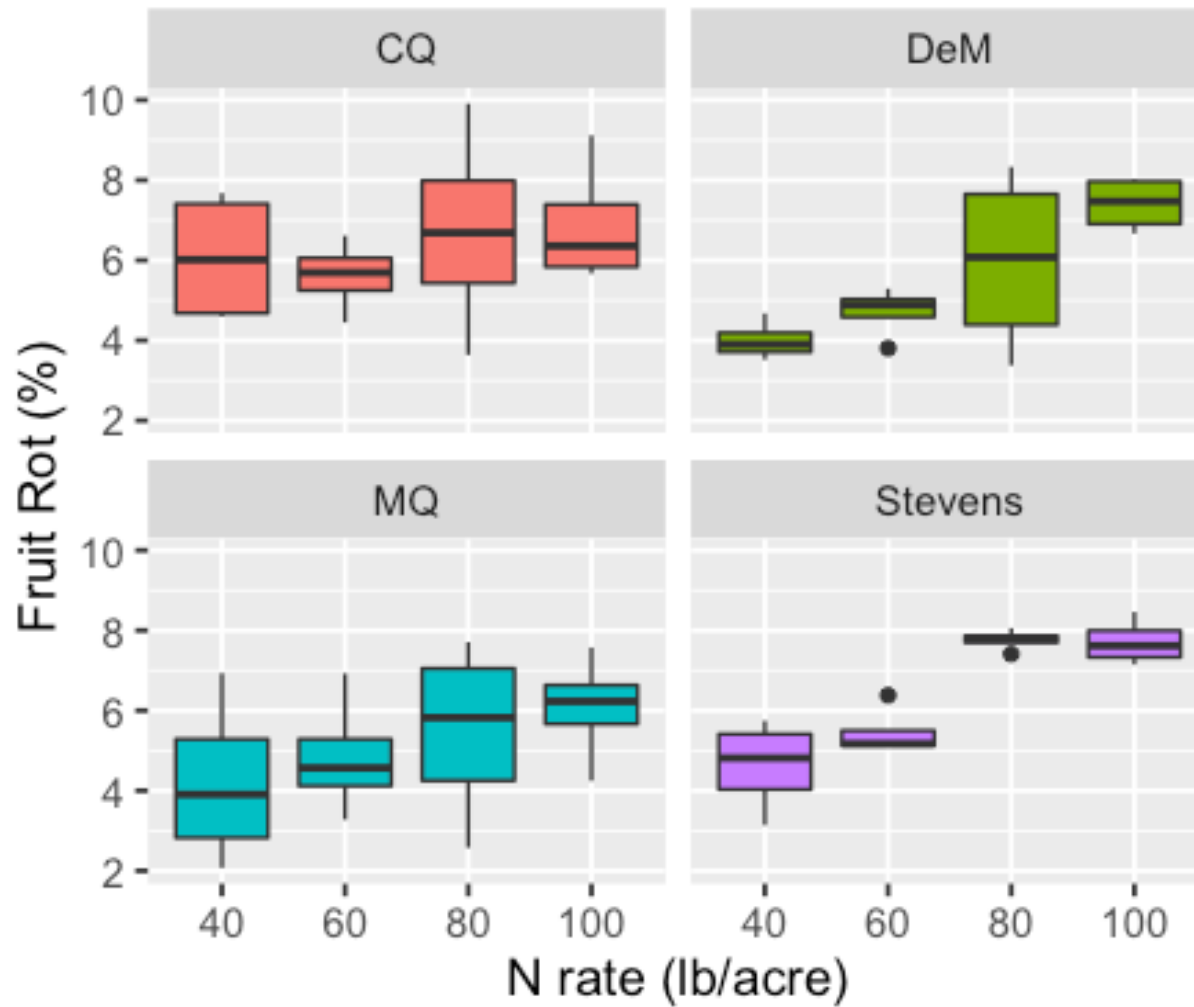


Optimal Fertilizer N rates for 2nd Generation Hybrids

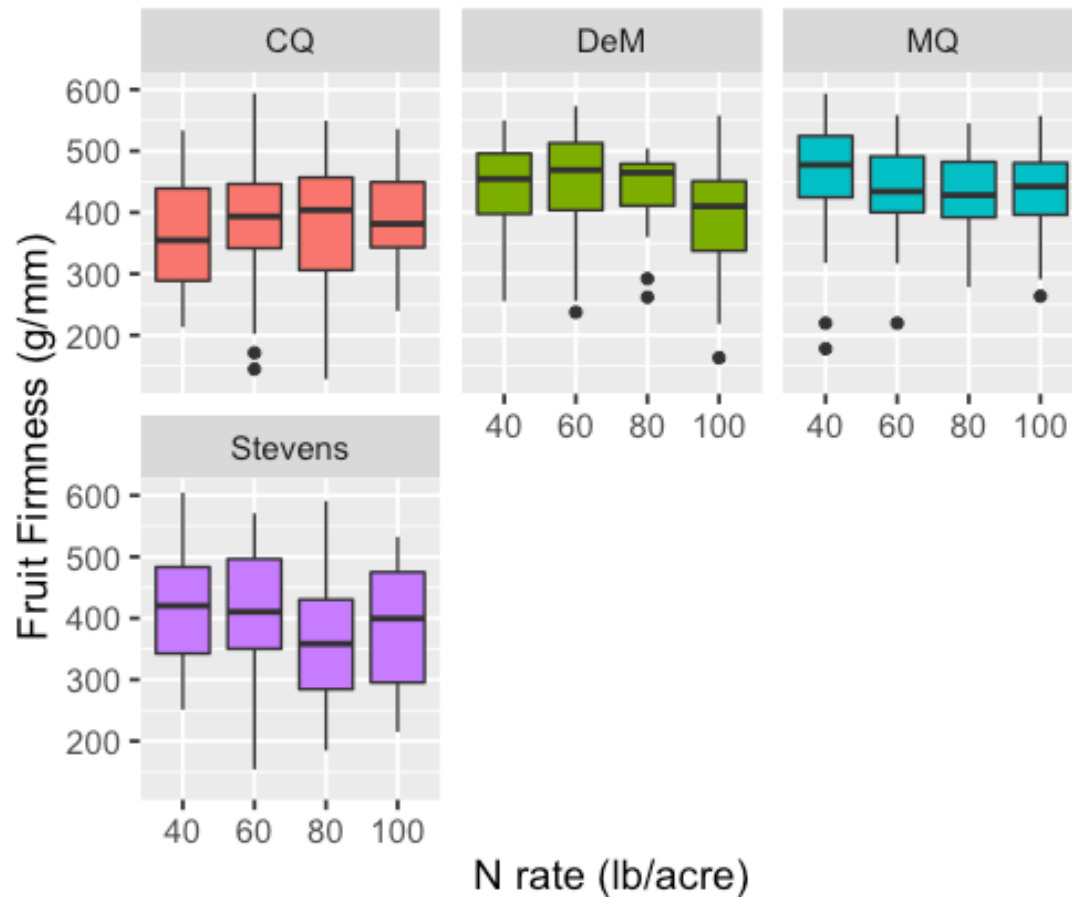
- N rates for natives and 1st generation hybrids are known
- No such rates exist for 2nd generation hybrids - Mullica Queen, DeMoranville or Crimson Queen
- 4 N rates (sub) x 4 cultivars (main) x 4 replications in a RCBD at State Bog



- Yield decreased with N rate in DeM & Stevens
- Yield increased slightly with N for CQ & MQ



Fruit rot increased with N rate for all cultivars



- Declined with N rate for ST, DeM and MQ
- CQ firmness somewhat increased with N rate
- Firmness measured 30 days after harvest
- Fruit was unrefrigerated

SUMMARY

1. The grower practice of supplying 25 mm of water a week resulted in an average tension of <-2 kPa
2. Fruit rot was reduced & yield increased in beds managed using tensiometer as trigger for irrigation (~-5 kPa).
3. Fruit rot increased in all cultivars with increase in N rate.
4. Fruit firmness decreased in storage and somewhat with N rate
5. Fruit yield decreased with N rate in DeM and Stevens