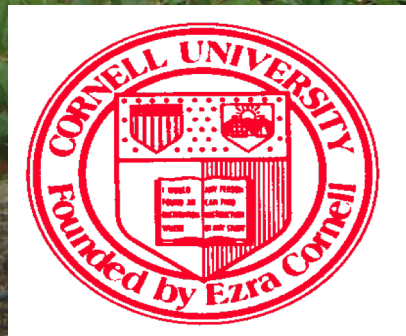


# Use of Plant Growth Regulators to Control Russet and Improve Color

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# Control of Russetting on Sweetango and Other Varieties

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- Russetting can be induced by
  - frost,
  - humidity,
  - micro-organisms,
  - chemical damage
- Anything that damages the skin of the apple will cause russetting
- The fruits are most susceptible from petal fall until 4 weeks after petal fall
- An
- As the fruit grows the sub epidermal cells must produce wax to keep the fruit surface covered. The wax layer is composed of plates of wax (like tectonic plates of the earth) As the fruit grows the subepidermal cells fill in the gaps with was.
- If those cells are damaged by frost, chemicals or yeast then they cannot produce enough wax and the plant produces suberin which is russetting.

# Control of Russetting on Sweetango y Other Varieties

- Some fungicides are better than others
  - Polyram causes less russetting,
  - Captan causes more russetting)
- GA cause expansion of cells in the skin. They work best if the cells are not damaged and works poorly if the cells are damaged
- Our 3 years of trials with Sweetango showed that
  - Provide gave good control of russetting,
  - Prohexadione Ca (Apogee) did not reduce russetting
  - Fungicides had little effect
- Our program consisted of:
  - 4 sprays of Provide (20ppm) beginning at petal fall and then every 10 days
- Our results also showed that in a frost year Provide did not control russetting.

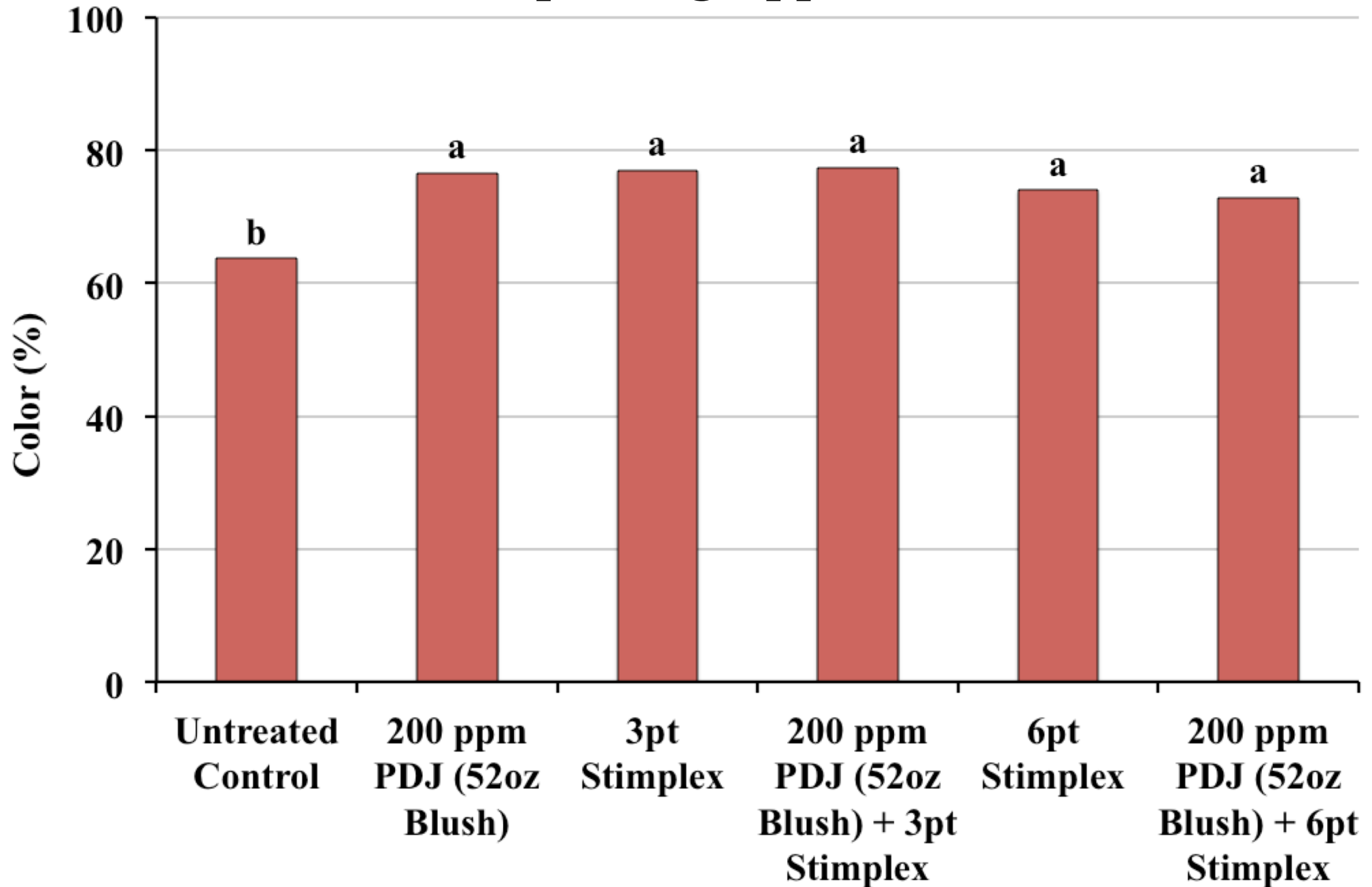
# Control of Russetting on Sweetango y Other Varieties

- Provide sprays cause thinning with Sweetango which has a high natural drop due to high ethylene production by the flowers and fruitlets (Often the use of Provide results in a light crop thus the use of Retain to increase set)
- Provide sprays on Golden Delicious do not cause much thinning but they make the tree more sensitive to NAA. Without a Provide program we suggest high rates of NAA to thin Golden (20ppm) but with Provide we suggest a lower rate of 10ppm

# PGR sprays to Improve Fruit Color

- Ethrel (300ppm) improves fruit color if applied 1 week before harvest but stimulates ripening and excessive drop 10 days after application.
  - If NAA is mixed with Ethrel then drop can be delayed 10 days
- AVG (Retain) and MCP (Harvista) delay color development
- Potassium foliar sprays ( $K_2SO_4$ ) can improve fruit color but we have had little success
- ACC (ethylene precursor) is being evaluated for color improvement (not yet registered)
- Blush is a plant growth regulator featuring a jasmonate PGR (active ingredient prohydrojasmon PDJ)
  - We found little response when applied at 3 weeks and 1 week before harvest of Honeycrisp in 2014
  - Its response was improved by combining with Stimplex (algae extract that has low levels of hormones)
  - Its response was improved by waiting for application until fruit are entering maturation. Reality research has shown that using the DA meter to time application date has improved results with Honeycrisp

# Improving Apple Color



2 applications each treatment – 4 and 2 weeks before harvest



**Untreated control**

**Blush or Stimplex  
(4 + 2 WBH)**



**No effect on fruit size**

**No effect on fruit drop**

**No effect in fruit quality (SS and firmness)**



# Use of Retain to reduce internal flesh pigmentation (bleeding) of Rome and Idared

- Internal flesh pigmentation increased as the season progressed but some blocks did not ever develop bleeding.
- Retain spray reduced internal flesh bleeding significantly.
  - The half rate was as good as the full rate.
  - The best timing was mid September.







Questions?