APPLICATION CONSIDERATIONS FOR HARVEST EXTENSION WITH PGRS

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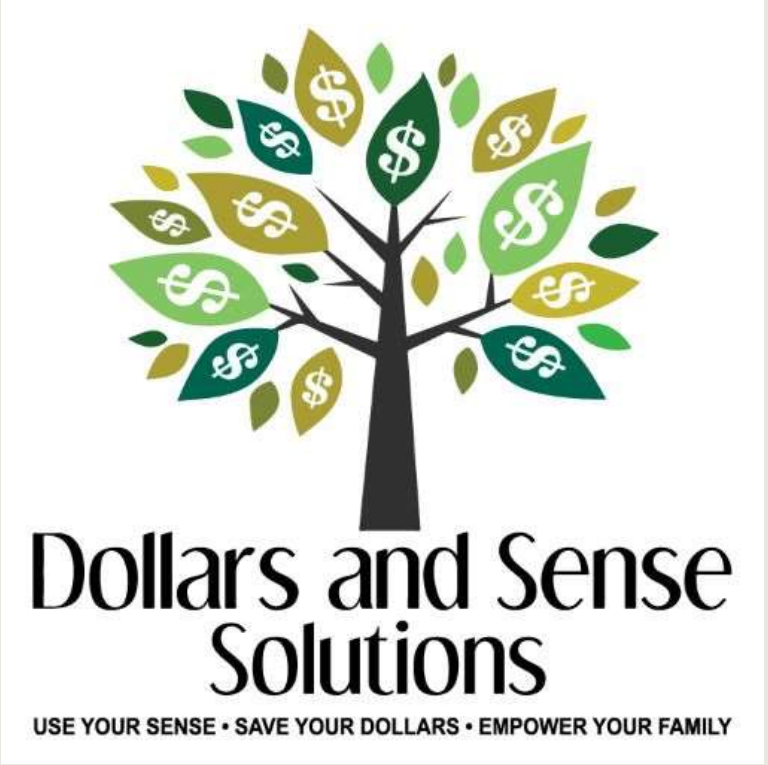
I KNOW WE'RE IN MAINE BUT…

HARVEST MANAGEMENT

- What are some of the most crucial (expensive) decisions that you can make during the season?
- What are the factors that you need to consider when making a harvest management decision?
- Do you plan to store fruit long term or short term?
- How many apples do you think you have?
- The wholesale market is heavily driven by color
  - *Where are you on color development*
- Who knows what drives a pick-your-own customer
- What is the weather going to be like?

PREHARVEST DECISIONS

- Applications used for harvest management and/or fruit quality are expensive
- Most blocks getting PGRs should be high quality and easily marketable
- BUT… even on some PYO blocks, it can make sense. How many good apples on the ground pays for $200 - 400/acre?
- I don't envy you for the complex decisions that must be made at harvest.
- How do you plan to fill your rooms?
- **If it ain't broke, don't fix it**



WHAT APPLICATIONS CAN YOU USE FOR HARVEST MANAGEMENT?

There are many products that you can apply preharvest for harvest quality but we'll stick to the PGRs

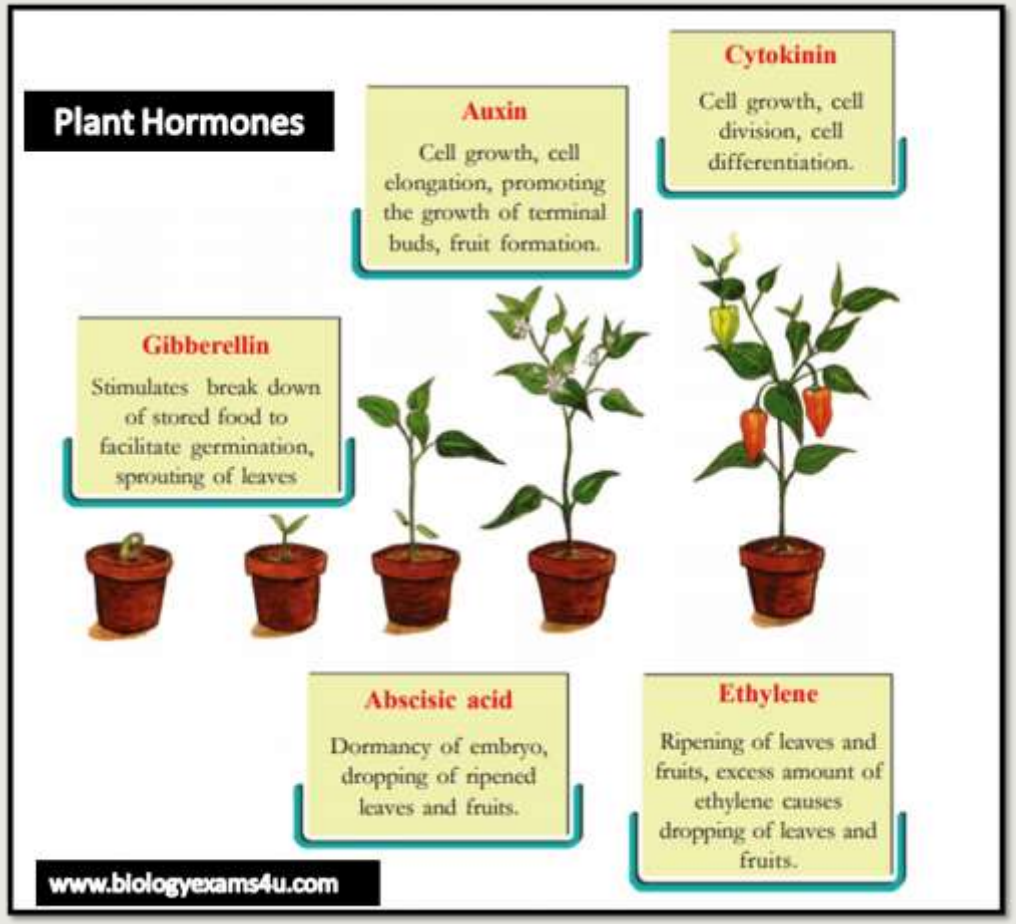
- **Harvista** – blocks ethylene receptors on fruit
- **NAA** – inhibits fruit drop
- **Retain**– inhibits the building blocks of ethylene
- Ethephon

PLANT HORMONES

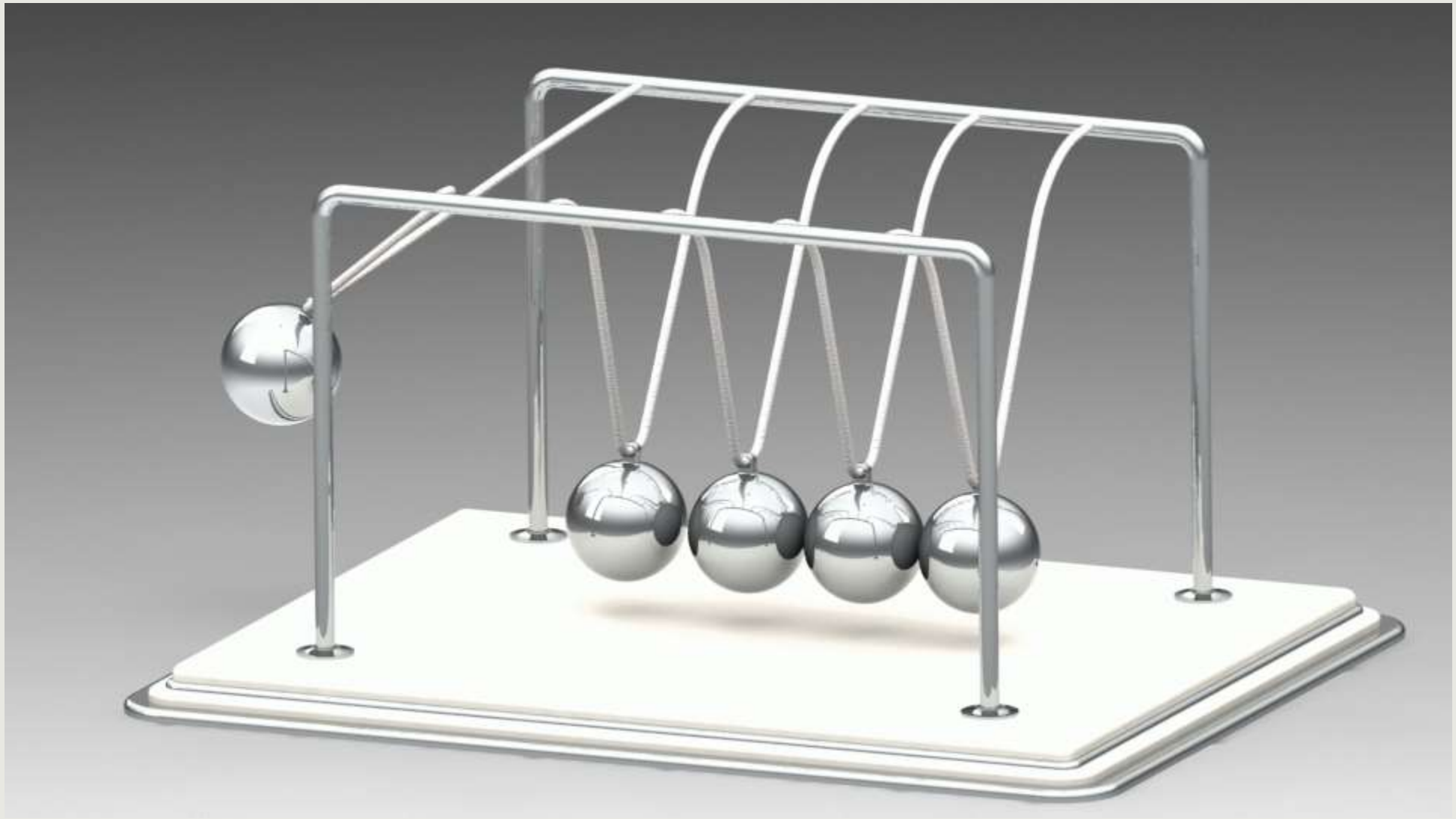
There are five main types of Hormones in plants.

- Auxin (NAA, NAD/AmidThin)
- Abscisic acid (ProTone)
- Cytokinins (6BA or MaxCell)
- Gibberellins (Promalin)
- Ethylene (Retain and Harvista)

- Brassionosteroids, jasmonates, etc.



PLANT HORMONES



NAA

The active ingredient in NAA products is 1-napthaleneacetic acid (NAA) which acts as a synthetic auxin. These products work by interfering with the enzymes that create the abscission layer causing fruit drop.

- Fruit maturity does NOT slow down and may actually speed up under warm conditions

- Use at 4 fl oz/acre or 10 ppm
- Expect drop control for 7-10 days
- About $15 for 4 fl oz
- Use with a surfactant for better uptake
- 2 day PHI

A LITTLE BIT ABOUT ETHYLENE

- Ethylene is naturally produced hormone inside all plants and is commonly referred to as the ripening hormone.
- Stimulates fruit softening and the formation of an abscission layer in the stem. (cellulase and polyglacturonase).
- Cultivars have varying degrees of sensitivity to ethylene; think McIntosh vs Fuji
- **Factors affecting ethylene could be;**
  - *Nutrient status, crop load, pest pressure, water status, temperature*

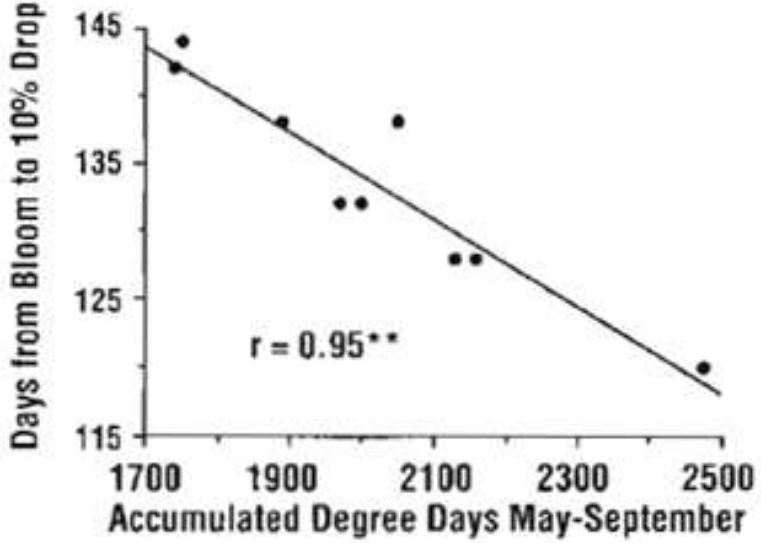


Fig. 1. Relationship between accumulated degree days (daily mean temperature minus 50°F) during the growing season and the number of days from full bloom to 10 percent drop of sound McIntosh apples. (From M.B. Hoffman, Cornell Univ.)

A LITTLE BIT ABOUT ETHYLENE

- The active ingredient in **Retain** is aminoethoxyvinylglycine (AVG) and works by inhibiting the building blocks of ethylene. The active ingredient in **Harvista** is 1-methylcyclopropene, which works by blocking ethylene receptor sites on the apple.
- Ultimately Retain and Harvista are doing the same thing in that they both limit the apple from sensing ethylene.

- Harvista – blocks Ethylene receptors on fruit
- Retain– inhibits the building blocks of ethylene

RETAIN

- Retain has been around for over 20 years and the research has been well established

- Delays maturity, enhances fruit quality, may delay color development
- A single pouch can cost up in 2023 to $350/acre
- Consider use rates of ½ pouch to 2 full pouches per acre
- Requires an OS surfactant and lots of defoamer
- Slow drying conditions are best
- 7 day PHI

RETAIN

General recommendations for use of Retain- estimated untreated harvest dates are for mid-Hudson Valley

Cultivar	Expected Untreated Harvest Date	"Best" Strategy from options above	Application date(s)	Notes
Gala	8/28	4.) use 1/2 rate	8/14	Early app may delay color
Honeycrisp	9/7	4.) use 1/3 rate	8/14	Early app date may delay color
McIntosh	9/7	1.) or 2.)	8/10 or 8/17 & 8/24	Use 2/3 rate for Strategy 2
Jonamac	9/14	1.) or 2.)	8/10 or 8/17 & 8/24	Use 2/3 rate for Strategy 2
Jonagold	9/14	5.)	8/24 – 8/31	Reduces greasiness
Cortland	9/21	5.)	8/31 – 9/7	Reduces greasiness
Macoun	9/21	3.) or 5.)	9/7	Apply later to minimize drop
Empire	9/21	2.) or 3.)	8/31 & 9/14	Good for holding longer
Red Delicious	9/28	2.) or 3.)	9/7 & 9/21	Good for holding longer

**Adjust for your local anticipated harvest dates. Weather conditions may change expected harvest dates.

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HARVISTA

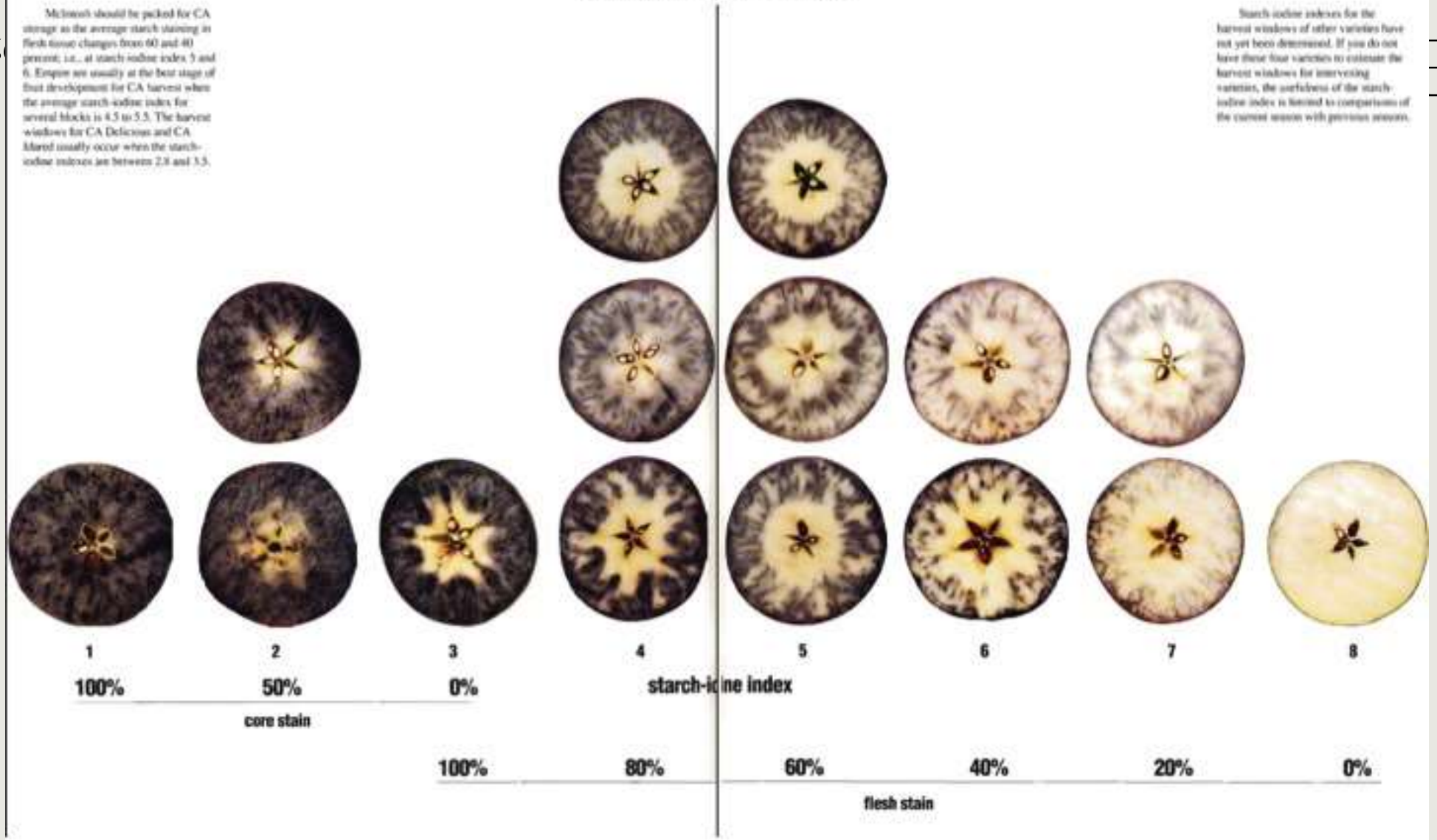
- Harvista is much newer to the market (10 years) and has also been researched in field and lab trials

- Delays maturity, enhances fruit quality, less problems associated with delaying color development
- Generally applied at 1 gallon per acre ($300 - $400/gallon)
- Consider use rates of ½ pouch to 2 gallons per acre
- Current application requires dosatron-like system mounted on your sprayer – MCP is sprayed but volatilizes quickly
- Slow drying conditions are best
- 3 day PHI

HARVISTA

- Is based on up to date starch index
- To a lesser degree brix and pressure
- Blocks of the same cultivar but on different rootstock and or in different soil conditions may vary
- Once application is made, consider the range of fruit that exists on the tree
- 1st pick, 2nd pick, 3rd pick

Cornell
Starch-Iodine Index



Blanpied, G.D. and S.J. Silsby. 1992, Predicting Harvest Date Windows for Apples. Cornell Cooperative Extension. Informational Bulletin 221.

HARVISTA

WHICH TO CHOOSE?

- Depends on many factors of course
- NAA v. Harvista v. Retain
- Where is NAA effective (only a few spots)
- Long-term decisions are best reserved for Retain
  - *Consider the different rates and ease of application*
  - *Set it and forget it on tough to reach blocks*
- Use Harvista to make decisions with less time
  - *Applying later can allow for better color development*
  - *React to changing weather conditions*

QUESTIONS