ROOTSTOCKS & SITE PREPARATION FOR HONEYCRISP
Honeycrisp

- Alternate bearer
- Susceptible to bitter pit
- Susceptible to scald
- Multiple harvests
- Store at warmer temperatures (36ºF)
- Honeycrisp yellows
- Preharvest drop
- Over cropping leads to weaker growth
- Low cropping leads to bitter pit
- Fruit has some resistance to Apple Scab
Honeycrisp/M.26 supported with 2 wires
Laser Ablation Tomography (LAT)

• 50 µm slices of union tissue
• Traditional light microscope analysis
• Observed for qualitative differences between weak (M.26) and strong (M.7) unions of Honeycrisp.
• Cripps Pink & Envy/G.41
Incompatibility between Scion & Rootstock

- Fiber cells found at weak graft unions had thinner cell walls
- Weaker unions had a higher percentage of parenchyma tissue and less fiber tissue
- Over production of disorganized parenchyma tissue in weaker unions
Ideal Rootstock?

- Desired size control
- High yield efficiency
- Precocious
- Survives!!
  - Insect & disease resistance
  - Tolerates environmental stress
  - Does not break
Size control will depend

• Site
  — Virgin vs. Replant site

• Growing system
  — Spacing

• Cultivar
  — Low vigor Honeycrisp

• Bud union height
Problematic?

• B.9 too weak?
• M.26 brittle union, fire blight prone. Replant problems
• G.30 has brittle graft union
• G.202 50% larger than M.9
Fear Not!

• M.9 Clones (weakest to strongest)
  – M.9 Flueren 56
  – M.9 NAKB T337
  – M.9 EMLA
  – M.9 RN 29
  – M.9 Pajam 1 (Lancep)
  – M.9 Pajam 2 (Cepiland)
New Possibilities

• G.935
• G.969 – Semidwarf
  >M.26, <M.7 (+WAA)
• G.210 – Similar to M.7, replant situations?
• G.890 - ± M.7
• Bud 10 – Slightly larger than M.9T337, cold hardy, FB tolerant, wide angle branches
G.935

- M.26 size
- Needs support?
- FB resistant
- *Phytophthora* & ARD tolerant
- Cold hardy
- Not resistant to WAA
Geneva 969

- Tested as CG.6969
- Between M.26 & M.7
- Similar in size to G.935 & G.222
- Resistant to WAA, FB, *Phytophthora*
- Free standing?
- Less biennial bearing
Geneva 210

- Tested as CG.6210
- Between M.7 & MM.106
- Resistant to WAA, FB,
- Tolerant to ARD
- Not free standing
G.890

• Tested as CG.5890
• Slightly larger around M.7 size
• Resistant to WAA, FB, *Phytophthora*,
• Free standing (?)
• Medium density plantings
B.10

- Tested as B.62-396
- Yield & production similar to M.9
- Slightly larger than M.9 T337
- M.27 x Robusta
- Tolerant to FB
- Cold hardy
2014 NC – 140 Rootstock Trial

• Honecrisp

• 14 Sites in U.S. & Canada
  – ID, IN, MA, ME, MI, MN, NJ, NY, Ontario (2), PA, VA, WA, WI

• Rootstocks (8)
  – G.890, G.969, M.26 EMLA, M.9 T337, V.1, V.5, V.6, V.7
Avg. Yield/Tree of Honeycrisp 2nd If.

Efficiency, g/TCSA

Crop Load,#/cm2

2015 TCSA Honeycrisp

Square Centimeters

Efficiency, g/TCSA

Crop Load,#/cm2

Penn State Extension
Tree size and yield efficiency of ‘Honeycrisp’ apple trees on several Geneva® rootstocks over 7 years at Hilton, NY.
Biennial bearing of ‘Honeycrisp’ apple trees on several Geneva® rootstocks over 7 years at Hilton, NY.
Take a Slightly Different Track

- Horticulture Actions to Enhance HC Establishment
How many saw this headline in January 15 GFG?

• Volume tripled in 5 years

Honeycrisp not listed prior to 2010
Site Selection & Preparation Becomes Critical!
Biggs et al.,

- Rotational treatments of Tall Fescue
  - increased number of nematode control organisms
  - higher soil organic matter
  - elevated soil fertility
  - decreased N leaching
Braun et al.,

• Looked at different establishment treatments on Honeycrisp trees
• Addition of compost (organic matter)
  – had a positive effect on yield in each of the first 3 years
  – tree size and yield efficiency in the 3rd year.
• Addition of compost or fumigation effect still evident 6 yrs. after planting

(HortScience 45:1702-1707, 2010)
Site Preparation

- Rotate out of orchard 2 to 3 years*
- Kill any perennial weeds
- Soil test and amend
- Increase OM through cover cropping
  - Sudan grass, oats, buckwheat etc...
  - Rape seed as biofumigant
- Establish sod fall prior to planting

*May take that long to get cultivar and rootstock you want anyways!
Demonstration Sites to Increase Organic Matter - 2015

- Soil and nematode samples in early spring
- Cornell soil health test
- Broadcast 50 lbs N/A + P, K, lime
- Sudex planted end of May @ 25 lbs./A
- First flail mowing Mid-July
  - Urea applied @ 53 lb./A (25 lb. N/A)
- Second flail mowing end of August
  - Immediate incorporation
- Incorporated NH₄SO₄ @ 65 lbs./A
- Planted Rapeseed mid-September @ 10 lbs./A
Site Preparation Spring – 2016

- Flail mow & Incorporate rapeseed
  - Soil temp. ≥ 50F
- Plant second crop of rapeseed after 2 wks.
- Flail mow and incorporate
- Soil test in August & adjust
  - Test for nematodes
- Apply 40 lb. urea (18 lb. N/A)
- Plant grass seed K-31 fescue.
Site Preparation 2017

• Line out rows avoiding replanting in old tree row
• Prior to planting kill grass in rows with glyphosate
Planting Trees

- The earlier the better
- Insure good root to soil contact
- Adjust bud union height**
- Water trees after planting
Finally, Get Support System Installed ASAP!
Questions or Comments
Recent Orchard Observations

↓ Weak growing use larger rootstock
↓ M.26, G.30 will break off in high wind
↓ Some indications G.41 may also break