



**Model Apple Plot Presentation
for Soil Health Panel
*Mid-Atlantic Fruit & Vegetable
Convention, 2019***



Twin Springs Fruit Farm *Michael and Jesse King*

- Diversified growers serving 19 Farmers Markets
- Came back fulltime to the farm in late 90s/early 2000s
- Roles: Michael –Market Prep ; Jesse – Production
- “Models for the Future” cooperators in Penn State Extension Beginning Farmer Grant



Barriers to establishing a new orchard


- Limited agricultural land/replant issues
- Nematodes and soil-borne diseases
- Soil health, erosion, terrain
- Problem weeds, broadleaf weeds that serve as reservoirs for viruses

Bio-Fumigation to Overcome Barriers

Model plots: 2-year rotation, sorghum sudangrass and rapeseed

Current trials: 1-year, 2 plantings of caliente





**“Model for
the Future”
Apple Plot**



Bio-Remediation vs No Rotation

The top trellis wire is at the same height in both blocks. Measuring stick is 6 ft.

Started with 12 dagger nematodes/100 cc

Decreased to 0 tolerance level

Left: Goldrush in Model Plot

Bio-remediation for two years with sorghum sudangrass and rapeseed.

Average of 23 apples/tree in 2nd leaf

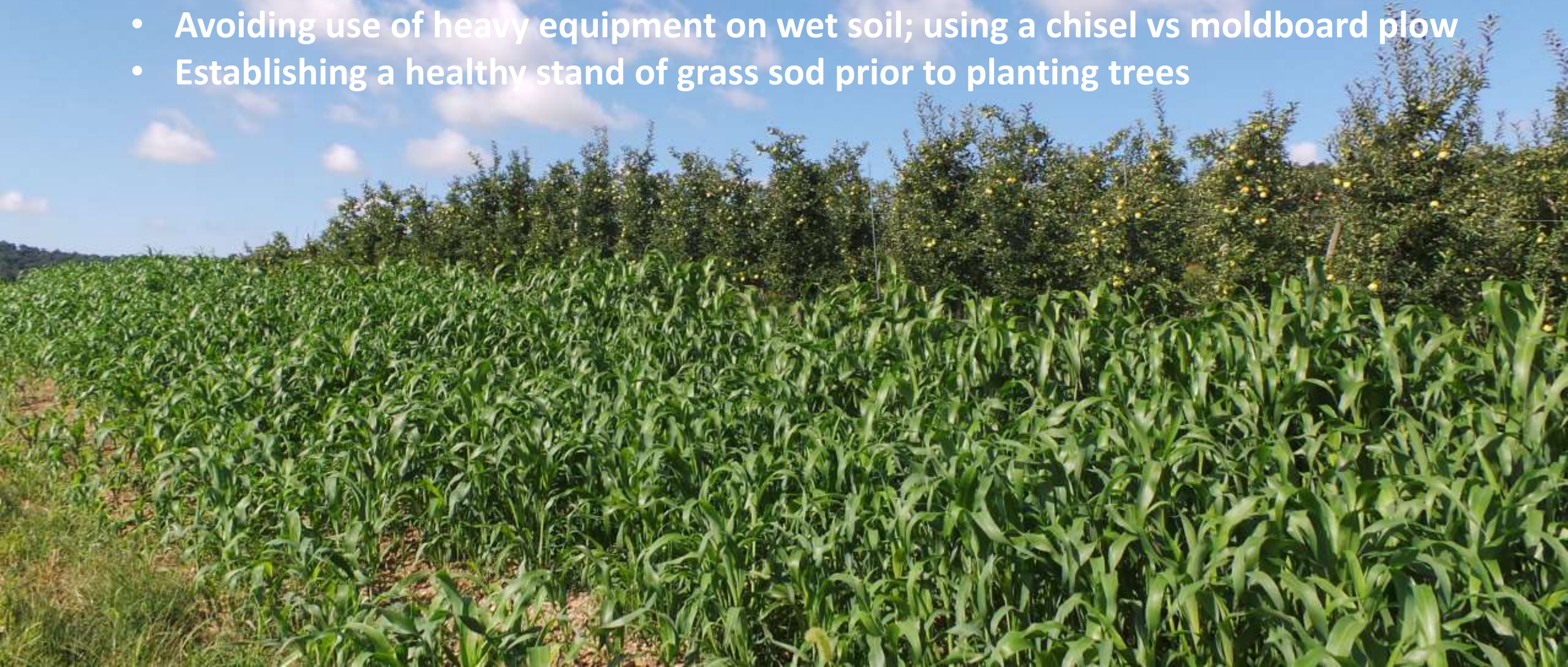
Right: No Rotation

Goldrush in adjacent block where trees were planted the spring following the removal of the prior orchard

Average of 7 apples/tree in 2nd leaf

Soil Health Considerations when Preparing Land for Planting

- Soil testing, incorporation of lime and fertilizer
- Rotation crops and cover crops
- Avoiding use of heavy equipment on wet soil; using a chisel vs moldboard plow
- Establishing a healthy stand of grass sod prior to planting trees



Climate Change Considerations/Practices

- **Water conservation**
- **Water monitoring and management**





Is Environmental Sustainability Worth the Investment?

- Yes – would choose biofumigation over chemical even if yield slightly lower
- Yes – cover and rotation crops to prevent erosion and maintain soil health