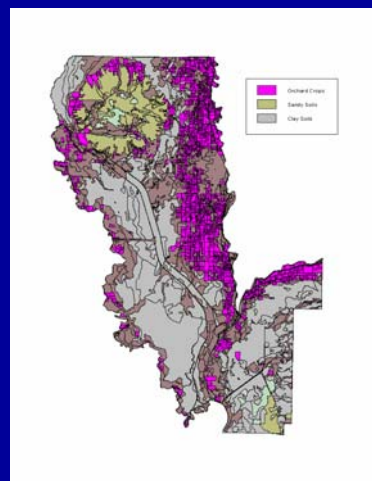
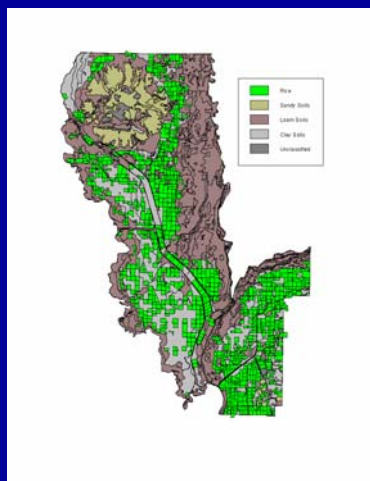


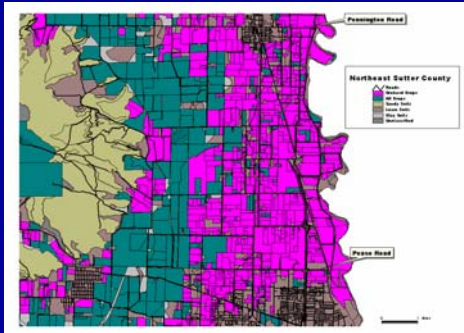
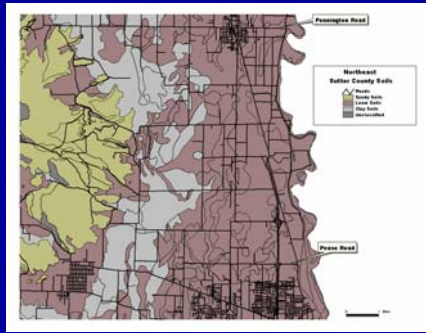
GROWING WALNUTS AND PEACHES LOCALLY– TECHNICAL FEASIBILITY, ISSUES, and POTENTIAL TECHNOLOGIES

JANINE HASEY
UC FARM ADVISOR
SUTTER & YUBA COUNTIES
May 6, 2004

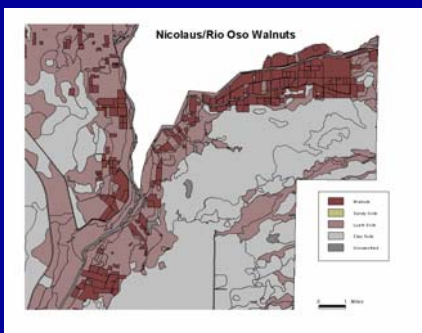
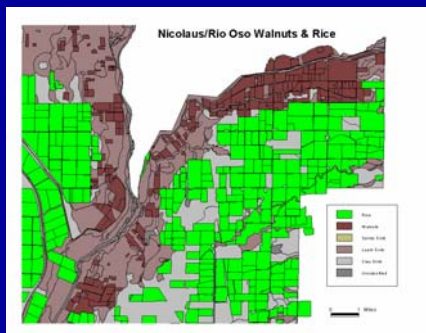
Sutter Crops by Soil Type



NORTHEAST FEATHER RIVER CORRIDOR



Nicolaus/Rio Oso Crops by Soil Type



SOIL REQUIREMENTS & LIMITATIONS

- Walnuts best on deep, well-drained, non-stratified loamy soils
 - More careful management needed as planted on shallower more marginal soils
 - Problems with seepage especially along the Sacramento River
- Peaches Need 3 feet of well-drained, loamy soil
- Peaches have more even ripening on loam soils
 - Advantage over the S. Joaquin Valley's sandy soils
- Both do better on berms except for sandy soils

CLIMATE

- Insufficient chilling for walnuts & peaches in some years.
- Occasional spring frost problem
- Microclimate differences
 - Nicolaus/Rio Oso area cooler than Yuba City area. D-10 in between (cold air drainage from the Sierra). Affects harvest timing.
 - Cooler areas & nights favor higher walnut quality

CLIMATE AS IT INFLUENCES DISEASE

- Wet years – more Phytophthora crown rot
- Higher rainfall in the north
 - Walnuts - more blight – higher spray costs
 - Use of Xanthocast forecasting model
 - Testing new chemicals ongoing
 - Peaches
 - More brown rot sprays than in south
 - Must protect for leaf curl & shothole
 - More rust
 - Use model to predict if & when a spray is needed

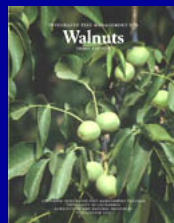
WATER CONSTRAINTS

- Availability in drought years & increased costs
 - Continued trend toward low volume irrigation systems (applying only what is lost through evapotranspiration) to save water & costs
- Water quality for tree crops is typically good
- Of more concern...
 - Watershed water quality & impending regs

PRESENT & IMPENDING ENVIRONMENTAL REGULATIONS

- No pesticide runoff into our watersheds
 - Ag waivers
- The loss of more conventional pesticides
 - Increased need for applying best management practices & using reduced risk pesticides and alternative controls
 - We have for peaches & walnuts. Continue to work on making them more economic for the grower
 - Cost share programs through NRCS EQIP programs
- Air quality – prohibition of ag burning in SJ Valley – nonattainment for PM10, not north Sac Valley - no foreseeable restrictions.
 - To reduce burning, need for adequate chipper to dispose of walnut brush

WALNUTS – WHERE WE FIT IN 2003 PRODUCTION – 324,077 t



- San Joaquin Valley – 172,236 tons (53%)
- Sacramento Valley – 136,266 tons (42%)
- Butte - 3rd 37,937 t
- Sutter - 5th 28,520 t
- Tehama - 6th 22,786 t
- Glenn – 7th 14,432 t
- Sutter + Yuba 41,700 t

INCREASING EFFICIENCY, SAVING \$

- Highest labor cost - pruning
 - \$154/acre alternate years
- Conventional
 - Longer intervals
 - Mechanically hedge
- Hedgerow plantings
 - Trend there, will increase
 - \$25-50/per cut acre
- Closer spacing, early, higher production



2003 VARIETY DISTRIBUTION

- 20% of Walnut Crop is Hartley
- 10% Serr
- 9% Vina
- 36% Chandler
 - “Maxed out” of huller capacity for more late harvested walnuts
- 2% Howard
 - More being planted with earlier harvest

INCREASING HULLING & DRYING CAPACITY

- Improved hulling capacity
 - Electronic color sorter on the huller, replaces manual labor
 - Sorts green not completely hulled & diverts so can be handled separately
 - Sorts black adhering hull (sunburn, etc.)
- Extra drying capacity
 - Modified hopper-bottomed grain trailer
 - 1/3 price
 - Dries 12-13 tons

GENETIC IMPROVEMENT WHAT TO WATCH FOR



Classical Breeding

1. Three new cultivars will be patented, grown in nurseries in 2004, probably ready for growers in 2006. Early harvest, early leafing but low blight, high yields, light kernel color.

New Varieties

Sexton (90-31-10)

Gillet (95-22-26)

Forde (95-26-37)

Early harvest. Early leafing but low blight. High yields. Light color. Also meet other standards.

CLASSICAL BREEDING

2. Walnut blackline disease tolerant rootstocks. Selected for vigor – Paradox attributes but respond to blackline like English. **Grower trials – 2004-05.**
3. Walnut blackline disease resistant variety with good nut quality. **Maybe 2010.**

BIOTECHNOLOGY

1. Have transgenic walnut trees with the Bt (*Bacillus thuringiensis*) gene. Potentially resistant to lepidopterans like codling moth. Have had for 14 years. Available if GMO's are accepted.
2. Crown gall resistant Paradox rootstock. Exists now for disease resistance. The question is how well it will propagate. Near future.

(Gale McGranahan, Walnut Improvement Program, UC Davis)

PEACHES – WHERE WE FIT IN



- Sacramento Valley
52% of CA Production
(16,765 bearing acres)
- Lower tonnage/acre
- Most canneries down south
- Contracts expiring, hard to get new ones
- 53,000 unsold tons 2004

MUST DECREASE PRODUCTION COSTS

- Assume peach price not increasing
- Must compete with countries with cheap labor or subsidies
- Must reduce labor & increase mechanization
 - Mechanical pruning or pre-pruning
 - Mechanical or chemical thinning, pre-thinning
 - Mechanical harvest (\$18/ton vs. \$55/ton for hand picked)

THINKING OUTSIDE THE BIN

- Develop A Peach Growing System Ideal For Mechanized Pruning, Thinning And Harvesting
- Nuts & tomatoes did it, SJV wine grapes almost totally mechanized, raisin grapes making transition (M. Norton)

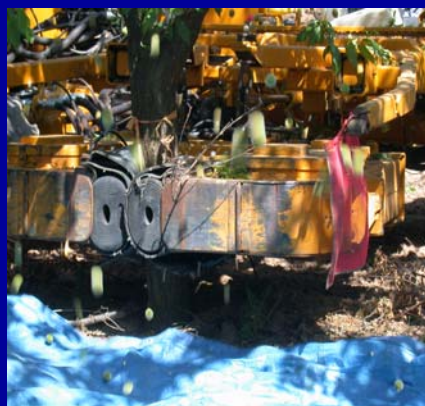


MECHANICAL THINNING

- Hand thinning cost \$251/acre
- Mechanical thinning – today's technology
 - Roughly \$50/acre using a sidemount shaker
 - Sutter & Yuba Counties
- Research also underway on an electromagnetic limb shaker



MECHANICAL THINNING



Sidemount Shaker

CHEMICAL THINNING

- Surfactant Entry
 - (Photos After Entry Spray)
 - Continue to fine tune
- Working with other materials
 - Inexpensive like lime sulfur & fish oil



MECHANICAL HARVEST

- UC & cannery studies – can deliver quality fruit with proper management & engineering of harvesting equipment
- Depends on temperature, fruit firmness, time delay from harvest to canning, cannery capacity, delivering a given amount
 - Our logistical problem is the distance from canneries
 - Y-S Economic Development Corp. working with growers to get funding for feasibility study on bringing a new facility here
 - Cannery issue – need to work in that direction
- Smaller trees, train & prune to avoid heavy hangers that become scaffold branches that cause fruit to bruise as they hit them during shaking

MECHANICAL HARVEST



GENETIC IMPROVEMENT

- Release of 11 clingstone peach selections ranging from Ultra-Earlies to Extra-Lates in 2004 for large grower test plantings. Goodwin - possible replacement for Andross.
(Tom Gradziel, Pomologist, UC Davis)
- Release of two new size controlling rootstock selections in 2004 from UCD & USDA
 - Goal is to breed a series of size controlling rootstocks to reduce labor costs

GENETIC/BIOTECH WHAT TO LOOK FOR IN CLING PEACH

1. Release of varieties adapted to machine harvest/long distance transport (6-10 years)
2. Possible discovery of Laetrile-like phytonutrients
3. Possible spread of plum pox virus (Sharka) into CA (all cultivars moderately susceptible)

GENETIC/BIOTECH WHAT TO LOOK FOR IN CLING PEACH

4. Possible vulnerability of current cultivars to climate change (low chilling, late frosts, new diseases).
5. Shift of cultivar planting patterns brought about by shift to pricing based on fruit quality/case yields.
6. Possible development/identification of a good size controlling rootstock to control tree structure, bearing habit, leafing, etc.
 - More suited to mechanization

ALTERNATIVE CROPS

- **WHAT CAN I PLANT THAT WILL MAKE MONEY?**
- **MANY CROPS WILL GROW HERE**
 - Persimmons, freestone peaches, nectarines, cherries, apricots, chestnuts
 - Can't compete with SJ Valley for commercial market
- **Their place - "niche market" – roadside, direct, farmer's market, organic, value added**
 - For a few growers – not going to economically support massive acreage conversions

WHAT ABOUT PISTACHIOS?



- Grown in south SJ Valley & Iran
- Light, sandy loams
- Production -8th leaf
 - Expect longer here
- Alternate bearing
- Rain –get poor set, Botryosphaeria
- Hulling – ship south

AND PECANS?

- Grown in Tulare County & several states
- Alternate bearing
- Can handle deep soil subject to flooding
- Subject to limb breakage & aphid
- Mechanically hedge and shaker thin
- Takes time to establish trees
- Need to increase per acre production up north
- Huller in Tehama County now

WHAT ABOUT GRAPES?

- Mainly wine grapes grown in Yuba County foothills and Colusa County
- Most acreage associated with a winery
- Limitations from hot summer nights on quality for many varieties
- Don't plant without a contract
- Growing grapes very different than growing a tree crop

RED WALNUTS - LIVERMORE



- Niche markets, direct marketing
- Halves
- Isolate trees so red walnuts do not get mixed in with other varieties
- More red selections under evaluation

THANK YOU

University
Of California
Cooperative Extension

UCCE

