Pre-Plant Preparation and Walnut Planting Considerations

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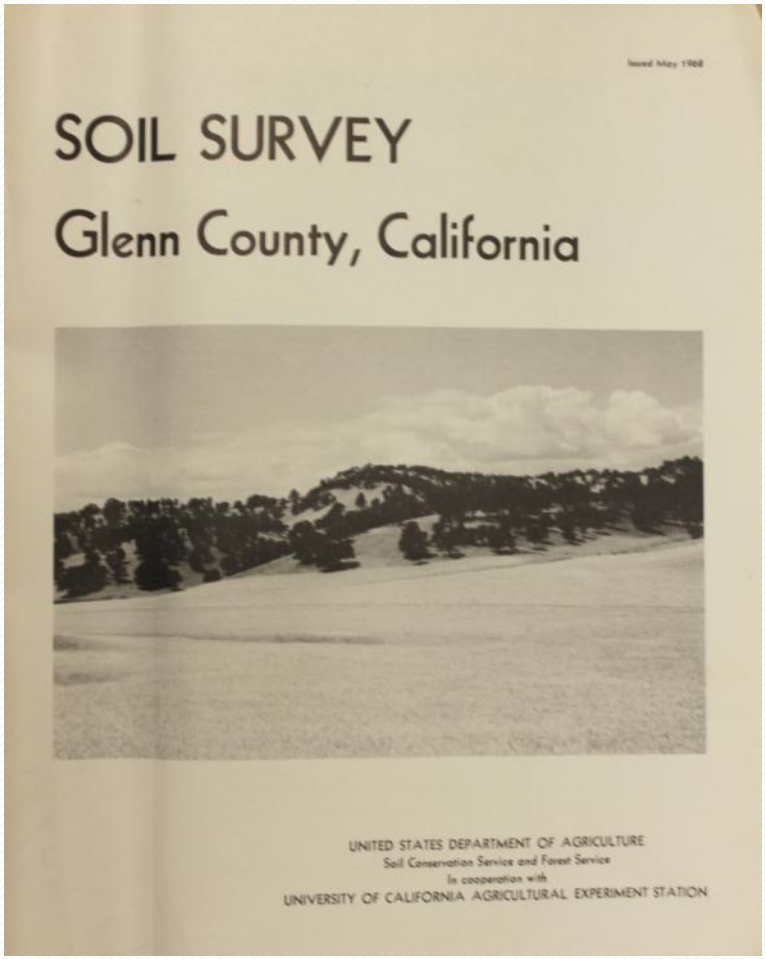
Start with Soil Evaluation

- Traditionally walnuts are grown on the best soils
- With the right preparation they can be grown on less than ideal soils

Tools

- Soil surveys
  - Soil type and distribution
  - Drainage
  - Flooding potential
  - Exchangeable sodium



NRCS Soil Web Survey
http://websoilsurvey.nrcs.usda.gov

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Map Unit Legend

Glenn County, California (CA021)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AoA	Arbuckle gravelly loam, 0 to 2 percent slopes	17.1	46.2%
AoB	Arbuckle gravelly loam, 2 to 8 percent slopes	0.8	2.2%
Kb	Kimball loam, 0 to 2 percent slopes	16.4	44.5%
KmB	Kimball gravelly loam, 2 to 10 percent slopes	2.6	7.0%
Totals for Area of Interest		**36.9**	**100.0%**

Legend

Soil Map

Scale (not to scale)

Check with Backhoe

- Start with soil survey
- Dig holes where ever the map or your experience tells you there may be differences

Soil Modification

- Reasons
  - Disrupt and mix restrictive layers- compacted zones, hardpans, clay pans.
- Timing- Late summer early fall
  - Pre-plant
  - Maximizes disruption
  - Allows for resettling and touch up leveling

Soil Modification

- Deep uniform soils – 1-3 ft. to break up compacted zones
- Stratified clay or hardpans – 3 -6 ft.

Backhoeing

Sandy light Soils
Cost prohibitive
on heavier soils

Slip Plow or Ripper

Hard pan – Ripper
Clay pan – Slip Plow
$300-500/acre

Leveling

- Flood irrigation – level to grade
- Solid set, micro sprinklers, drip – Touch up level to smooth out low spots and provide for surface drainage

1986 Planting Nickels Estate, Arbuckle CA

- **12 X 18 north south**
- **Chandler vs. Howard**
- **Paradox vs. NCB**
- **Single line drip converted to double line in sixth leaf**
- **Monthly N**
- **400 lbs potassium sulfate, from 1991**
- **Slip plow vs. undisturbed**

Soils-

Approximately 30% Arbuckle series- Class II- gravelly loam 3-6 ft over gravel

70% Kimball series- Class III- silt or gravelly loam over clay- 12 to 36 inches

Slip Plow

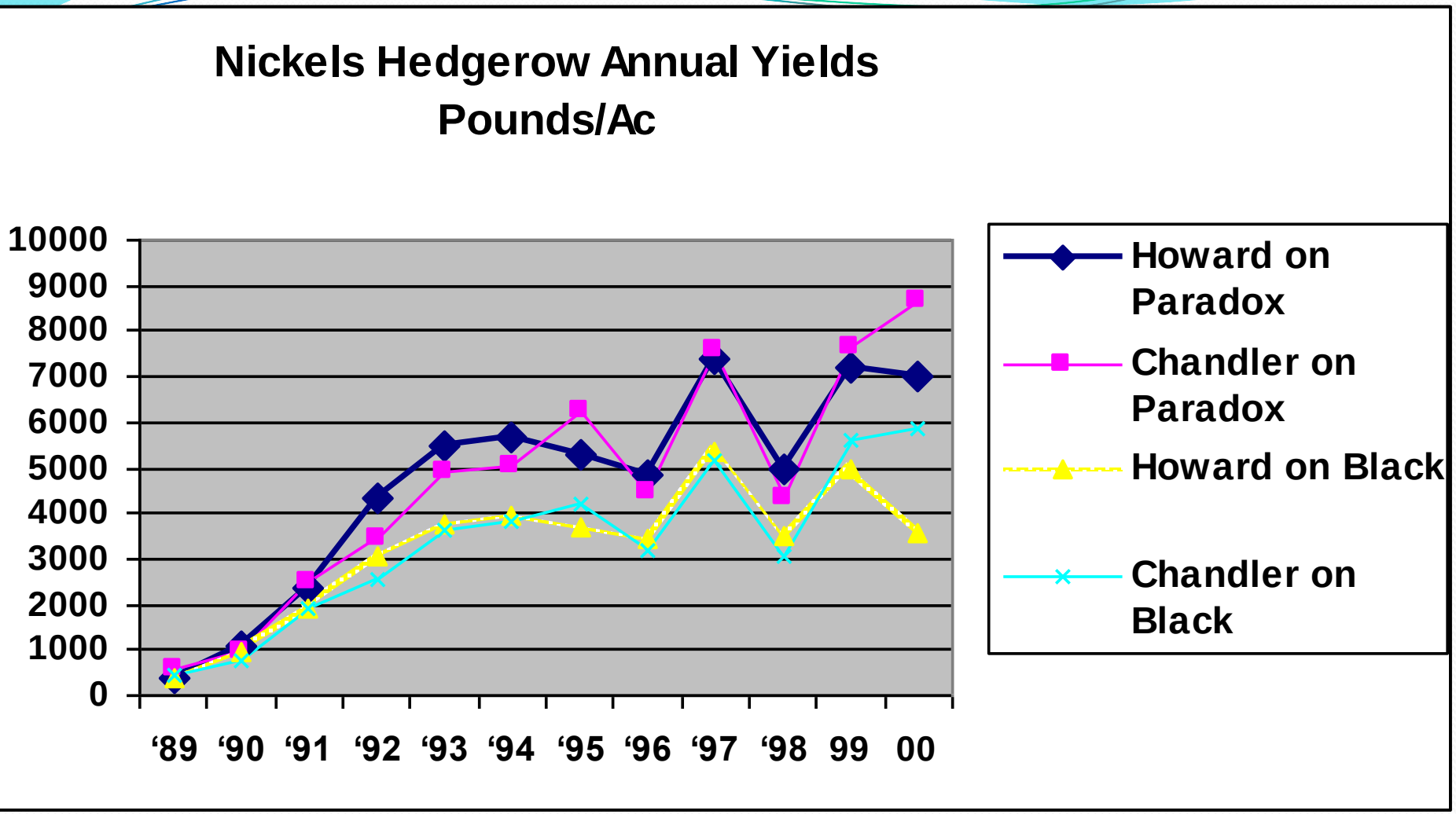
1985

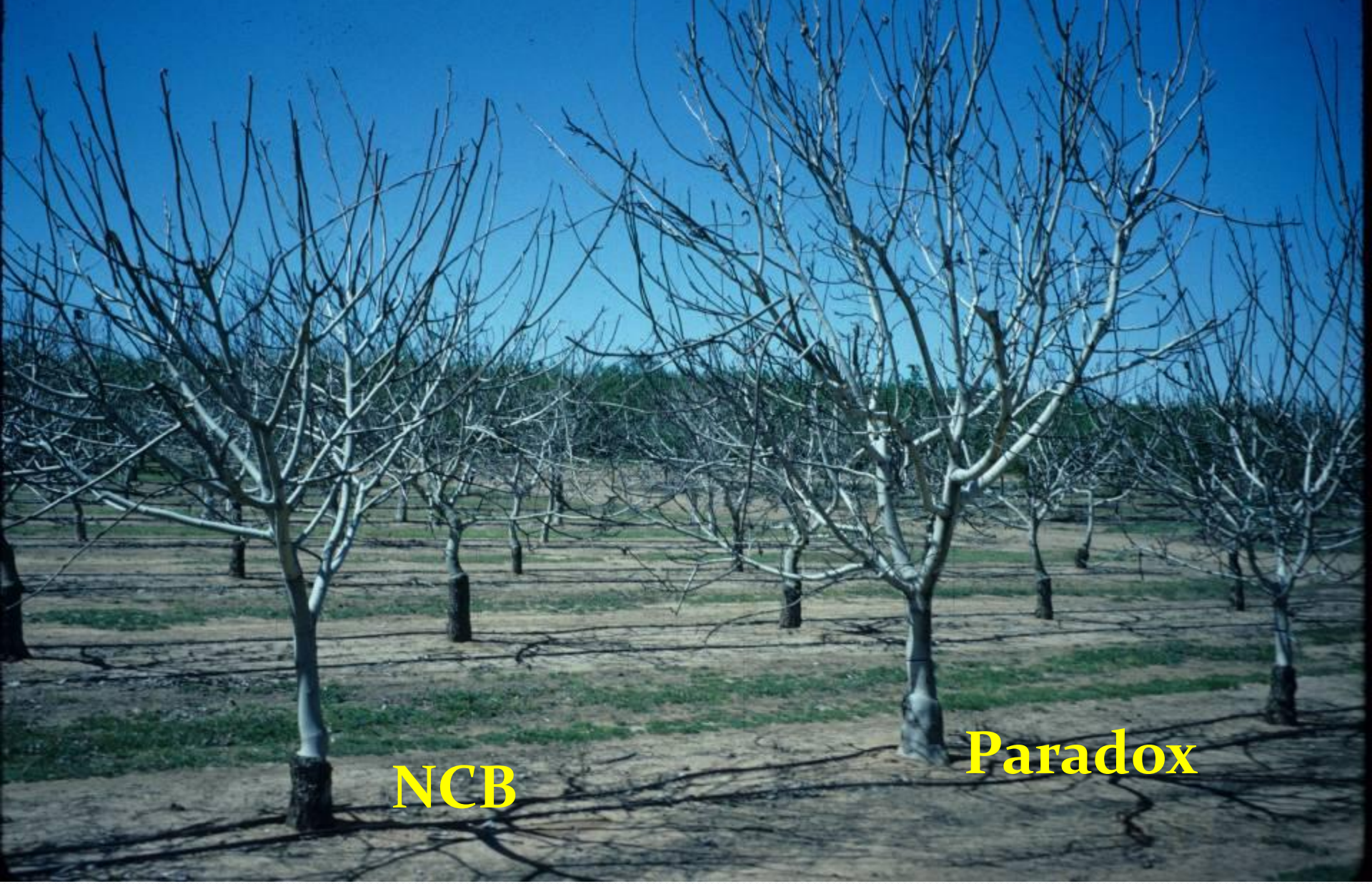
5-6 ft deep

North South

10 ft centers


Slip Plowed
1996
roots
Clay pan


Nickels Hedgerow Annual Yields
Pounds/Ac
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
'89
'90
'91
'92
'93
'94
'95
'96
'97
'98
99
00
Howard on Paradox
Chandler on Paradox
Howard on Black
Chandler on Black


NCB
Paradox

Nickels Hedgerow - 1999

Tree Size & Yield

Treatment	Trunk Circ cm	Yield lbs/Ac	Yield Effic. (yield/circ)
NC Black	49.4 B	5296 B	107
Paradox	55.1 A	7424 A	135
Howard	48.5 B	6093	127
Chandler	56.0 A	6627 ns	118
Non-Slip	53.8	6870	128
Slip	50.6	5849	116


SP on 10 ft centers
N/S & diag, 6ft deep
2 replications

Slip Plow Almond Yields

Lbs/acre

	5th 2001	6th 2002	7th 2003	8th 2004	9th 2005	10th 2006	Accum
Slip Plow	1070	2725	2165	1869	1548	2910	13,181
No Slip Plow	1243	2761	2323	1865	1841	2862	13,725

Conclusions

- Slip plowing permanently disrupts claypan soils and increases the depth of rooting
- May not always lead to larger trees or increased production
- Shallow rooting depth may be compensated for by frequent irrigation and fertilization and closer tree spacing

Planting Guidelines

- Plant into field capacity or drier
- Dig hole with auger or shovel only big enough and deep enough to accommodate the tree

Planting Guidelines

Avoid slicking the side of the hole

Planting Guidelines

- Prune roots to fit hole
- Treat to prevent Crown Gall?
  - Many strains of Crown Gall bacteria and resistance is widespread

Plant on Mound or Berm

on heavier soils

Planting Guidelines

- Plant at same depth as in the nursery (after settling)
- Orient strong root into prevailing wind
- Orient bud crook away from sun
- Work soil around roots
- Water in if necessary
- Pull trees up if they settle

Planting Guidelines

- Head back
  - Nursery grafted – 3-5 buds (15-24 inches)
  - Rootstock – 12 – 14 inches
- White wash 1:1 interior latex and water – sunburn
- Tree wrap - herbicide
- Stake 8 ft on, 8 to 10 inches from tree on upwind side

Replant situations

- Special considerations
  - Walnut replant problem
  - May need extended fallow period or pre-plant fumigation
  - For more information go to: http://www.uckac.edu/nematode

    Mike McKenry