

Pre-Plant Preparation and Walnut Planting Considerations

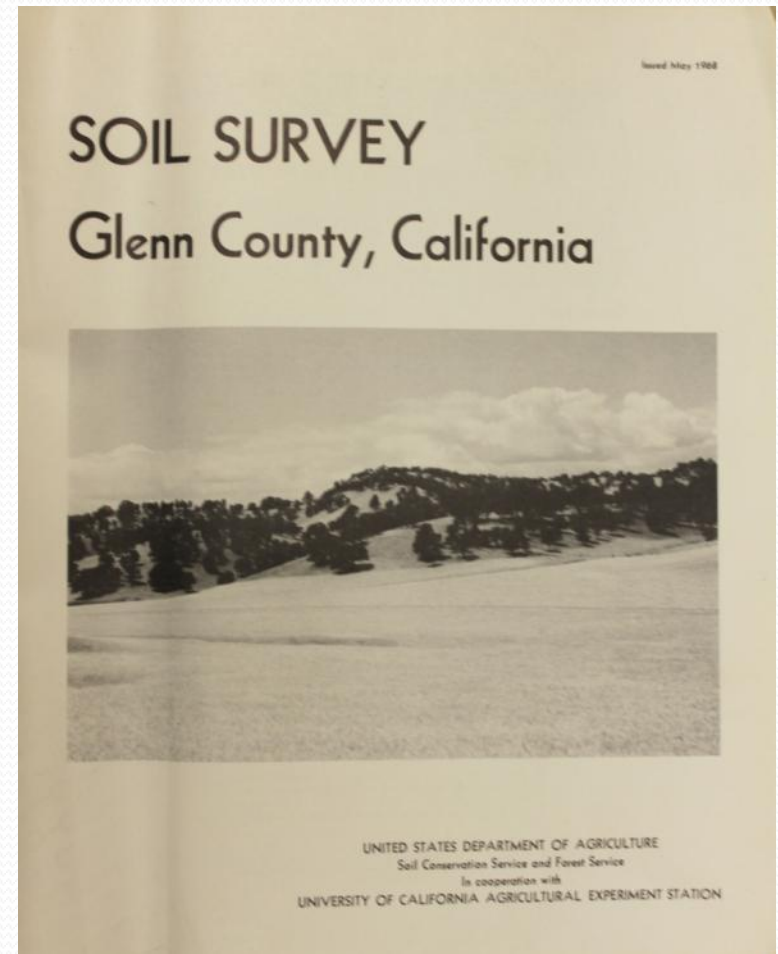
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Start with Soil Evaluation

- 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>

Web Soil Survey - Home - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>



USDA United States Department of Agriculture
Natural Resources Conservation Service

Web Soil Survey

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- Archived Soil Surveys
- Status Maps
- Official Soil Series Descriptions (OSD)
- Soil Series Extent Mapping Tool
- Soil Data Mart
- Geospatial Data Gateway
- eFOTG
- National Soil Characterization Data
- Soil Geochemistry Spatial Database
- Soil Quality
- Soil Geography
- Geospatial One Stop

The simple yet powerful way to access and use soil data.



Welcome to Web Soil Survey (WSS)



Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

Three Basic Steps

- 1 Define.**
Area of Interest (AOI) Use the **Area of Interest** tab to define your area of interest.

Click to view larger image.

- 2 View/Explore.**
Soil Map Click the **Soil Map** tab, or click the **Soil Data Explorer** tab to access soil data for your area and determine the suitability of the soils for a particular use. The items you want saved in a report can be added to your shopping cart.


I Want To...

- Start Web Soil Survey (WSS)
- Know the requirements for running Web Soil Survey
- Know whether Web Soil Survey works in my web browser
- Know the Web Soil Survey hours of operation
- Find what areas of the U.S. have soil data

Announcements/Events

- Web Soil Survey Release History

I Want Help With...

- How to use Web Soil Survey
- How to use Web Soil Survey Online Help
- Known Problems and Workarounds
- Frequently Asked Questions
- Citing Web Soil Survey as a source of soils data



Tips & Shortcuts
WSS

Internet

start Web Soil Survey - Ho... 11:

Area of Interest (AOI)

Soil Map

Soil Data Explorer

Shopping Cart (Free)

Printable Version

Add to Shopping Cart



Search

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%

Soil Map

Legend 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



1985

5-6 ft deep

North South

10 ft centers

Slip Plow





Slip Plowed

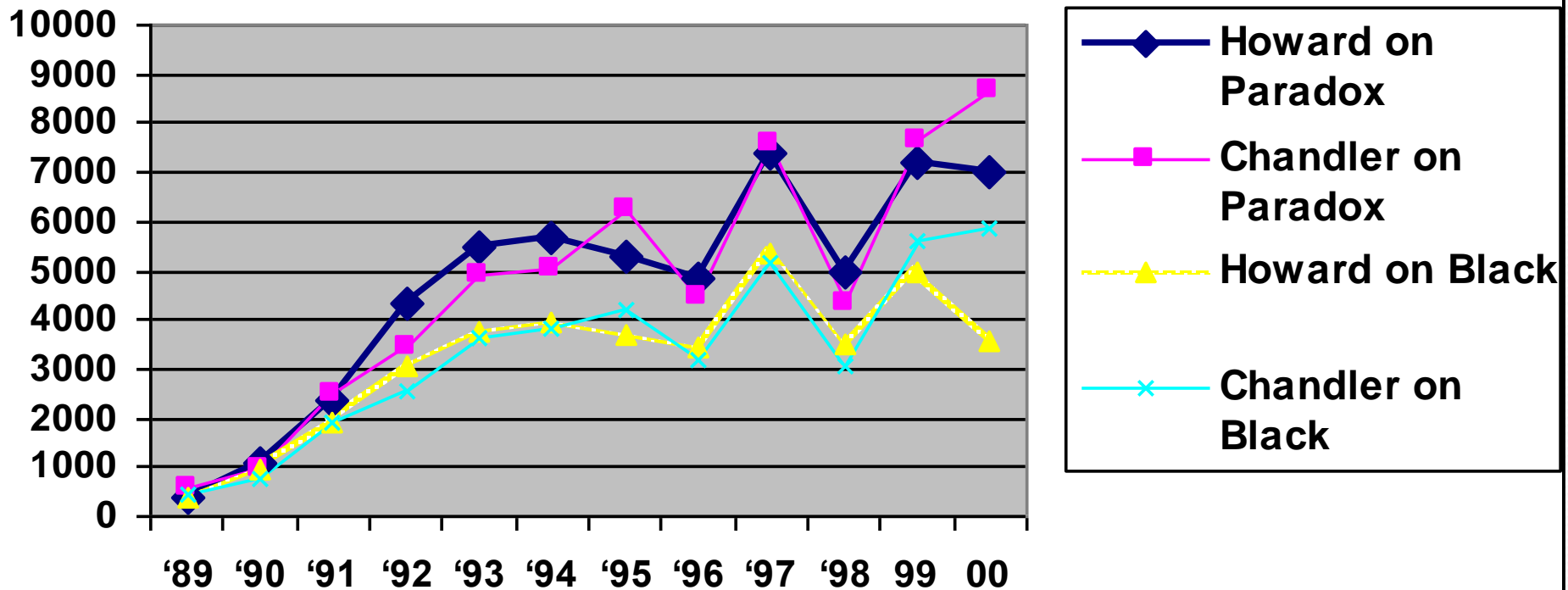
1996

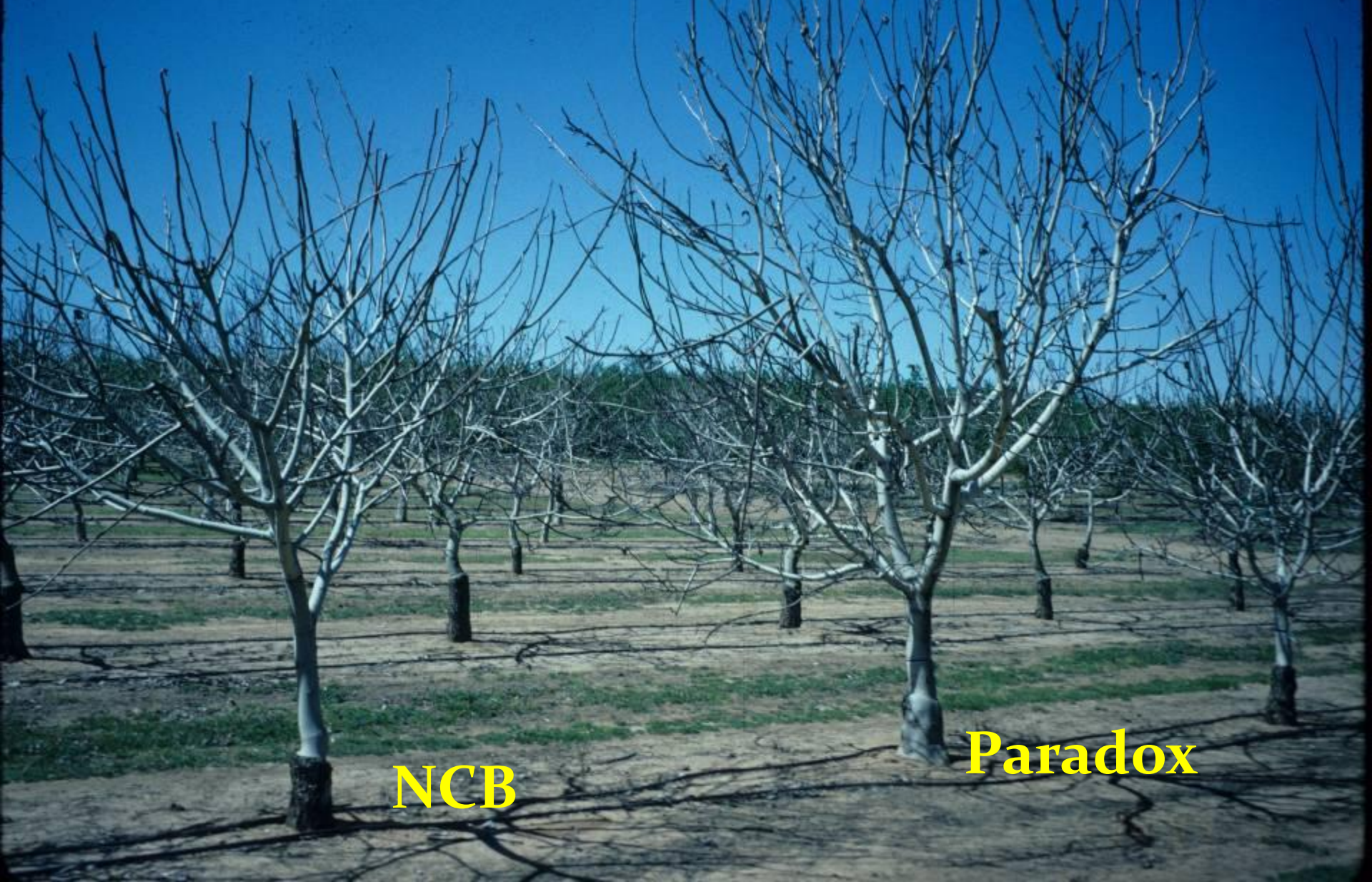
roots

Clay pan



Nickels Hedgerow Annual Yields Pounds/Ac





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

	<u>5th</u> <u>2001</u>	<u>6th</u> <u>2002</u>	<u>7th</u> <u>2003</u>	<u>8th</u> <u>2004</u>	<u>9th</u> <u>2005</u>	<u>10th</u> <u>2006</u>	<u>Accum</u>
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