



GUIDELINES TO EVALUATE APPLES FOR COMMERCIAL PLANTING IN THE SIERRA NEVADA FOOTHILLS

Maximum elevation: 4,000 feet level terrain

Optimum elevation: 2,500 - 3,000 feet

Soil texture: Sandy loam, loam, silt loam, clay loam

Soil families: Excellent performance on Josephine. Other good soils are Musick, Aiken, Holland, Shaver, Sierra, Sites, Cohasset, Auberry

Acceptable drainage: Fair to good

Acceptable soil depth:

Minimum - 2 feet

Optimum - 4 feet (for fruit quality)

Slope: Neutral, south, southwest, west, east, slightly north

Row orientation: North to South is best for close in row tree spacing. Frost potential and steepness of slope would be overriding factors.

Water required: Inches per season (orchard with ground cover)

1000-1500=49 inches

1500-2000=44 inches

2000-2500=39 inches

2500-3000=36 inches

3000-3500=33 inches

3500-4000=31 inches

Add 10-15% for south, southwest slopes. Subtract 10-15% for north, north east slopes. Add 25-30% for extra heavy cover crop. Add 20-30% to all irrigations to account for system losses and inefficiencies.

Note: Most foothill soils store 1.5 to @ inches of water per foot from winter rainfall. This water and any rainfall during summer can be subtracted when calculating irrigation needs.

Temperature constraints: 28°F during bloom, bloom date important e.g. Granny Smith, empire and Gravenstein bloom early; Romes 4-5 weeks later. Red apples don't develop red color at lower, hotter elevations and sunburn increases. Late maturing varieties such as Granny Smith and Fuji may not have adequate number growing days to mature above 3000 feet elevation. Ridge tops provide better overall temperatures than valley in the foothills.

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Age:

To bearing 4 to 6 years
Maximum bearing 8 to 10 years
Prime bearing years-9 to 40 years

Varieties(in order of maturity): Gravenstein, Paula red, Akane, Golden Delicious, Red Delicious ,Empire, Jonagold, Stayman, Red Rome, Granny Smith, Fuji.

Rootstocks:

EMLA 106-1/2-2/3 size tree.
EMLA 111-2/3-3/4 size tree
EMLA 7A-1/2 size tree
Seedling-standard tree size

Number of trees per acre. 200 to 400 Spacing from 15 feet square to 7 X 15'

Irrigation methods:

Micro sprinklers
Under tree permanent set sprinklers
Portable sprinklers
Drip on nearly level ground (erosion can be a problem on steep slopes)
Over tree permanent set sprinklers when frost protection is desired.

Yields:

Fair - 10 tons per acre
Good - 15 to 20 tons per acre
Excellent - 25 tons per acre

Major diseases: Apple scab, powdery mildew, oak root fungus, phytophthora crown rot.

Persistent insect pests: Codling moth, San Jose scale, Rosy apple aphid.

Other common pests problems: Deer, meadow mice, gophers, birds.

Culture:

Training - Red varieties-central leader or two leader
Green/Yellow varieties-three or two leader
Weeds - 1 Cultivation-followed by mowing.
2.Perennial grass cover crop(dwarf strains of rye, fescue, orchard grass).
3. Strip spray weeds in row and mow centers.
Pruning - annual removal of excess current season growth and renew spurs on 5 year rotation.
Irrigation - 8 to 12 sprinkler applications or at 60 c.b. on tensiometer (18 inch depth) for sprinkler and 30 c.b. for drip
Spraying - 5 to 9 applications

Establishment Costs:	\$ Per Acre
Fencing	200 - 400
Trees	800 - 1600
Irrigation System	400 - 1200
Materials	500 - 800
Labor	1000 - 1300
Miscellaneous	100 - 700

	TOTAL \$3000-6000

Equipment Costs:	\$ Per Farm
Part time farm (minimum)	1000
Full time farm	New 60,000 - 100,000
	Used 15,000 - 20,000

Production Costs:	\$ Per Acre
Cultural	600 - 900
Harvest	500 - 700
Overhead	?

	TOTAL \$100-1600

Annual Gross Income:	\$ Per Acre
	1000-4000

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