THE ROOTS OF AN ORCHARD

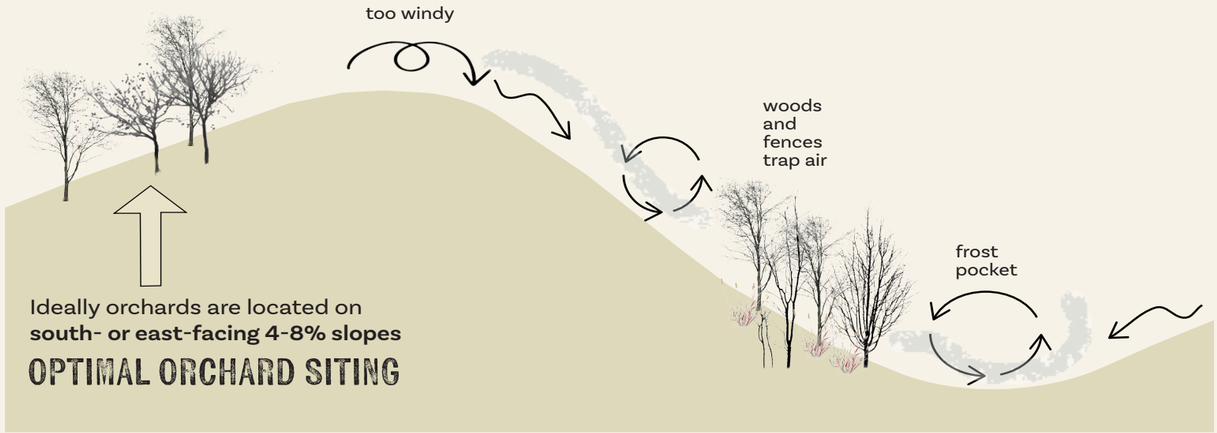
LA HUERTA EN LA VEGA / TSOSIE-PEÑA PROJECT

Lauren Thomson | iD Studio LA503_2023

PLANNING A PERMACULTURE ORCHARD

A permaculture fruit orchard design contains a variety of fruit trees and other plants that will look and act like natural ecosystems. This type of planting is sometimes called a "fruit tree guild."

SITING



Depressions in the landscape, or barriers to air movement, including windbreaks, are locations for potential frost pockets. Narrow valleys can also be cooler than surrounding land and often windy. For wind proctection, consider planting shelterbelts with attention to cold air movement.

SOIL & MULCH

It is essential to do the preparatory work first to get the soil right before adding trees. This includes soil testing, soil amendment, and soil preparation.

CHOP & DROP/ SHEET COMPOSTING

- Supports soil life
- Leaves the roots of the plants in the soil, which adds organic material deep in the soil as the roots decompose
- Reduces water loss from evaporation
- Slowly releases nutrients back into your soil
- Saves time and energy by eliminating the need to compost or haul the plant material away

DISEASE/PEST MANAGEMENT

The Trios design* involves the intentional interspersing of Nitrogen fixers with apples and plums/pears or other crop trees so that no fruit tree is next to its own species. If a tree gets infested with a pest, the Trios design reduces the likelihood that the pest will infest another tree of its kind, with individual trees acting as "islands" to isolate the deleterious insects therefore reducing/eliminating the use of fertilizations and pest/ disease control products.

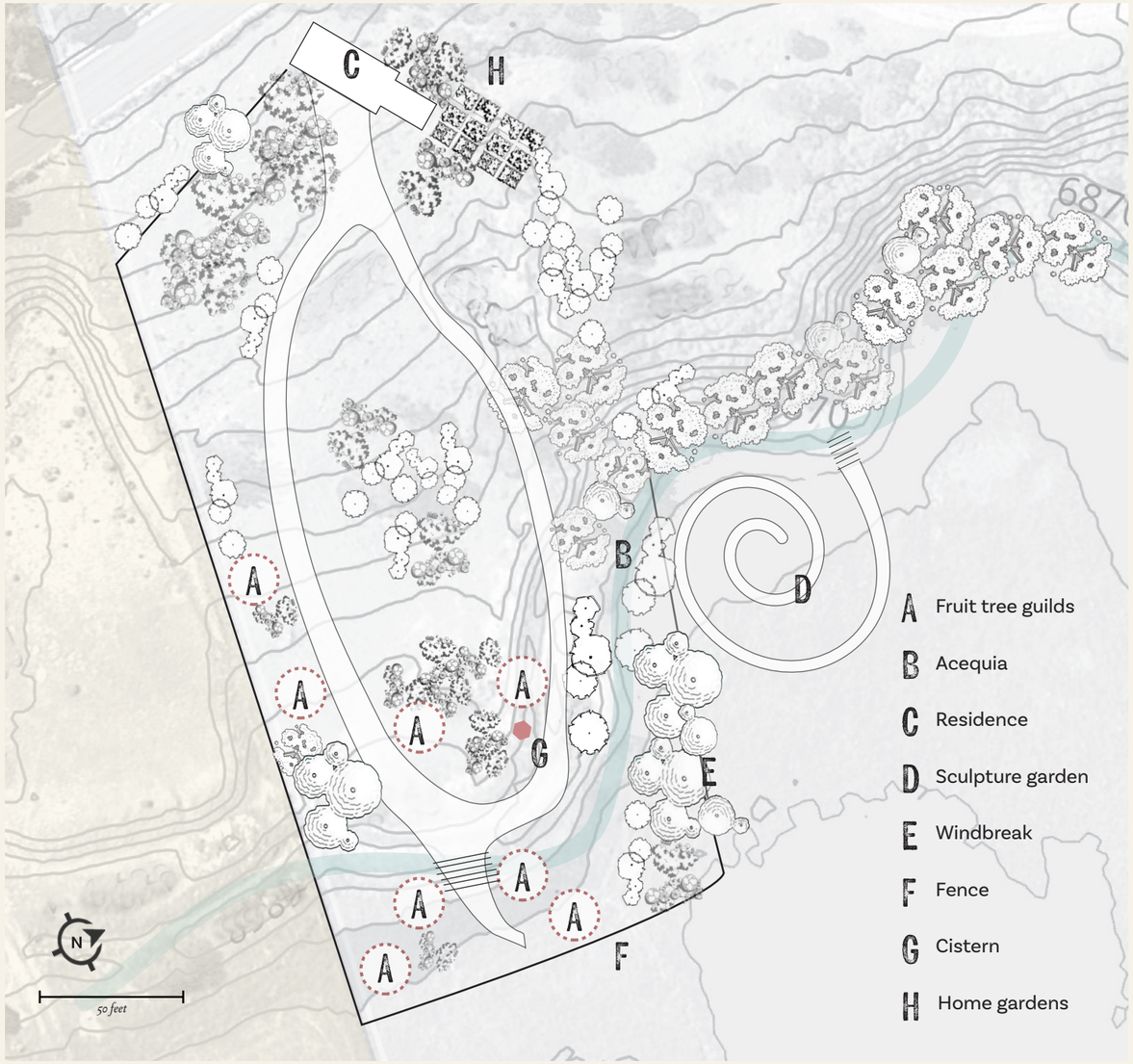
**Stefan Sobkowiak*

GOOD NITROGEN FIXERS FOR NORTHERN NEW MEXICO

Trees: Black locust, alder, acacia trees, New Mexico Locust (*Robinia neomexicana)*
Shrubs: *Amorpha fruticosa*
Vegetables and cover crops like clover, alfalfa, fenugreek, peanuts, snap peas, lupine, beans

"The best management of a forest is its non-management."
Akira Miyawaki

SITE MAP



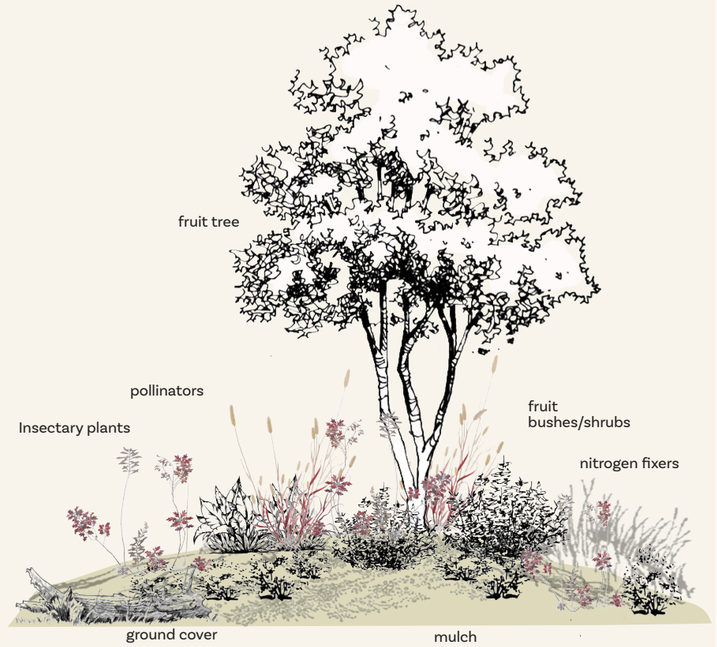
Fruit Tree Type	Bloom Time	Fruiting Season	Size at Maturity	USDA Zones
Apple	Mid-April - mid-May	Early summer to mid-fall	8-25 ft H, 8-20 ft W	4 – 10
Plum	Mid-March - mid-April	June to August	10-25 ft H, 10-20 ft W	4 – 9
Pear	April	Summer to fall	8-20 ft H, 7-12 ft W	4 – 8 *(Common Pears)*; 5 – 9 *(Asian Pears)*
Apricot	April	Early - late summer	5-30 ft H, 5-25 ft W	4 – 8
Peach	March - April	Early - late summer	6-25 ft H, 6-25 ft W	4 – 10
Cherry	Mid-March - late April	Late May - July	1 0-25 ft H, 10-25 ft W	5 – 9
Pomegranate	Late May - early June	August - October	3-20 ft H, 3-20 ft W	7 – 11
Persimmon	Mid-April to late June	September - winter	25-40 ft H, 15-25 ft W	4 – 9 (American) or 7 – 11 (Asian)

THE PERMACULTURE FOOD FOREST

Given time, a successful orchard as ecosystem will end up like a forest -- an "endpoint" of ecological succession, a stable and self-perpetuating natural community. Without any significant disturbances, the forest may endure indefinitely, producing food and habitat, and increasing biodiversity.

THE FRUIT GUILD

A plant guild is a combination planting -- a polyculture -- that imitates the qualities of an ecosystem, producing food, building soil health, and providing habitat for pollinators.



THE SEVEN LAYERS

Edible permaculture forests should have seven or more layers: oals,

- OVERSTORY/CANOPY : full-sized nut, fruit, or nitrogen-fixing trees like walnuts and chestnuts
- UNDERSTORY: semi-dwarf fruit trees like apples, pears, redbud, and others (can include crops that don't normally grow in an orchard)
- SHRUB: blueberries, raspberries, currants, roses, willow
- HERB: non-woody vegetation, like parsley, thyme, dill, mint, chives, or tarragon, and vegetable plants like tomatoes, pepper, collards, or okra
  GROUNDCOVER: clover, nasturtium, and strawberries
- VINE: can include things like grapes, honeysuckle, roses, clematis, and others
- ROOT: potatoes, jerusalem artichokes, turmeric, carrots, garlic, onions, radish
- MYCELIUM: underground network of fungal filaments, oyster or shiitake mushrooms grown on logs

FUNCTIONAL NICHES

NITROGEN FIXERS

Nitrogen (N) fixers convert N from the air into a usable form in the soil

Examples: legumes (beans and peas), clover, lupine, comfrey, alfalfa, fenugreek, peanuts, snap peas

POLLINATOR PLANTS

Flowering plants that provide nectar and pollen and act as hosts

Examples: Asclepias, Salvia, Echinacea, Penstemon, Aster, Chilopsis, Cleome serrulata, Chamisa

DEEP ROOTED PLANTS / DYNAMIC ACCUMULATORS

Pull nutrients from deeper within the soil through roots, acting as a fertilizer for other plants that may be deficient

Examples: yarrow, amaranth, borage, dandelion, chicory, apple, maple

REPELLERS

May repel harmful insects

Examples: dill, fennel, coriander, nasturtium

MULCHERS

Provide a regular suply of compost layer to the soil

Examples: artichoke, rhubarb, confrey

SUPPRESSORS

Bulbs that suppress the growth of grasses whose roots might compete for nutrients

Examples: daffodil, leeks, garlic, chives, onions

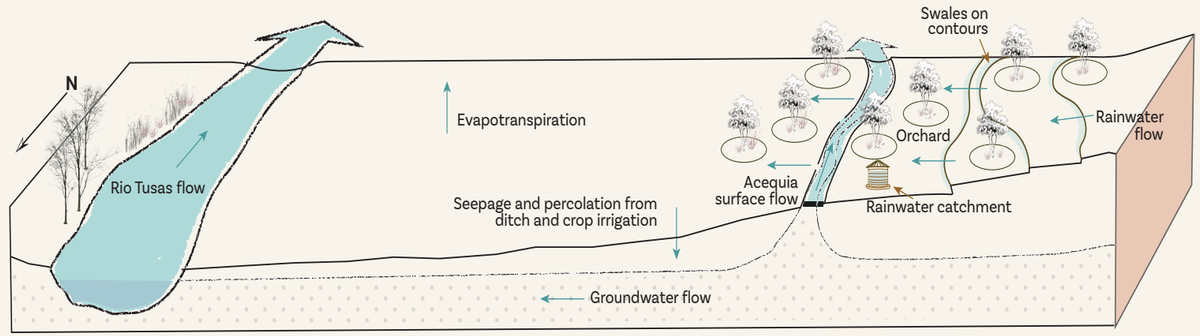
FUNGI

The underground fungal network transports nutrients and moisture from one area of the forest to another

Examples: morel, winecap

IRRIGATION

Since water through the acequia on the property runs only from April to June, it will be necessary to provide supplemental irrigation, particularly when getting the young transplants started.

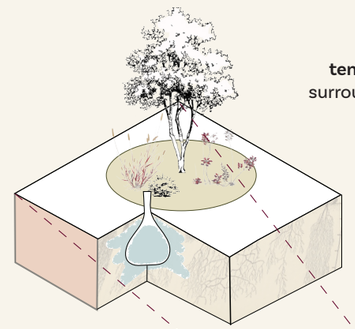


Hydrologic Flow Path

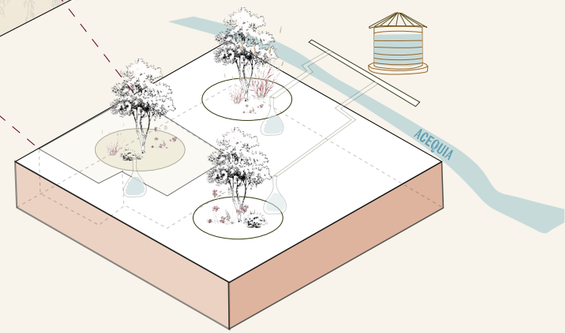
Source: NMSU Water Resource Research Institute

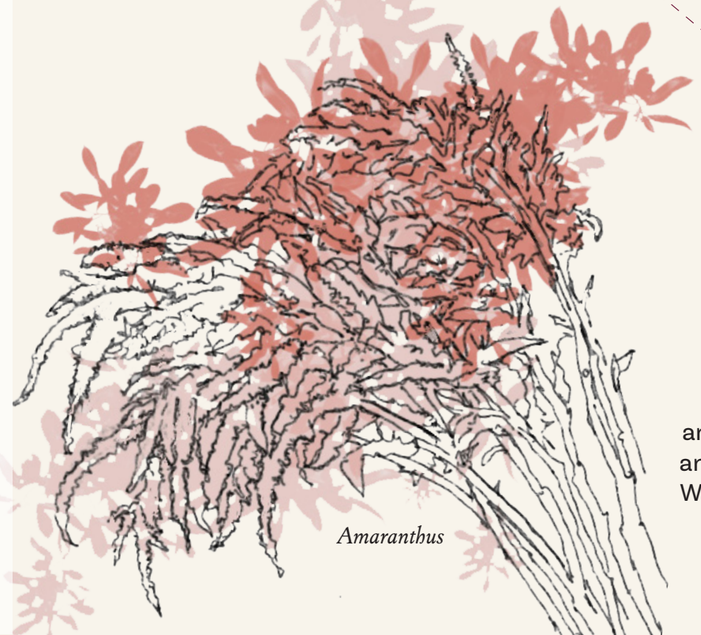
RECOMMENDED TECHNIQUES

- Gray wastewater system from the homesite
- Dedicated rainwater catchment with cistern
- Ollas irrigation system
- Swales on contours
- Minimize evaporation with mulch
- Flood irrigation from acequia
- Planting arid-adopted species



Ollas irrigation uses the principle of **soil moisture tension;** water seeps into the surrounding soil until saturated.





Amaranthus

DRYLAND FARMING

This age-old indigenous practice involves raising crops to fit the environment, rather than manipulating the environment to fit the crops, and relying on precipitation that falls on the fields and in the watershed that sits immediately above. Watershed water reaches crops through rainwater harvesting and through acequia irrigation.

IDEAS / SOLUTIONS

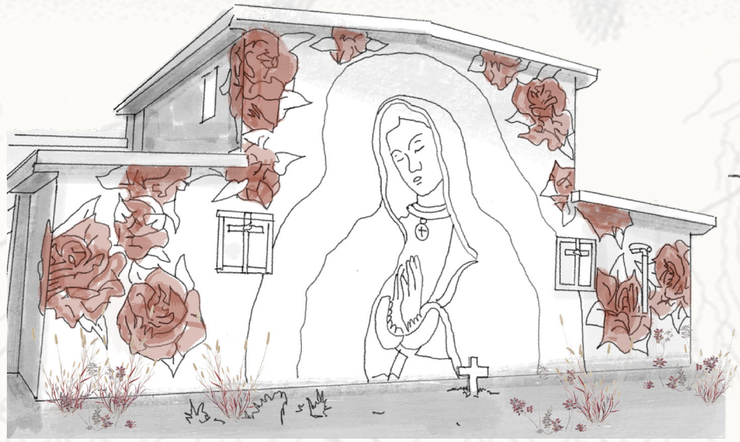
A permaculture orchard is brimming with life; it seems an exceptional place to include art from the local community. From Luis Peña's community mural making to Rose Simpson's phenomenal sculptures, the field next to and the space within the orchard could be home to beautiful local works. The fencing itself could be a work of art and might including willow and stone gabions, seed bag growing mounds, and insect hotels.

NATURAL FENCES/WINDBREAKS

Windbreaks are rows of trees or shrubs that are planted to reduce the force of wind, reducing wind speeds, moderating soil and air temperature, reducing soil erosion and evaporation, and increasing soil moisture providing year-round protection for fruit trees and other crops. Reductions in wind speed can protect trees from mechanical damage and breakage. Examples of good woodbreak trees might include: catalpa, linden, maple, redbud, oak, sumac, willow, pinon.

LOCAL ARTIST SCULPTURE GARDEN AND COMMUNITY MURAL MAKING

Rose B. Simpson
Heights I (original), 2022
Clay, glaze, twine and silver
Overall: 54 x 12 x 10 inches /
137.2 x 30.5 x 25.4 cm



Luis Peña, La Madre Antigua mural, Ojo Caliente, NM

Art in the orchard fields could include fencing walls that are a continuation of community mural work.

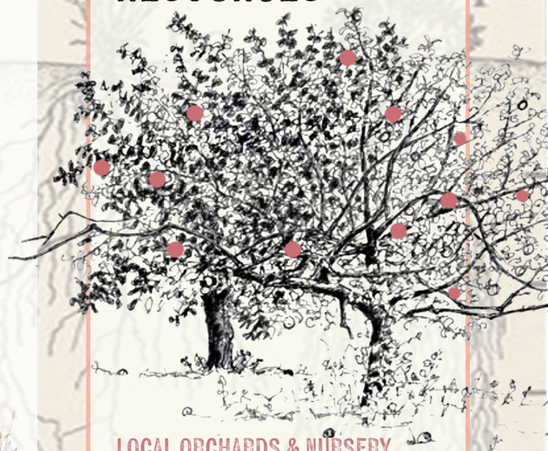
WILLOW FILLED GABIONS

SEED BAG WALL

burlap bags filled wth soil and seeds at the top

INSECT "HOTEL"

RESOURCES



LOCAL ORCHARDS & NURSERY

Fred & Ruby Martinez Orchards
58 County Road 70
Dixon, NM 87527

Manzanar Los Silvestres
21581 US Highway 84
Abiquiu, NM 87510

Rancho Arco Iris
152 NM Hwy 580
Dixon, NM 87527

Tooley's Trees and Keyline Design
Road 1301
Truchas, NM 87523

REFERENCES

The Holistic Orchard: Tree Fruits and Berries the Biological Way
by Michael Phillips

The Tewa World
Space, Time, Being and Becoming in a Pueblo Society
by Alfonso Ortiz

Stefan Sobkowiak: The Permaculture Orchard: www.youtube.com/c/StefanSobkowiak
and the film: *The Permaculture Orchard: Beyond Organic*

Special thanks to Rose B. Simpson (Santa Clara Pueblo, NM) for allowing images of her work to be used on this project.

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