Dry Farming Demonstration

Amy Garrett
Assistant Professor of Practice
OSU Extension Service
Small Farms Program
Introduction

• Cropping options on land without water?
• Climate change: reduced snowmelt, increased temperatures, and drought
• Vegetable growers using surface water for irrigation were cut off early during the 2015 growing season.
• Up to a 50% reduction in summer water availability in Oregon is predicted within 40 years (OCCRI)
What is dry farming?

- Crop production during a dry season like summers in the Willamette Valley and Northern California
- Utilizes the residual moisture in the soil from the rainy season instead of depending on irrigation.
Resources

Steve Solomon
- *Growing Vegetables West of the Cascades*
- *Water-Wise Vegetables*
- *Gardening Without Irrigation: or without much anyway*

Carol Deppe
- *The Resilient Gardener*

David Granatstein
- *Dryland Farming in the Pacific Northwest*

California Ag Water Stewardship Initiative

Widtsoe, John. 1920
The Dry Farming Project

- Work to date
  - Case studies
    - Western Oregon
    - Northern California
  - Demonstration
    - Field Day
    - Sensory Evaluation
    - Preliminary Yield Data
  - Pursuing Grant funding
    - Expand Demonstration
    - Participatory Dry Farming Research
Small Farm News – Summer 2013 edition
Dry farming vegetables: One farmer’s approach to building soil, conserving water and producing great tasting tomatoes
Veneta farmer with 40 years experience

Small Farm News – Summer 2014 edition
Common misconceptions and key points about dry farming: Case study of dry farmer with more than 40 years of experience
Dry Bean Farmer in Elmira

- Grows dry beans for Hummingbird Wholesale
- Uses dry farming/irrigation as a tool to stagger his harvest
How Does Dry Farming Work?

- Starts with the soil!
  - Water-holding capacity
    - Clay
  - Organic matter - For each 1% increase in soil organic matter, soil water storage can increase by 16,000 gallons per acre-foot of applied water!
- 4’ of soil or more (Solomon)
- Nutrient-rich
- Site selection
  - Plants as indicators
  - Web Soil Survey
  - Soil auger

**128B—Veneta loam, 0 to 7 percent slopes**

**Map Unit Setting**
- *National map unit symbol:* 234m
- *Elevation:* 300 to 800 feet
- *Mean annual precipitation:* 40 to 60 inches
- *Mean annual air temperature:* 52 to 54 degrees F
- *Frost-free period:* 165 to 210 days
- *Farmland classification:* All areas are prime farmland

**Typical profile**
- **H1** - 0 to 14 inches: loam
- **H2** - 14 to 39 inches: clay loam
- **H3** - 39 to 60 inches: clay

**Properties and qualities**
- *Slope:* 0 to 7 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Moderately well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
- *Depth to water table:* About 36 to 72 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water storage in profile:* High (about 10.3 inches)
How Does Dry Farming Work?

- Crop/variety selection
- Soil preparation
  - Timing
- Planting technique
  - Plant when and where there is moisture
  - Increased plant spacing
  - Pre-soaking seed
  - Pressing soil around seed or transplant
    - Good seed soil contact
    - Creates capillary action wicking moisture to the surface to help seed germinate and get established
- Surface protection
  - Dust mulch
Sand
Poor Capillarity

Clay; Sandy/Silt Loams
Good Capillarity

Illustration by Moria Peters
Roots Extend To Edge Of Water-Saturated Zone
Illustration by Moria Peters
Crop/Variety Selection

- Tomatoes
- Potatoes
- Watermelons
- Cantaloupes
- Winter squash
- Zucchini
- Dry Beans
- Corn
- Orchard crops
- Grapes
Soil Preparation - Timing

“The biggest mistake I see Oregon farmers making when they attempt to dry farm is that they don't start working their ground at the right time. If they start when it's too wet, they'll never get the tilth right after that. If they work it too dry, they'll never get the moisture back unless they're saved by late rains, which we didn't get last year.” – Retired Dry Farmer
Dry Beans

June 15, 2015

July 27, 2015

September 10, 2015
Squash and Melons

‘Dark Star’ Zucchini

Corvallis, OR

New Moon Organics - Shively, Ca

July 6, 2015
July 15, 2015
July 15, 2015
August 18, 2015
July 27, 2015
September 25, 2015
Tomatoes and Potatoes

June 15, 2015

July 27, 2015

September 10, 2015
Dry Farming Field Day
Dry Farming Field Day Survey

• Why is dry farming of interest to you?
  • 11% - I don’t have water rights on my farm
  • 11% - My well ran dry this year
  • 86% - other reasons
    • Sustainability in a time of climate change
    • Conserving water, energy, and time
    • Weed management
    • Improved flavor

• 93% of them intend to apply what they learned at the field day on their land.
2016 Dry Farming Project Plan

- 3 Demonstration Sites
  - Aurora
  - Corvallis
  - Central Point

- Growing Resilience: Water Management Workshop Series
  - [http://smallfarms.oregonstate.edu/wmws](http://smallfarms.oregonstate.edu/wmws)

- Participatory Dry Farming Research

New to dry farming?

- Select site with deep soil and good water-holding characteristics.
- Start small and expand on your successes!
Dry Farming Project

For more info visit: http://smallfarms.oregonstate.edu/dry-farming-demonstration

Amy Garrett
Amy.garrett@oregonstate.edu
541-766-3551