

Dealing with the Challenges of Growing Tomatoes in the Desert Southwest



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The Challenges



LOW FERTILITY SOIL



INTENSE HEAT



PESTS AND DISEASES

Low Fertility Soil

Low fertility soil = lack of organic material

What does organic material do?

- provides soil structure
- prevents soil compaction
- encourages root growth
- makes water available to plants

Sources of Organic Material



Let's take a poll
What Type of Soil Do You Have?

Sand

Clay

Loam

No idea

What type of soil do you have? (and why you should care)

Sandy soil

Devoid of organic material, so the soil doesn't hold water

Plants need more frequent watering for short periods

Clay soil

Holds water (but not in a way that plants can use)

Plants need infrequent deep watering

Loam: The plant's happy home

5% organic material

Equal Distribution of sand, silt and clay

Holds water

(that's available to the plants!!!)

Have a soil test and see what you have

How I changed my soil



Once upon a time (no, actually it was 2008)



Began with sand



And a dream of growing nice tomatoes



Without chemicals



I tilled in compost for a few years



until

I learned tilling
breaks up soil
structure
(among other
things)

Stopped tilling

Continued adding
compost

Used some cover
crops

Periodic soil tests



2014

Soil Tests

2011 Organic Material 2.1%

2016 Organic Material 7.5%

2020 Organic Material 6.6%

Soil classification in 2020: LOAM



The Challenge of Low Fertility Soil: your options



Improve your soil:

Use compost

Try cover cropping

Build a healthy soil for healthy
plants



Raised Beds



Containers

Tomatoes and Temperatures

Tomatoes don't care for extremes:

Below 50 degrees

Above 85 degrees

Nighttime temperatures above 70 degrees

4 hours at or above 104 degrees

The Challenge of HEAT on Growing Tomatoes

Optimum temperatures for growing tomatoes is 68 - 86 degrees



Growth slows down beyond 86 degrees



And tends to stop around 104 degrees

High Temperatures and Tomatoes



Sticky pollen - no fruit set



Blossoms drop



Flower production reduced



High temperatures stress the plant



Stressed plants are at increased risk for
insect predation and disease

Let's take a poll

What Type of Tomatoes Do Best in Heat?

Small tomatoes

Large tomatoes

Tomatoes indigenous to hot arid climates

Hybrids

The ones your neighbor has grown
successfully for years

The Bigger Challenge: What to Do about the HEAT

Location

Location

Location



Ways to Beat the Heat

Shade (natural or manmade)

Early morning water

Heat tolerant varieties

Mulch

The Challenge of Insects and Diseases: Prevention is Key



Inspect your Plants

Closely
At least weekly (more often is
better)



Good Cultural Practices

Promptly remove diseased plants
Control weeds
Clean tools



Bring in Help

Insect Barrier
Beneficial insects
Companion plants

Curly Top Virus

One of the most common viruses in the SW

Caused by the beet leafhopper that overwinters in mustard plants

Symptoms:

Leaf curl (careful that's a sign of many things)

Color change - yellow leaves, purple veins

No spots or flecks on leaves



Photo from CSU Extension, Tomato Curly Top Virus

Spotted Wilt Virus

Caused by thrips (who love hot dry conditions)

Symptoms:

Color - bronzing of young leaves

Dark spots

Leaves drop

Shunting of whole or half of the plant



Photos from NMSU Plant Clinic

What to Do?

Protection:

Row Cover/Insect Barrier

Shade (leafhoppers don't like shade)

Remove mustard plants

Infected plants:

Remove the plant (promptly and carefully)

Plant resistant varieties (look for the code TSWV)



Soil Borne Diseases: What to Look For

Wilted Plant

Verticillium and Fusarium Wilts. Yellowing leaves, dying lower leaves. If the stem is cut near ground level it will look tan or brown in color inside.

Stunted Yellow Plant

Root Knot Nematodes are microscopic worms in the soil that feed on roots. Frequent problem in sand.

Confirm with Lab Test

Solution: Disease resistant varieties or plant in other areas.

Tomato Hornworm

Catepillars chew leaves and can rapidly defoliate a plant.

Pupae overwinters in the soil and emerge in June

A second generation may appear in late July and August

They are easier to find at night as they glow green under blacklight



Photo from Colorado State University Extension "hornworms and Hummingbird Moths 5.517

Strategies for Keeping Tomato Plants Healthy



Good cultural practices (promptly and quickly remove diseased plants)



Keep tools clean to avoid cross contamination



Control weeds (year-round)



Do not over fertilize



Use shade cloth



Strive for healthy soil

Bring in the Big Guns to Help: Beneficial Insects

One ladybug can eat
5000 aphids in her
lifetime

Praying mantis eat
grasshoppers

Parasitic wasps
destroy tomato
hornworms

Lacewings will eat
aphids, spider
mites, white flies,
mealybugs and scale

Assassin bugs eat
leafhoppers



Plant to Attract Beneficial Insects

Insectary Seed Mix

California Bluebells

Alyssum

Cosmos

Dill

Prairie Coreopsis

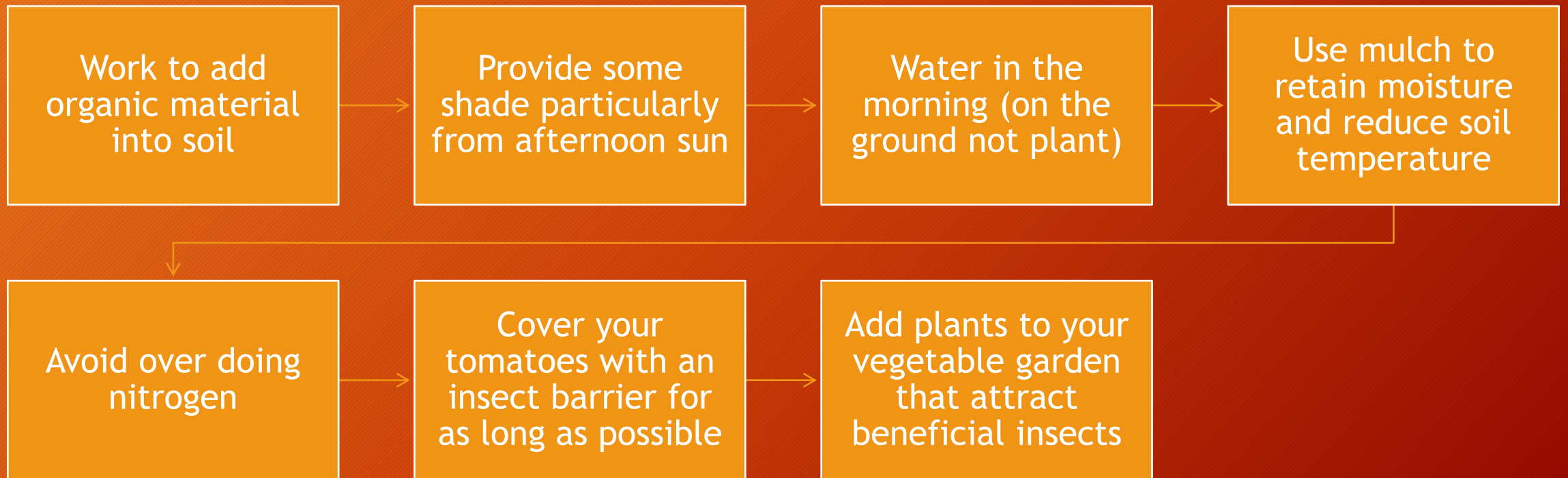
Buckwheat



Interplanting for soil health



Tips for Growing Tomatoes in Sandoval County



Succeed with the Right Tomato Varieties



- Diversify
- Select varieties that do well in the heat
- Small tomatoes tend to produce through the heat of our summers
- Both heirlooms and hybrids can do well
 - Celebrity, Better Boy, Big Beef
 - Paul Robeson, San Marzano, Marglobe, Berkley Pink Tie Dye, Jaune Flamme

Questions?

