Congreso Aapresid | CON LA FUERZA DE Expoagro | CÓDIGO ABIERTO

Ron Rayner, Farmer at A Tumbling T Ranches

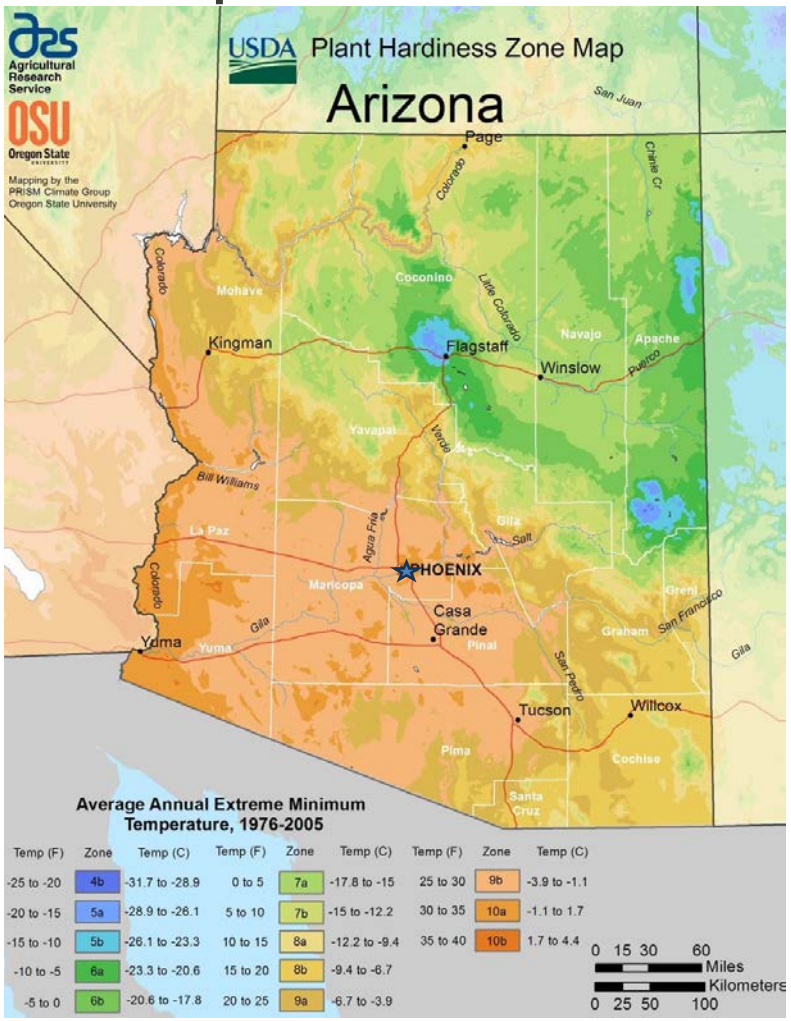
Trial and Error: Conservation tillage agriculture in Arizona

A look at nearly thirty years of pioneering no-till and minimum-till farming practices in the desert Southwest

A Tumbling T Ranches - Generational Family Farm

Since 1913

Unique Characteristics of our Environment

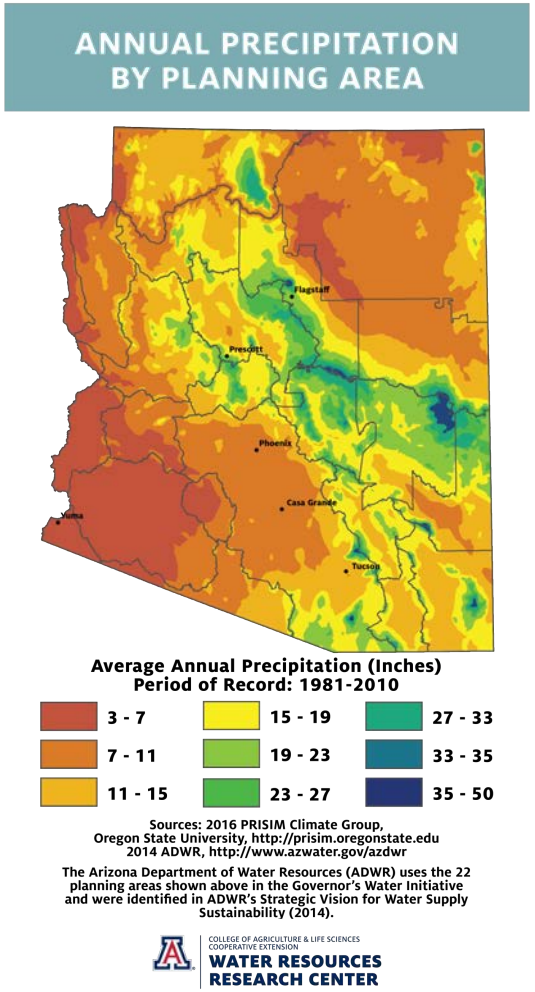


Arizona's climate is variable in both temperature in precipitation as a state.

Our base of operations is located in the west valley of Phoenix, Arizona, in Goodyear. The average annual rainfall is approximately 7 – 11 inches (178 – 280 mm), and summer daytime temperatures can easily exceed 115 degrees Fahrenheit (46 degrees Celsius).

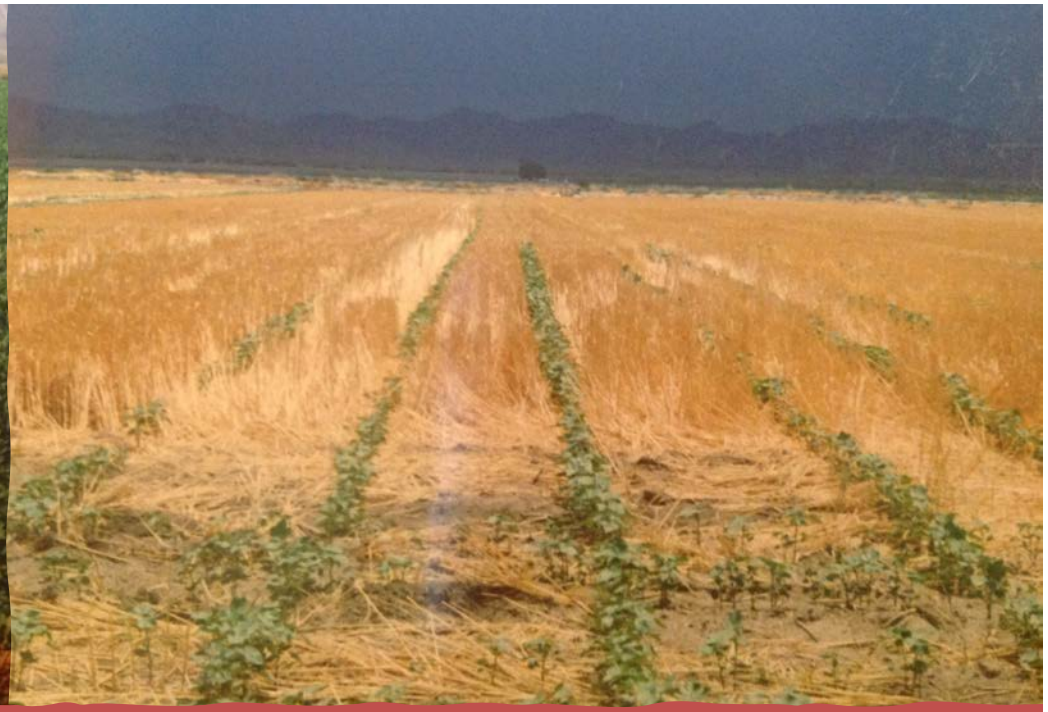
Understandably, this limits summertime production to heat resistant crops.

All of our crops are entirely irrigated, as there is not sufficient rainfall in most years to even germinate crops, let alone grow them.



Further Environmental Challenges – Salinity

- Our border flood system matters not just for irrigation, but also for leaching salts
- Groundwater in our area is high in natural salts, up to 3000ppm TDS
- Only salt tolerant crops can be grown



The Beginning 1996

Starting almost thirty years ago, we created a crop rotation pattern that worked for us economically and improved soil health.

Crop Selection

For our climate we devised the following rotation of crops based on the seasons and what benefits the soil.

Half of the farm is in alfalfa, which is continually growing all year long. In the winter, the other half is in wheat, which is double cropped to cotton in the summer.
We average about 10 cuts a year on our alfalfa. If there is demand, we will incorporate a forage crop such as corn, sorghum, or forage wheat.

Cotton (Late May - Early December)
Wheat (Late December - Mid May)
Forage (Early July – Early October)

Year-round Alfalfa, 3-4 year life



Wheat Follows Alfalfa

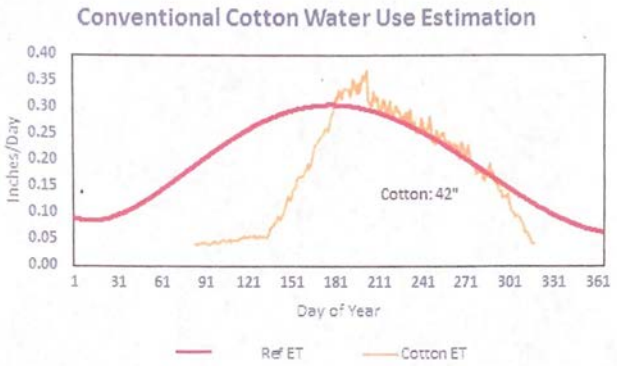
Cotton Follows Wheat

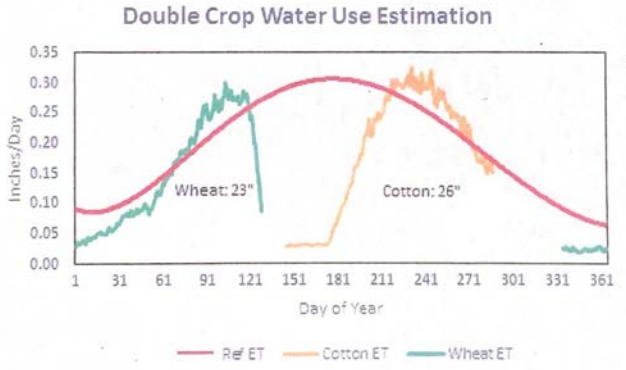
Crop Transitions

- No deep ripping, all harvesting methods leave as much plant residue as possible on the soil.
- No plowing for over thirty years.
- Minimum-till or no-till equipment is used, like no-till planters, strip-till machine, and shallow finishing ripper.

Results: Anecdotal and Scientific

- Much less irrigation water use, 49 inches (1240 mm) total water use on two crops versus 42 inches (1067 mm) for a single cotton crop.
- Improved soil organic matter from 0.5% to 2.5%.
- Cooler soil temperatures at the surface, and reduced evaporation





Continuing to Today and the Future

- Salinity reduction technology to improve water efficiency
- Alternative irrigation methods, subsurface drip, pivot sprinkler, etc
- Continuing to improve our understanding of soil health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