

Impacts of Drought and Aridification on Agriculture in western Colorado

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My Introduction

I farm on Surface Creek mesa.

I participated for 5-6 years on studies concerning deficit irrigation and demand management.

Drought and aridification are not a happy subject for a farmer.

My age makes me well on my way towards qualifying as a grumpy old white guy.

I'll try not to be completely pessimistic.

2018 Drought Impact

Ranchers sold more of their livestock than usual

Some farmers took jobs off the farm for a while

Both my neighbor and I went and got jobs off the farm

In general during a drought the agricultural community hangs on, dips into its reserves, and has faith that better days will come.

Dryness becoming the normal is another thing. I'll focus the rest of my talk on that.

Looking at Aridification from the perspective of Economic studies

Water is a raw material for a farmer or rancher

We use it and other raw materials and convert it into a finished product such as an ear of sweet corn, a glass of wine, or a bale of hay.

During Aridification the price of water will likely go up and the availability will be less reliable.

For a manufacturing enterprise if the price of one of their raw materials goes up or the supply gets unreliable, it's a bad thing.

Any solution to aridification we come up with tonight will likely not be as good as the same solution would be under the conditions of plentiful, inexpensive water.

I call this the "Chocolate sauce principal":

Everything tastes better with chocolate sauce on it

Everything goes better for the farmer with a good supply of water

Looking at Aridification from an Ecological Perspective

When a species is adapted to a specific environment and it is faced with a change in its environment it basically has 3 choices:

Adapt

Migrate

Die

The farmer and rancher are the species

Adapt

ISSUE: As aridification happens the farmer will likely have less water to use.
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Adaptations

Adaptation 1) Install more efficient irrigation systems --Don't lose any of the water you have

Examples: move away from furrow irrigation to sprinklers, subsurface drip, microspray

A look into our possible future: Look at Utah, California or Israel

Tangible impacts of current aridification:

In our area farmers have been installing more efficient irrigation systems for many years.

One motivation has been to overcome drought on certain parts of the fields or farms.

Rate of installation may increase if aridification continues

Adaptation 2) Change to lower water need crops

Examples: alfalfa to oats corn to hemp

Tangible impacts of current aridification:

Neighbor dairyman who is thinking of switching from alfalfa and corn to winter wheat.

Caution:

We cannot automatically say if profits will go up or down.

Using less raw material and making more money sort of sounds too good to be true so it probably is.

I make more money raising alfalfa than oats

ISSUE: As aridification happens water will likely become more expensive.

Adaptations

Adaptation 3) Change to higher value crops -- The high cost of water is offset by the high revenues of the crop.

Examples:

Animal corn to sweet corn

Alfalfa to organic vegetables

Grass pastures to hops

Tangible impacts of current aridification:

It is much more common to see a new farmer go into high value crops.

This due to high cost of land and perhaps water

Caution:

It is not automatic that higher value crops will translate into higher profit.

Revenues – Costs = profit

Caution:

The higher value crops will need water. Maybe as much water as the low value crops.

You can afford to pay more for the water, but can you get it?

Tangible impacts of current aridification:

Neighbor this summer who watered small field of hemp with domestic water

Adaptation 4) Lease your water rather than consume it

If your raw material is worth a lot of money just sell it rather than using it for production

Demand management – next week

Issue: The attribute of resiliency is an important concept in ecology related to survival.

Example to illustrate resiliency:

Native short grass prairie of eastern Colorado not very productive.

Wheat fields more productive

Disaster during drought and dustbowl of 1930's. The native grass was much more resilient

Example:

High value crops can be high cost to grow. If you have a high cost crop that dies due to drought you may not be very resilient economically

If you have to have a good crop every year to make your loan payments you may not be very resilient economically.

Tangible impacts of current aridification:

My neighbor in the valley outside my dining room table

Has grass pastures, not much fancy farming machinery, not much fancy irrigating equipment. Raises a small herd of cows

Puts up some hay every year

Stores extra hay instead of selling it for cash

Made it though 2018 pretty much unharmed. Looks as if she's in for the long run.

Adaption 5) Intriguing that maybe the best way for us to adapt is to go to low cost, low risk agriculture even if it is also low productivity by some standards.

Migration

Not seeing much of it at this time.

Tangible impacts of current aridification:

Neighbor dairy farmer has migrated most of his crop production to Gunnison Valley

Neighbor across the fence who sold out and moved to Ohio to raise hay

Die

Concerning death: Sometimes I'm asked: Don't people realize that they need us farmers to grow food for them?

Let us acknowledge:

There is better agricultural land in the United States than western Colorado

There are a lot of people who want the Colorado River for drinking water

Phoenix water managers: "Die farmer man die."

Conclusion

If I had to put money on the survivors or aridification it would be:

Relatively small scale farmers and ranchers raising human food for specialty markets

Low intensity, low risk, high resiliency operations like my neighbor in the valley.

My story about being chewed out by Ben (Jerry.)

I think it is likely that if we farmers make a few changes and spend a little money, most of us will make it.