Components of a Dryland Field

Berms:

Berms are essentially built up rows of soil, creating a small ridge. The key concept of these is to stop and hold

that sheet flow for as long as possible, in your desired location. Base the size of your berms off the amount of sheet flow you get. This could require some trial and error before figuring it out, so be patient and be observant and you'll get the hang of this pretty quick.

Contours:

Contours refer to subtle elevation changes in



and among your fields and beds. These differences in elevations among fields and slopes in beds ensure that beds and fields flood entirely

and in the correct order, going from highest in elevation field to lowest elevation field. Subtle slopes in beds make sure that water fills the entire bed.

Beds:

You can use beds inside your berms to plant your

plants in. Making sunken beds will further help concentrate water to plants but is prone to sedimentation build up and can bury seeds and seedlings during high water flow.



Ditches:

Consider how much sedimentation you will receive from each storm. If sedimentation build up is a concern, building small ditches along the inside border of your three berm walls can catch sedimentation and alleviate build up.



What is Dryland Farming?

Ak Chin Farming is a traditional agricultural technique that utilizes captured flood waters from rainfall to water crops. This technique is not irrigated with irrigation lines or with large machines that water their fields, but instead uses different water collection/distribution techniques. This desert farming technique has historically been practiced in regions of the Southwest and in conjunction with appropriate crop choice, can present a great opportunity for agriculture in the southwest.

Where does the water come from?

The harvesting technique used is based on the type of local water available as well as local geography. Ak Chin Farming is heavily dependent on an understanding of water flow and effective catchment systems after heavy rains.

What is sheet flow and why is it so important?

A consequence of a high amount of rainfall in a short amount of time, typical of monsoons, is sheet flow. Sheet flow is a phenomenon in which water doesn't have time to absorb into the soil and sits on the surface. Eventually this piling up water begins to move as a whole sheet on the most minimal of slopes. The strength of sheet flow is influenced by multiple factors which include degree of slope, length of uninterrupted slope, amount of rainfall, soil moisture content, topical geography, and more.

To Learn More:

Contact the Ajo Center for Sustainable Agriculture at AjoCSA@Hotmail.com or reach out to us on social media!



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AK CHIN FARMING: MOUTH OF THE WASH



Roping Arena Dryland Field

This dryland field is located just outside of Ajo, next to the roping arena just off N Well Road. Average rainfall here is around 7 inches a year, but averages in recent years have been less. The slight slope on the large basin at this location allows for stronger sheet flow during the heavy rains of the monsoon season.

Technique: Sheet flow capture without sunken beds

•This dryland farm has heavy berms around 3 sides with one open side facing the direction of oncoming sheet flow. This open side allows water to enter and the surrounding three berms then trap the water in place.

•This captured water then sits around the plants, allowing enough time for the water to saturate the soil.

•The rows in this field are actually separated into four parallel sections, each separated by a small berm. Each section is on a different contour, meaning each section is at a different elevation, with the first section exposed to sheet flow entering the dryland field being the highest in elevation, ensuring this section fills up first. Once this first section is nearly full, the berm will break, allowing water to enter the second section, which is the next highest in elevation. This continues until all four sections within the dryland field have received water.

•Due to the amount of water catchment at this location, sinking the beds to further focus the water is not necessary. At this location, sheet flow moves at a high speed and with great force. In response, we build these berms extra-large to endure the force of the water.

•A small trench on the inside of the berms to allow for any sedimentation to settle there and not over seedlings.

New Fields Dryland Field

This dryland field is located approximately 100 mi SE of Ajo, just about on the US-Mexico border. Rainfall at this location is a little more than that of Ajo and the local geography creates sheet flow during the heavy rains of the monsoon season.

Technique: Sheet Flow Capture + Sunken Beds

•This dryland field is bermed up around 3 sides with one open side facing the direction of oncoming sheet flow. This open side allows water to enter and the other three berms then hold the water in place.

•In addition to the entire field as a whole being bermed up on 3 sides, each individual sunken bed is bermed up on 3 sides with an



•Once this water is captured, it sits around the plants, which allows time for water to saturate the soil.

•The sunken beds at this location allows for the water to be further focused around the plants so that even when sheet flow is light, sufficient water will reach the plants in these beds.



Cowlic Dryland Farm

This large dryland farm, operated by Tohono O'odham Community Action (TOCA), which is dedicated to

creating a healthy, sustainable and culturally vital community on the Tohono O'odham Nation, harvests water not via berms, but harvests rainfall into large water catchment reservoirs, which can then be utilized



later during gaps or even after monsoon season has passed. With 55 acres total, this Dryland Farm is actually the largest floodwater operation in the state.

Technique: Water catchment reservoirs, drawing from the Vamon wash system



•These dryland fields are a series of fields connected to an irrigation canal. These water catchment reservoirs, which collect water are separate from the fields and mechanical pump is used to draw the water up from the pools to then flood the fields.

•Each of the beds, in each field, run parallel to each other and are connected to a main irrigation canal that

is fed by a mechanical pump flooding this canal by drawing from water catchment reservations. Beds are aligned with contours, ensuring these rows fill



up in the correct order, watering all of the crops in each row.