

Life at Bosque Redondo Reservation

Lesson 3 – Crops

By Rhonda Gutierrez

Essential Questions:

1. What did the Native Americans grow?
2. Were they successful?
3. What problems were there?
4. What consequences to failed crops?

Objectives: Students will be able to...

1. Describe the timeline of crops
2. Categorize the crops
3. Appraise what went wrong and why
4. Evaluate if the choice of location was doomed from the start.

The site for Bosque Redondo was picked by General Carleton as he said because of the farm land and the available river. Though technically that is true, in reality, the Pecos River was very irregular in flow, prone to flooding and going nearly or completely dry, alkaline and within the Apache and Comanche territories. One of the tributaries that flows into the river is Rio Salado which means salty river in Spanish. In many places the river is hemmed in by sharp banks and not easily accessible or very sandy and prone to erosion.

Today Fort Sumner community is a small farming community. The success required the river to be dammed so that flow could be regulated, addition of fertilizer and pesticides, electricity, modern farming equipment and a population that is sustainable. The current population is about a 1000 people vs 10,000 in the 1860's.

Carleton in February of 1852 reported the Bosque Redondo was a perfect location for a fort. "...The majestic cottonwood grove constituted an almost endless supply of wood. The soil was very rich, and water abounded the year round." (Thompson, pg 14). However others disagreed and Clairborn, surveyor from Mounted Rifles referred to it as "altogether unfit for a post." However, Carleton commissioned the location as Fort Sumner in 1862.

In 1863, the first people to be brought to the fort were the Mescalero Apache and they immediately began constructing the fort buildings and preparing the land. They lacked tools to begin with and knowledge. They were a nomadic people and didn't practice agriculture. Their numbers didn't exceed 500. Then later in 1863, Navajos began to arrive. The Apache were first given the lands in the north but as the Navajo arrived, the Apache were moved towards the south and the Navajo who were in much greater numbers were encamped in the north. The Native Americans were settled outside of the fort and the farm land. Basically, there was not one growing season that the crops were successful from 1864-1867. In 1868, the last season, the Navajo refused to plant and in June negotiated a treaty and left the Bosque Redondo reservation. Crops planted included wheat, corn, beans. The reasons for failures were bug infestation,

Materials

For the Activity – Luck of the draw:

Brown fabric or construction paper enough to cover about 4x6'(land)

Blue fabric or paper (river)

Blue ribbon (acequia madre)

Blue yarn in various lengths and a few with knots to indicate floods (acequia water)

Construction paper (buildings)

Chips or tokens for record keeping

Optional: set of index cards (20)

Farm Map

Key Concepts

Acequia Madre

Irrigation practices

Farming Practices & Limitations

Grades

Upper elementary through high school

flooding, drought and problems with the irrigation system. The other problem as the crops began to ripen was theft as the people were hungry and being fed on inadequate rations.

Every year the acequia madre, a 7 mile main irrigation channel that circled the farm land and re-entered the river further south, was required to be repaired. Intermittent flooding and lack of steady flow in sandy soil meant the channel collapsed each season. The Apache and Navajo men dug with shovels the main channel, a diversion dam and the smaller ditches. They didn't have all the equipment needed to till and harvest crops and used hoes. For example, the first year, the Apache men harvested wheat using their hunting knives.

Timeline

1864 – February: Navajos and Mescalero Apache worked on 7 mile acequia madre or main irrigation ditch.

May-July: Navajo and Apache men clear approximately 3000 acres for planting and planted mostly corn, but also sorghum, rice and wheat.

Aug-Sept: Crops failed due to invasion of the cut worm or army worm. Sown acreage would typically yield 180,000 bushels of corn and the harvest was less than 1/10th that amount.

Apache produced 15,625 lbs of wheat along with small harvest of melons, pumpkins, chili, green beans and tobacco. Wheat throughout the territory was destroyed by rain and hail.

1865 – Spring: Increased up to 4000 acres

Dec-April: planted 12068 trees

Harvest once more failed due to cut worms, flood and salt in the soil from the water from the river.

November: Mescalero Apache escaped.

Harvest:

	Wheat	Corn	Beans	Corn Fodder
Navajo	34113 lb	373,909 lbs	3040 lbs	572,709 lbs
Mescalero Apache		49,673 lbs	475 lbs	150,000 lbs

1866 – Cultivation by Navajos increased to 6000 acres including rebuilding irrigation ditches. Planted corn and various other crops but not wheat. 50% failure of crops. Yield: corn: 201,420 lbs and 156,800 lbs of corn fodder. Military cited that the change resulted from change in personnel from NM volunteer to US regular army and the new military men weren't invested in making the crops successful and lacked knowledge of farming.

1867 – Navajo planted 3000 acres, rebuilt irrigation ditches and repaired diversion dam after flooding from spring run-off and built adobe walls for gardens to use as nurseries.

Once more crops failed due to "scarcity of rain" (Thompson, pg 142). Noted problems include dam washing out, water didn't flow into the acequias due to diversion dam failure, little rain and high temperatures. Crops replanted in July but there was no rain so total crop failure.

Discussion about the crops could include the challenges that the area posed for farming such as: the variability of the river water, the heat of the area, the density of the population, lack of equipment and bugs and saline water.

Luck of the Draw Game

This activity is modified from activity of the same name as part of the Acequia Activity from the Maxwell Museum at <https://maxwellmuseum.unm.edu/sites/default/files/public/kit%20curriculum%205-23-2019.pdf>

There is some preparation work that is required for this activity. The materials list includes brown paper large enough to cover about a 4' by 6' space. If you access to a large plotter printer, you can print the associated map but most people do not so having the students create the geography from paper is how these instructions are written. Other materials: blue tissue paper or blue paper to represent rivers, blue ribbon of about 7' long to represent the acequia madre, green markers to draw out the fields like the markers and black markers to draw the avenue and the buildings. Then blue yarn cut in various lengths to represent the amount of water that will flow through the irrigation ditches into the fields. A few will have a knot to indicate a flood which means all crops ruined. The number and lengths of blue yarn are: 3", 6", 9" and 1'. Suggest cut more of the shorter than the longer yarn threads as the area is usually in drought conditions. Then tie a knot or add a bead to at least 20% of the threads to indicate floods. You can then put all the threads in a bag after each round and the idea is that the students can't see the lengths so it is more like drawing out the thread.

Students will play the Luck of the Draw game to model the components of irrigation and the reality of the variability of water availability and crop failure at the Bosque Redondo reservation.

Process:

1. First be sure to go over the history of crop failure with the students and how the river flooded and at other times went dry. It could be helpful to discuss the soil is primarily sand and that along with intermittent flooding caused erosion in the ditches and required constant repair and digging. The diversion dam was also made from dirt and it would wash away. The Navajo and Apache dug everything using shovels and hoes.
2. Next, explain that the class will work together to create a waterscape and prepare a model of a river and fort. Find a large floor space (size dependent upon how many "boards" the students will be creating. Each "board" is best to be 4x6'). Lay the brown paper down which represents the land of Bosque Redondo according to the map.
3. Next, take the light blue colored paper or tissue paper, which will be the river, bunch them up and lay them along the length of the brown fabric, shaping curves and meanders that a river would naturally have roughly following the shape of the river or at least the path of the river indicated on the map.
4. Then set up the natural features in and around the river; the areas referred to as subject to inundation and slough and describe what those are and why those wouldn't be used for farming. These areas were often flooded in the spring and created boggy areas. Briefly discuss how a natural river system acts, and particularly the Pecos River which is fed from the Sangre de Christo Mountains and tributaries such as Rio Salado (Salty River). Discuss the flow variability due to winter snow melt to summer droughts and flooding as the river plains drain in rains into the Pecos River. The other component to suitability for farming would be the slope to the river as much of the river had steep banks.
5. Next add the fort buildings, the Avenue (trail going out of the fort) and several "farm houses." Then add the segmented agriculture fields along the river and arrange an acequia madre (using the blue ribbon) from the river, around the fields and back to the river. Again in the rough approximation of the map provided.
6. Now the model is ready for you to play the game. Divide your class up in groups of 4-5 students each. They will be the farmers that will work the land off of each acequia. The object of the game is to grow as much food as possible in a growing season. Groups will decide at the start of the growing season, how many fields they will work, between one and five fields depending upon the

number of students playing. The challenge is not knowing how much water they will have in any one growing season. If they have enough water to irrigate all their fields in that growing season, they get one point per crop. If they do not have enough water for all their crops, they earn zero points for that growing season. The amount of water in a growing season is determined by the length of a piece of yarn they select for that round. Make sure they understand that the length of yarn represents the volume of water delivered to their crops over a period of time. A long length of yarn may irrigate their crops for the whole season provided they don't have too many crops to water. A short length will either irrigate few crops per season or maybe even no crops per season.

7. Keep track of the points each group earns for each round on the board. They can get chips or other tokens per field that had enough water to grow crops or points. Nice thing about a crop token such as a chip is ease of counting and keeping track.

Now, complete these steps for each of the 3 rounds:

1. Have each group discuss how many fields (depending upon how many fields available and how many students playing) they will work for this growing season (round). Their hypothetical discussions can include whether there was a wet or dry winter, determining how much snow pack will melt, run off and be available in the spring for irrigation. What the forecast is for a rainy spring and summer. They can also determine how many of each type of field (gardens, pastures, cropland or orchards) they will plant/work.
2. Have one person from each group pull a piece of yarn from the baggie.
3. The students will weave the string from the acequia madre into their field and see how far it goes.
4. If they have enough water to irrigate each of their fields, they will earn a point for each field. If they do not have enough water to irrigate each of their fields, they will earn 0 points for the round. Record the point value on the board for each group. Yarn pieces with a knot in them are seasons in which there is a catastrophic flood. They will lose all crops for that season and earn zero points.
5. For older students, you can assign a dollar value to the types of crops. Determine how much needs to be invested for each crop and how much profit a successful yield will provide. Groups can determine after three seasons (rounds) whether their investment is profitable. At minimum, discussion can be around what happens if they aren't successful in growing crops.
6. When all four rounds (for the four years of planting) are completed, determine which groups were successful in their farming and which were not. This game only focuses on water as a limiting factor in production. Discuss other factors that can limit production (invasion of pests, poor soil quality such as sand and salts, etc.) How is this game and model like the actual practice of farming? How is it different?
7. Once done, have the students compare their results to the actual results of the Bosque Redondo reservation to see how the game compared to the reality. Then have the students discuss what made their results different and what was similar. Bugs were a huge problem which will not appear in this game.

Options – since other things figured into the crop failures at Bosque Redondo, you could add a component such as a set of cards with bug or salt or hail and blank cards and have the students after drawing a string then uncover a card. If they get a salt, hail or bug card means a loss even if they have enough water. Blank cards means nothing else occurred in that field and if they get enough water then they get a point.

Standards:

Common Core: Grade 6- 8: 1, 2, 4, 7, 8, 10, Grades 9-10: 3, 4, 5, 7, 10, Grades 11-12: 2, 3, 4.

History: Grades 5- 8: History: 5 – 8 & 9-12: Students are able to identify important people and events in order to analyze significant patterns, relationships, themes, ideas, beliefs, and turning points in New Mexico, United States, and world history in order to understand the complexity of the human experience.

1-D: Research historical events and people from a variety of perspectives.

History: 9-12: Use critical thinking skills to understand and communicate perspectives of individuals, groups and societies from multiple contexts.

Resources

Grochowski, Amy, Hart, Angela, Minette, Carolyn, and Shea, Diana. *El Agua es Vida: Acequias in New Mexico*. Maxwell Museum.

Thompson, Gerald. *The Army and the Navajo*, 1976, The University of Arizona Press.