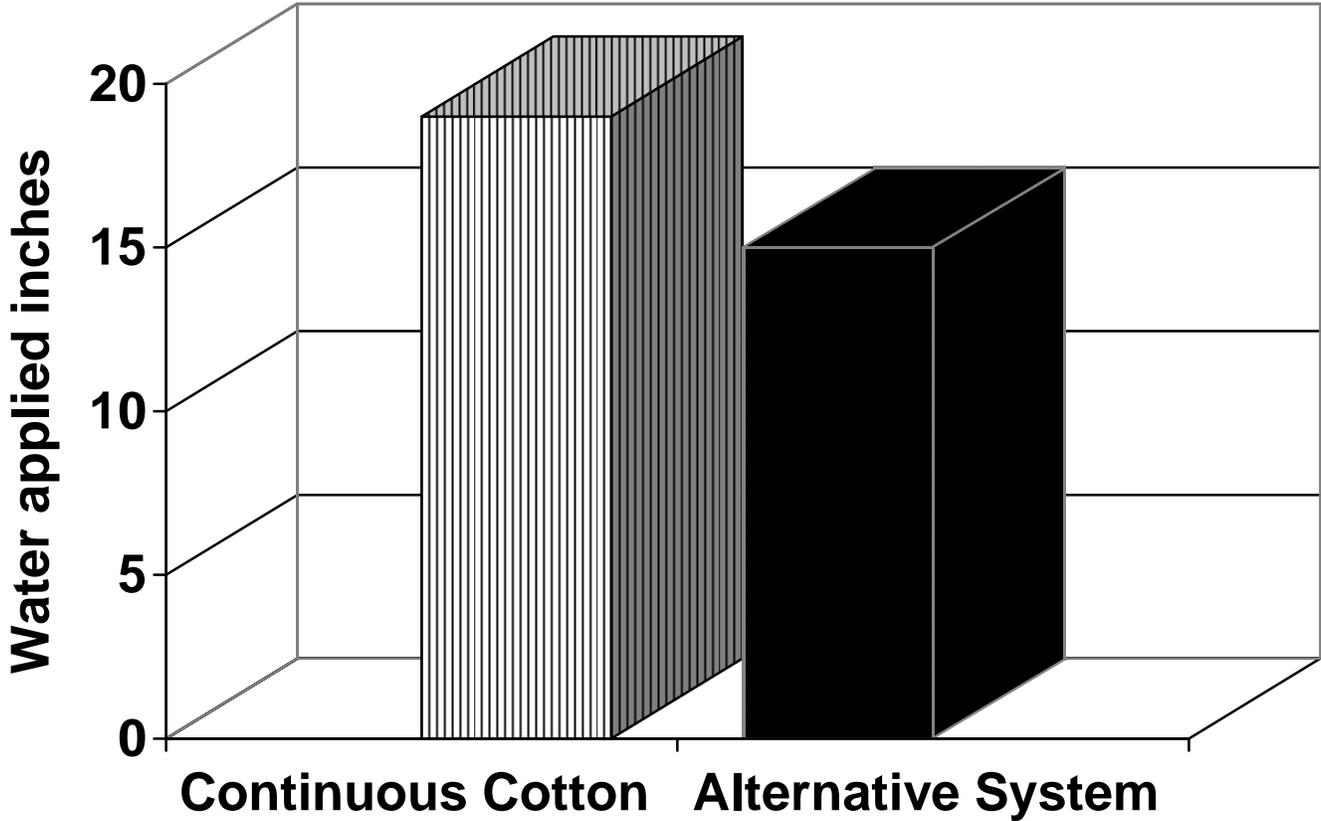


Teacher Manual

Crop Type	Why is it used?	Contribution to the Project
Cotton	Cotton is a very large part of the economy in the Southern High Plains and the area is set up for cotton production. Since cotton is such a major crop in the area, it was decided that the sustainable system should continue cotton production to a certain degree.	The climate and soil of the southern economy in the Southern High Plains is favorable for growing cotton. Cotton will continue to be a major commodity in the Southern High Plains.
Rye	A cool-season crop was needed that could provide forage during the cooler months of the year. Rye is a popular cool-season grass and is being used to determine if it is the best of the cool season grasses.	Provides forage for cattle in early spring and in the winter months. Rye also acts as a cover and rotation crop for cotton. When the rye is terminated and cotton is planted, the rye provides much-needed organic matter for the growing cotton.
W.W. B- Dahl Bluestem grass	W.W. B- Dahl was chosen because it is very drought-resistant grass that provides high quality grazing. Since saving water is a main goal of the project, a drought-resistant grass was chosen so less water could be used. There is also a small market for bluestem seed that can be harvested in October.	The bluestem grass provides a high-quality, palatable forage for the cattle, uses minimal amounts of water, and the grass seed can be harvested and sold to provide more income for the project.
Wheat	To complete the rotation of the system, another cool-season grass was needed. Wheat is a very common cool-season grass and provides high quality forage for cattle.	Provides forage for cattle in early spring and in the winter months. Wheat also acts as a cover and rotation crop for cotton. When the wheat is terminated and cotton is planted, the rye provides much-needed organic matter for the growing cotton.
Cattle	Cattle are used primarily for three purposes: <ol style="list-style-type: none"> 1. Graze the bluestem grass (which is drought resistant and will save water) 2. Provide another source of income for the project 3. Nutrient recycle 	The cattle provide diversity to the system. With a traditional row crop such as cotton, if something happens to the crop or the price is not good at harvest, then the producer may end up losing money that year. The cattle provide another source of income, and if for some reason the cotton crop is not good on some years, there will still be money from cattle coming into the system. Furthermore, the cattle do serve as nutrient recyclers by returning some organic matter back to the soil in the form of manure.

After collecting data from the project since 1997, the research team has identified three major successes of the project.

Success # 1 – The alternative system is saving water

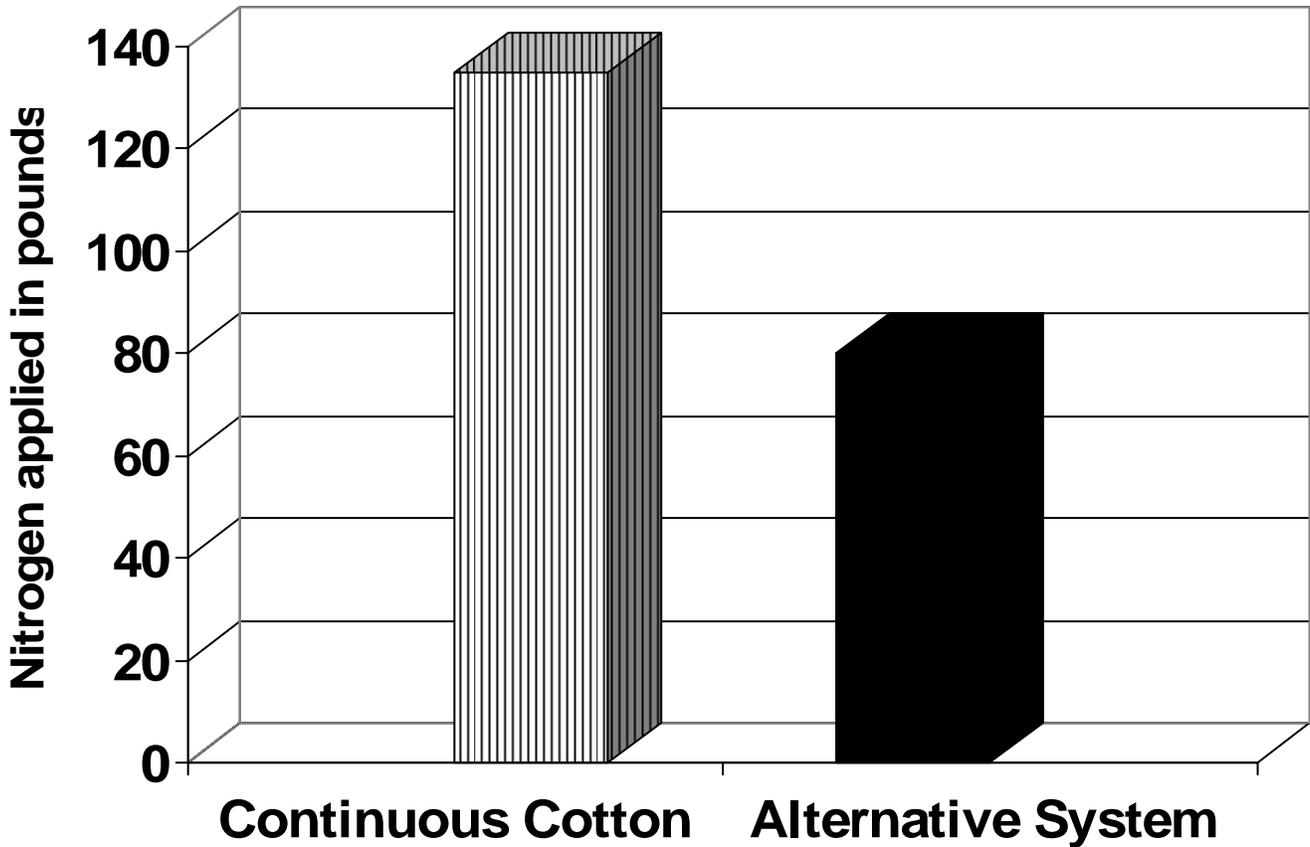


In the graph above, the continuous cotton uses approximately 19 inches of water and the alternative system uses approximately 15 inches of water. Determine the percentage of water saved in the alternative system.

Water saved _____%

Answer is: 22% $15/19 = .78$ $1 - .78 = .22$

Success #2- The alternative system requires less fertilizer

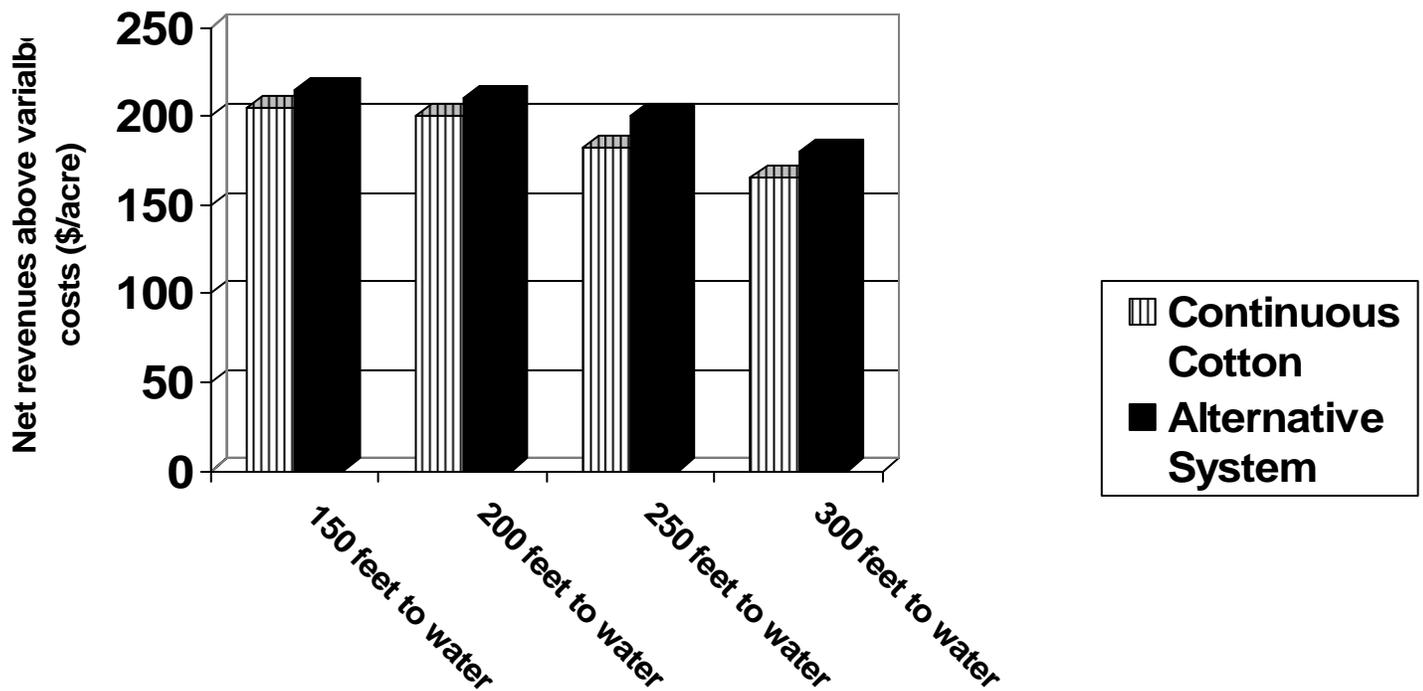


In the graph above, continuous cotton uses approximately 135 pounds of nitrogen fertilizer and the alternative system uses approximately 80 pounds of nitrogen fertilizer. Determine the percentage of fertilizer saved in the alternative system.

Nitrogen fertilizer saved _____%

Answer is: 41% $80/135=.59$ $1-.59=.41$

Success # 3 – The alternative system is more profitable



In the graph above, looking at the 150 feet-to-water columns, continuous cotton made about \$205/ acre and the alternative system made about \$215/ acre. Determine the percentage of profit generated by the alternative system.

Percentage profit _____%

Answer is: 5% $205/215 = .95$ $1 - .95 = .05$

In the graph above, looking at the 300 feet-to-water columns, continuous cotton made about \$165/ acre and the alternative system made about \$180/ acre. Determine the percentage of profit generated by the alternative system.

Percentage profit _____%

Answer is: 9%. $165/180 = .91$ $1 - .91 = .09$

As the depth to water increases, do the profits from the alternative system increase or decrease?