

Texas Cotton Farmers Face a Water Problem Seen From Space

NASA images show drought hitting cotton fields while a key underground water source keeps shrinking.



A dry cotton field with cracked soil, an irrigation system in the distance, and a satellite overhead.

Satellite images from NASA show a harsh **drought** spreading across **cotton** country in the Texas High Plains, according to NASA's Earth Observatory. In an image taken on September 9, 2026, fields around Lubbock looked brown and bare. An image of the same area from September 22, 2025, showed much greener land during a healthier growing season. This matters beyond Texas because the region is America's largest cotton-producing area. Cotton is the fiber used in many T-shirts, jeans, towels, and other items people use every day.

The drought hit especially hard on dryland cotton, which is cotton grown mostly with **rainfall** instead of water pumped onto fields. Some farmers remembered terrible years in 2011 and 2022, when huge parts of the dryland crop had to be abandoned. In 2026, NASA reported that one Lubbock County farmer said about 90 percent of her dryland cotton was dead. That is not just a farm problem. It is also an Earth science problem about how weather, soil, plants, and water systems connect.

One of the biggest concerns is the High Plains **aquifer**. An aquifer is an underground layer of rock or **sediment** that stores water, like a hidden natural **reservoir**. Farmers pump water from it to irrigate crops, which means adding water to fields when rain is not enough. But the aquifer has been dropping for decades. NASA cited U.S. Geological Survey data showing that the water table, or the top level of underground water, has fallen by 25 to 100 feet across much of Lubbock County since around 1950. In some counties farther north, the drop has been 150 feet or more.

The satellite images also show strange green shapes: half-circles and quarter-circles in otherwise dry fields. Those shapes come from center-pivot **irrigation**, a system in which a long **sprinkler** arm moves in a circle around a central point. Some farmers now water only part of each circle because there is not enough groundwater to cover the whole field. NASA said several wells stopped working for some farmers this summer. When a well can no longer bring up water, crops cannot count on it during a dry spell.

The story also includes playa lakes, which are shallow lakes that appear and disappear depending on rainfall. Many were dry in September 2026. These lakes matter because, when they work properly, rainwater can collect there and seep down to **recharge** the aquifer, meaning refill it. NASA reported that the Texas High Plains has more than 19,300 playa lakes, but about 80 percent have been changed by plowing or filled with sediment, which is dirt and other material carried by wind or water. That can stop them from helping water move underground.

Recent rain in September and October helped, and NASA said it was aided by El Niño, a repeat-

ing climate pattern in the Pacific Ocean that can change weather in faraway places. But the U.S. Drought Monitor still showed that more rain was needed. The problem is not only this year's weather. It is also about long-term choices: what crops to grow, how much water to pump, how to protect playa lakes, and how satellite data can help people see changes too large to notice from one field. Researchers are even using deep learning, a kind of computer pattern-finding often called artificial intelligence, to track playa lakes over decades. The question is not whether water matters. It is how communities decide to share and protect it when there is less than before.

Written from reporting by NASA.

THINK IT THROUGH

1. If a farming region depends on a shrinking aquifer, who should have the strongest voice in deciding how that water is used: farmers, local governments, scientists, or the wider public? Defend your choice.

A strong answer: A strong answer should weigh expertise, economic need, public resources, and the effects on people who do not own farms.

2. Should farmers in dry areas be encouraged to keep growing the same crops with better technology, or to change what they grow and how they use the land? Explain the trade-offs.

A strong answer: A strong answer should discuss jobs, traditions, food and fiber supply, water limits, and the risks of relying too much on technology.

3. Satellite images can show drought and water changes from above, but what important information might they miss on the ground?

A strong answer: A strong answer should consider human decisions, local knowledge, crop costs, well conditions, and details satellites may not directly measure.

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S S I A C R S T L T O O Q N A O G E
I N N R R A A E E E T G F O T O N G
I R G I A R T I H M O S T S U N I M
K E R S N L E A R H R I O A T N I U
E S I I A R L C L V E T O R A S D E
S E O K G H L T H E D I T E L L I K
G R V E T A I R E A Q U I F E R E S
C V V I E S T T G S R L E O T N O T
R O G T E C E I T N S G O R L C L E
T I E N E E O D O I N E E F A H M N
O R R R T S P R I N K L E R P R S E
T F E C H E T G A M N F T E A E R O
T O G E O R N D E I E A Q R O R I S
T R N A N T L L R V N N L N T O A T
D R O U G H T N U E E F T T C U D T
N D Q U R C I O H A E E A R R T E R
R T O R H C I C N T D Q E L R T L H
N N P O T I J O D I R Q D E L R H T

AQUIFER

COTTON

DROUGHT

IRRIGATION

RAINFALL

RECHARGE

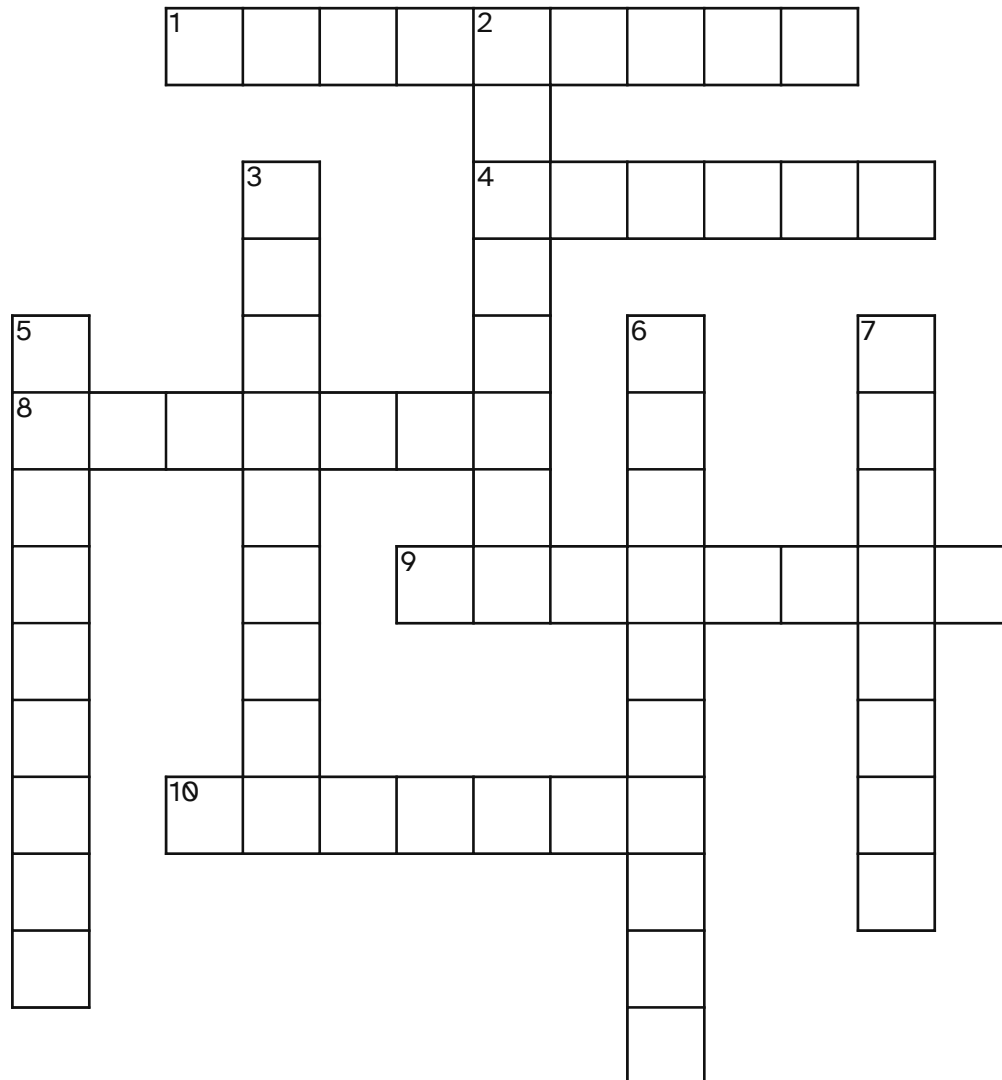
RESERVOIR

SATELLITE

SEDIMENT

SPRINKLER

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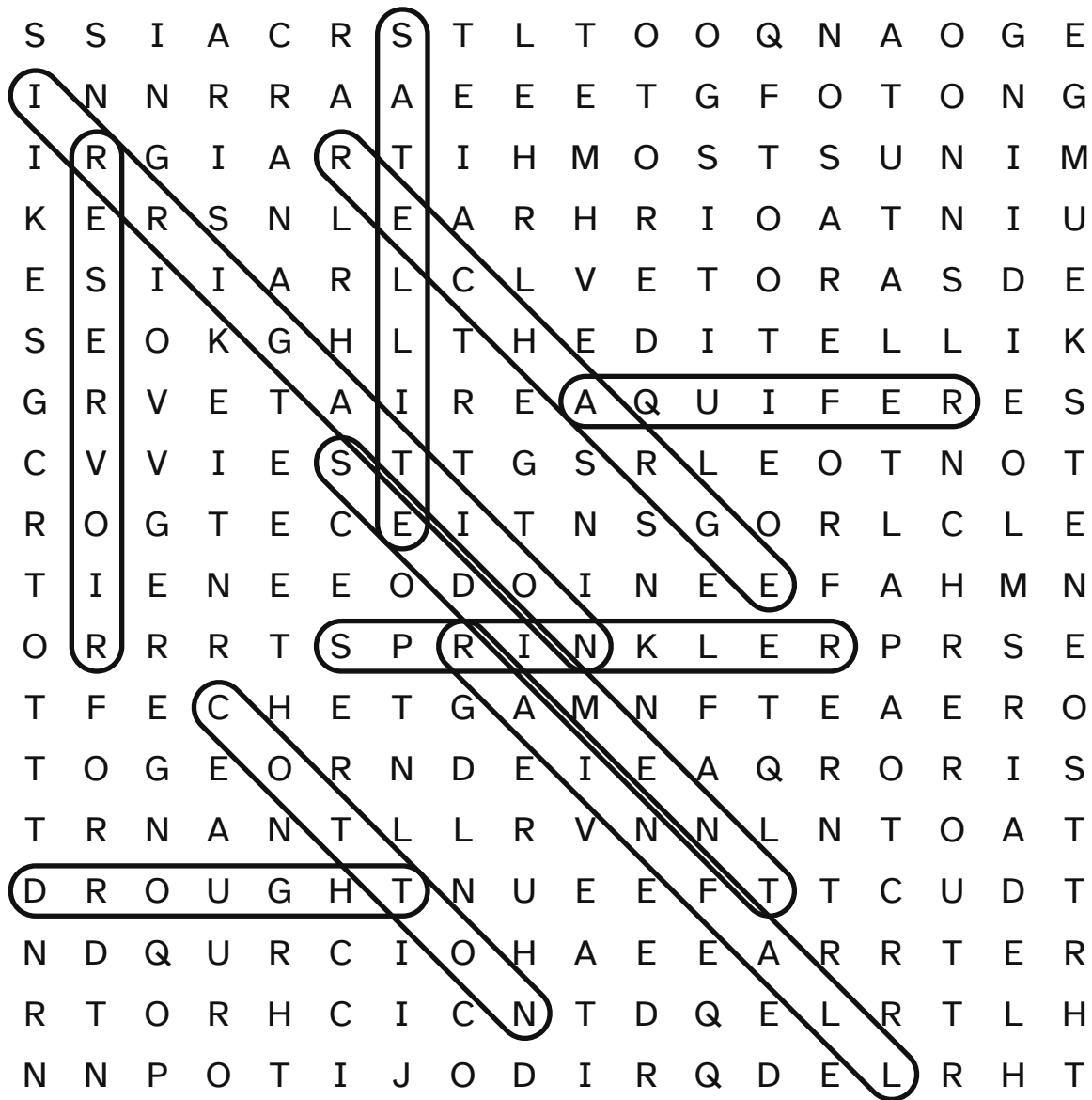
ACROSS

- 1 Place where water is collected for later use
- 4 Soft plant fiber used in cloth and everyday items
- 8 Underground rock or sediment layer that holds water
- 9 Tiny bits of rock, dirt, or other material moved by wind or water
- 10 Long spell with far less rain than usual

DOWN

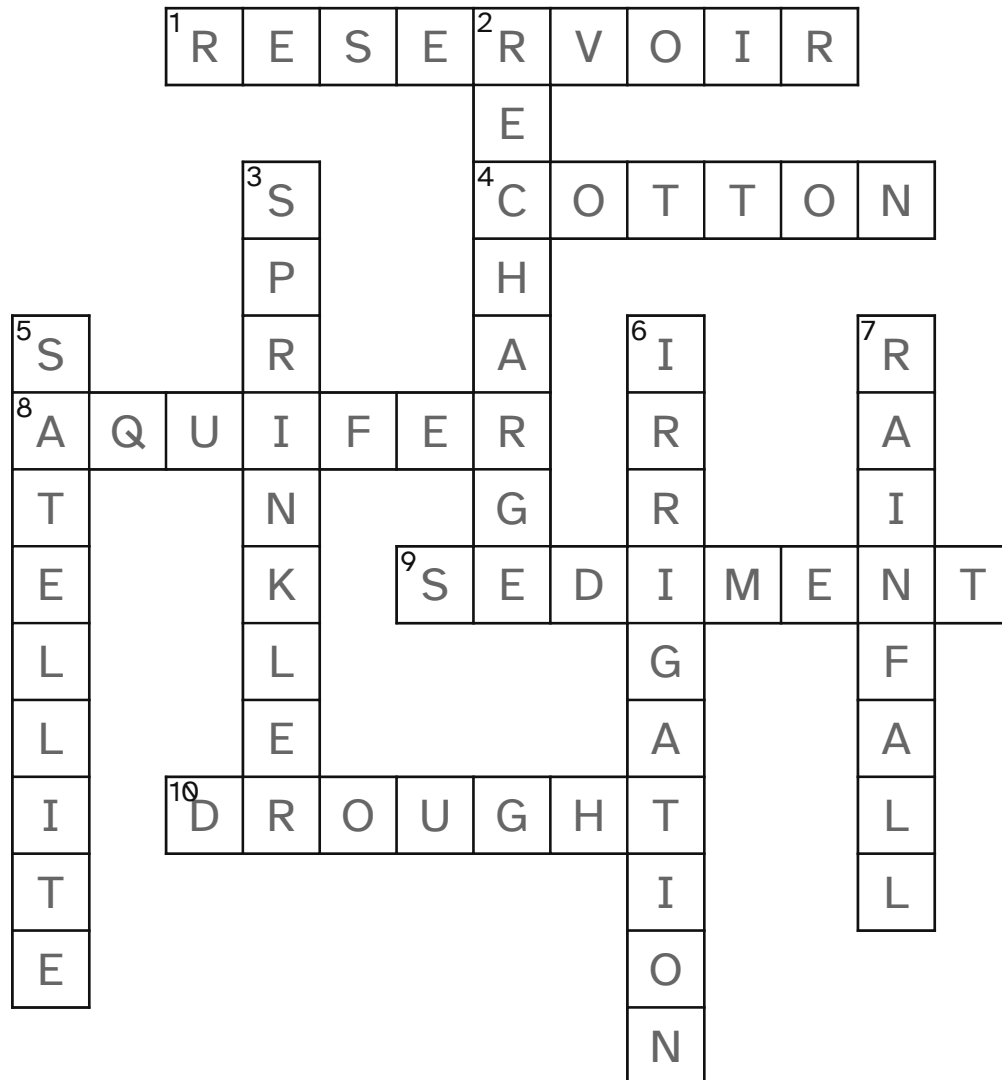
- 2 Natural refilling of an underground water supply
- 3 Device that sprays water over plants or land
- 5 Space object that collects images and information about Earth
- 6 Supplying fields with water when rain is not enough
- 7 Water falling from clouds

Texas Cotton Farmers Face a Water Problem Seen From Space — answer key



AQUIFER COTTON DROUGHT IRRIGATION RAINFALL
 RECHARGE RESERVOIR SATELLITE SEDIMENT SPRINKLER

Texas Cotton Farmers Face a Water Problem Seen From Space — answer key



ACROSS

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Where this came from

This article was written for 3andB from the reporting below. It is not a reprint — the wording is ours and the facts are theirs.

NASA

“Fighting Drought in Texas Cotton Country”

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<https://science.nasa.gov/earth/earth-observatory/fighting-drought-in-texas-cotton-country/>

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The article with a note on each question, a word search, a crossword, and the answer key to both.

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