

# US farmers fear the return of the Dust Bowl

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**For years the Ogallala Aquifer, the world's largest underground body of fresh water, has irrigated thousands of square miles of American farmland. Now it is running dry**



*The town of Happy, Texas, sits on top of the rapidly depleting Ogallala Aquifer. Its population is dwindling by 10 per cent a year. Photo: Misty Keasler*

There is not much to be happy about these days in Happy, Texas. Main Street is shuttered but for the Happy National Bank, slowly but inexorably disappearing into a High Plains wind that turns all to dust. The old Picture House, the cinema, has closed. Tumbleweed rolls into the still corners behind the grain elevators, soaring prairie cathedrals that spoke of prosperity before they were abandoned for lack of business.

Happy's problem is that it has run out of water for its farms. Its population, dropping 10 per cent a year, is down to 595. The name, which brings a smile for miles around and plays in faded paint on the fronts of every shuttered business ó Happy Grain Inc, Happy Game Room ó has become irony tinged with bitterness. It goes back to the cowboy days of the 19th century. A cattle drive north through the Texas Panhandle to the rail heads beyond had been running out of water, steers dying on the hoof, when its cowboys stumbled on a watering hole. They named the spot Happy Draw, for the water. Now Happy is the harbinger of a potential Dust Bowl unseen in America since the Great Depression.

'It was a booming town when I grew up,' Judy Shipman, who manages the bank, says. 'We had three restaurants, a grocery, a plumber, an electrician, a building contractor, a doctor. We had so much fun, growing up.' Like all the townsfolk, she knows why the fun has gone. 'It's

the decline in the water level,' she says. 'In the 1950s a lot of wells were drilled, and the water went down. Now you can't farm the land.'

Those wells were drilled into a geological phenomenon called the Ogallala Aquifer. It is an underground lake of pristine water formed between two and six million years ago, in the Pliocene age, when the tectonic shifts that pushed the Rocky Mountains skywards were still active. The water was trapped below the new surface crust that would become the semi-arid soil of the Plains, dry and dusty. It stretches all the way down the eastern slope of the Rockies from the badlands of South Dakota to the Texas Panhandle. It does not replenish.

Happy is the canary in the coalmine because the Ogallala is deepest in the north, as much as 300ft in the more fertile country of Nebraska and Kansas. In the south, through the panhandle and over the border to New Mexico, it is 50-100ft. And around Happy, 75 miles south of Amarillo, it is now 0-50ft. The farms have been handed over to the government's Conservation Reserve Programme (CRP) to lie fallow in exchange for grants: farmers' welfare, although they hate to think of it like that.

The first ranchers, and the Plains Indians before them, knew of water below the ground from the watering holes that sustained buffalo and then cattle far from any river. The white man learnt to drill, leaving primitive windmills on top of wooden derricks silhouetted against Wild West horizons.

But it was only in the 1940s, after the Dust Bowl (the result of a severe drought and excessive farming in the early 1930s), that the US Geological Survey worked out that the watering holes were clues to the Ogallala, now believed to be the world's largest body of fresh water. They were about to repeat the dreams of man from the days of Ancient Egypt and Judea to turn the desert green, only without the Nile or Jordan. With new technology the wells could reach the deepest water, and from the early 1950s the boom was on. Some of the descendants of Dust Bowl survivors became millionaire landowners.

'Since then,' says David Brauer of the US Agriculture Department agency, the Ogallala Research Service, 'we have drained enough water to half-fill Lake Erie of the Great Lakes.' Billions upon billions of gallons ó or, as they prefer to measure it, acre-feet of water, each one equivalent to a football field flooded a foot deep ó have been pumped. 'The problem,' he goes on, 'is that in a brief half-century we have drawn the Ogallala level down from an average of 240ft to about 80.'

Brauer's agency was set up in direct response to the Dust Bowl, with the brief of finding ways to make sure that the devastation never happens again. If it does, the impact on the world's food supply will be far greater. The irrigated Plains grow 20 per cent of American grain and corn (maize), and America's 'industrial' agriculture dominates international markets. A collapse of those markets would lead to starvation in Africa and anywhere else where a meal depends on cheap American exports. 'The Ogallala supply is going to run out and the Plains will become uneconomical to farm,' Brauer says. 'That is beyond reasonable argument. Our goal now is to engineer a soft landing. That's all we can do.'

Estimates vary, but with careful conservation, less wasteful irrigation and seeds for corn, cotton, wheat and sorghum genetically engineered for drought conditions, farming may yet go on for 60 years. That would be over the deepest stratum of the Ogallala. But the husbanding

of water, soil, minerals or anything else has never been the Texan way, and without it the dust will start blowing in as few as 10 years.

Water ó not oil ó has always been the most valuable resource in the West. Wars have been fought over it, feuds maintained, and fortunes won or lost. Apart from the Ogallala, the main source remains the Colorado River, flowing west from the Rockies, its annual bounty of snow melt providing the drinking water for Las Vegas, irrigation for California's Central Valley, and the swimming-pools of Los Angeles. No one is surprised that the mighty Colorado now runs dry before it reaches the Pacific, nor that climate change, with falling rain and snow levels, spells potential disaster for the Sunshine States. There are at least public controls over most of this water, even if it is actually owned by corporations and very rich people with 'water rights'.

But Texas, true to its self-conscious style of 'rugged individualism', has no such legal controls. It maintains its Wild West-era laws of 'right to capture'. This means that if you have water under your land, or in a river running through it, you can take and use as much of it as you like. You can water the corn or the cows, or you can make a buck by selling it to the nearest thirsty suburb. If you want to drain your land into desert, you may.

With the American 'can-do' faith in technology, Brauer's own hopes are for the 60-odd years of reduced but viable farming. 'We don't want it to be a bust,' he says. 'We have to be optimistic.'

In Happy, that sounds more like wishful thinking. The early December sun sinks towards the winter solstice at a few minutes after six, leaving Main and its crossroads with the railway tracks in darkness but for a few street lights. A miniature suburban-style housing grid stretches between Main and the high school on the eastern edge of town. The football team is the Happy Cowboys, their cheerleaders the Happy Cowgirls. Old pick-up trucks in the car-park denote an away match, their drivers piled into yellow school buses for the trip. Most of the houses are still lived in, valued at about half the Texas average. Some are dilapidated, their gardens planted with rusting detritus, others spruce with the Stars and Stripes flapping in the breeze. Nowadays, the working population drives an hour or so north or south to small cities where they find employment.

The temperature drops below freezing. Kay Horner sits in My Happy Place, her diner on Highway 87, hoping for traffic and customers. She has moved back from Arkansas, snapping-up a Main Street store for only \$10,000 to turn into her home. 'There used to be 50,000 head of cattle, now there's 1,000,' she says. 'Grazed them on wheat, but the feed lots took all the water so we can't grow wheat. Now the feed lots can't get local steers so they bring in cheap unwanted milking calves from California and turn them into burger if they can't make them veal. It doesn't make much sense. We're heading back to the Dust Bowl.'

Less than 20 miles south, towards Lubbock, the next town down Interstate 27, Barry Evans is still farming. His 2,200 acres came from his great-uncle Freeman, who watched it turn to dust in the 1930s. Evans's father, in his eighties, still works the farm next door. Evans has sunk new wells to make up supply as old ones dry from producing 1,000 gallons a minute to 100, but the aquifer is deeper here and they have enough Ogallala water left to pump and make a profit. They want to make it last, their eyes fixed on the future so that Barry's son, Eric, can take over for a fourth generation. He is in his last year at high school and is raising four pigs of his own for the 4H (young farmers) competition at the County Fair. It will not be easy, but

at 48 Evans has taken himself to the cutting edge of farm technique and technology. If there is a future for Ogallala farming, it depends on men such as Evans.

'You have to see this as a business like any other,' he says. 'To earn a living, to stay on the land, you have to maintain the margin between cost and product value. Our water level is 10 per cent of what it was 30 years ago, and we have to make up for that by technique. That means looking for more yield from less water.'

Evans went to the local university for an agriculture degree, and stayed on to complete half a master's in business. He does not own a cowboy hat, and pulls on a winter coat bearing the logo of a seed company, a salesman's gift, as he sets out to tour his 'sections', fields of a square mile each. At ground level the rows look faintly curved, but from the air you can see that the fields are circles, and from passenger jets at 30,000ft they look like the crop circles of Salisbury Plain. They are ugly and alien on the wide-open land, but they have become the landscape of Ogallala agriculture because they are cut to fit the sweep of the enormous arm of a pivot irrigator, turning like the hand of a clock, a hand a half a mile long. They cost \$180,000 each.

Evans stops by a well. There is no derrick, only a concrete block sprouting heavy pipes, because nowadays the pump is at the bottom of the well. Inside a steel box is a computer: it controls the pivoting arm to lay down an average of an inch in eight days. Every drop counts. On many farms you can see the effects of drought from the air as a quarter or a third of the land is left dry to burn brown in the sun. 'During the 90s, I really thought it would never rain again,' Evans says. 'But with a bit of luck, we get eight to 10 inches a year, and we have learnt to capture it. I aim for half-and-half, half rainfall and half aquifer.' He can now grow crops using five acre-inches a year, rather than acre-feet. 'That's a big difference,' he says.

He strides into the field along the line of the pivot arm, 12ft over his head. Every few yards a spray nozzle dangles on a hose, low enough to spray below the canopy of the crops. That is one way to minimize waste through evaporation. Next, he stoops to the soil to show the flattened stubble of last year's crop, and of the year's before that. He no longer ploughs ó nothing dries the surface to turn the soil to dust like ploughing. Instead, the old stalks hold down the soil, keep the moisture in, and rot down to nutrients. The seeds, themselves 'engineered', are dropped below the surface by a machine that opens a narrow channel in front of the dispenser, and closes it behind them.

Then there is the choice of crops. Evans has switched from corn, wheat and cattle to cotton and sorghum, which makes oil and ethanol for fuel, alternating them around his circular fields. They use less water, and he has got rid of the cattle altogether. 'I don't want to drill more wells,' he says. 'Why would I want to own a desert?'

At the Ogallala Research Service's experimental farm just west of Amarillo, soil scientist Steve Evett nods his approval and says, 'The smart, educated farmer survives: the ones that fall behind do not.' He is out in his half-sized 'pivot' field, showing off the next generation of irrigation systems. This one is fully automated and, with a bit of luck, may save another drop or two. It starts with a new nozzle, a 'sock', which drips the water right on to the ground by each root. Between each dangling pipe is a cable with a sensor at one end, and a computer relay at the other. It measures the amount of moisture in the canopy, and takes a light-spectrum scan of each plant to determine its health, just as the gardener judges the colour of

his leaves. This information goes back to the computer mounted at the well-head for even finer metering.

In another field, there is what might become the last resort: a system buried underground, watering only individual roots, with evaporation limited to any that might reach the surface. 'We are already seeing much less water used,' Evett says, 'and there is going to be less and less to use. Things will get harder and harder, but we can use technology to offset the drying for as long as we can.'

All may come to nought in the face of a threat that has nothing to do with corn or beef, but everything to do with the American devotion to making money at any cost. The Texas oil billionaire and corporate raider T Boone Pickens is after their water. He is proving to be the ultimate test of their free market gospel of the 'right to capture'.

Ten years ago Pickens concluded that the prophets of climate-change may well be right, and if they were, that water would become more valuable than the oil that had made his fortune. He formed a company called Mesa Water, and began buying up Panhandle land with water rights over the Ogallala. He is now the largest individual water owner in America, with rights over enough of the aquifer to drain an estimated 200,000 acre-feet a year, at least until the land goes dry. That is 65 billion gallons a year, or, to put it another way, 124,000 gallons a minute. The plan? Ninety-five per cent of Ogallala water is now used for agriculture, but Pickens plans to pipe it 250 miles to Dallas, expected to triple in size in 30 years, with a demand for water far exceeding supply. Pickens is making the hottest of climate-change bets: that water's value will rocket as it runs dry. One man's thirst is another man's fortune. Irrigation farming would simply follow gold mining, open-range ranching and oil drilling in the traditional cycle of boom and bust. 'There are people who will buy the water when they need it. And the people who have the water want to sell it,' Pickens has said. 'That's the blood, guts, and feathers of the thing.'

'Obviously it would be a disaster for the Panhandle,' Steve Walthour, manager of the North Plains Groundwater Conservation District, says. 'But if there are no limits, he can take all he wants. That's the law of capture.'

Texas conservatives, at the core of America's faith-and-business culture, root for Pickens. Brent Connett, a policy analyst for the Texas Conservative Coalition Research Institute, pushes the view that trading farming for selling water is a 'right' upheld by 100 years of Texan law, and can only bring new prosperity. 'The water business, if allowed to bloom,' he believes, 'can be the advent of another multi-billion-dollar business that will tremendously benefit all Texans, especially those who hold the rights to the water in the Panhandle.'

Connett does not offer a count of winners versus losers. But a group of landowners in the far north of the Panhandle could certainly be winners. Taking advantage of another quirk of Texas law, they have voted against joining Walthour's Conservation District. That was their democratic right even as it defied the attempts of their fellow farmers to protect water supplies for the benefit of all. The other Ogallala states all have some form of government controls metering water use. Texas has the Conservation Districts instead, with the local farmers voting their own restrictions. The problem is that these are voluntary. 'The idea,' Walthour says, 'is to balance individual water rights with the common interest. It's the best thing to do. Otherwise the biggest pump wins ó and everyone goes dry.'

Will Allen, among the 'opt-out' owners with a 'spread' close to the Oklahoma border, does not see it that way. 'In Kansas, the state owns the water ó not so in Texas,' he says. 'We own it, and we don't see why we should give up our right to capture. We would be giving away property that belongs to us.' His family settled here in 1905 and he holds to their belief that the aquifer is less of a lake than a series of 'pockets', private to the land immediately above. Only the prospect of Pickens draining the water from underneath him seems to dent Allen's stand-alone verities. Would he chase him out of town? He chuckles, a little uncertainly. 'Well, I wouldn't want him as a neighbour,' he says. 'But if he takes out water he owns, that is his right.'

There is an air of fatality hanging over the farmers of the Panhandle. At the Elk Junction Restaurant in Stratford, a crossroads village 70 miles north of Happy at the heart of the 'opt-out' district, a group of half a dozen farmers has gathered to gossip over pies and coffee. Most are retired, or planning to quit, handing over to their sons if they want the land. Not all do. These men are mostly losing the struggle for water and the slender margins of profit that can keep them on the land. They have worked long and hard through often brutal weather, farming vast tracts with a couple of sons until they quit for college or city jobs. The land they have hung on to is worth a pension, as long as there is still some water for irrigation, but their real reward is their pride. To a man they loathe Pickens, while defending his 'right to capture'. This is Texas, and they are Texan.

The water boards would like to stop him but they know that state government would not dare challenge individual rights to ownership. Their only real chance is to persuade the county authorities to stall on 'zoning' permits when he starts to build his pipeline, and that is an outside chance.

'The heart of the Dust Bowl was here, you know,' says Wayne Plunk, whose great-great-grandfather came over from Germany. He is big and round, strong as an ox in his day, but now he looks a good 10 years older than his 69 years. 'When I was six I was asking my dad for a \$1 umbrella against the sun for the tractor I drove all day. He said no, and bought me a 25-cent hat instead.' He has not stopped working since. He went to college to train as a teacher, and for 25 years taught at local schools while farming in the remaining hours. 'We are drying up. People don't learn from history, and if we keep breaking the ground and run out of water, it'll happen again.'

Plunk believes that one way or the other, farming the High Plains will have to end. Like the farmers of Happy, he has handed his land to the CRP to let it return to the Plains that nature intended. He misses the life. 'I used to go out on the land before dawn when I worked at school,' he says, 'and I would always plough to the east. I ploughed into the rising sun, and I knew there was a God.' He pushes back his cap, and stares into the distance.