

Alarm as almond farms consume California's water

Extreme drought and soaring global demand is threatening supplies of one of the world's favourite snacks



An almond orchard in Los Banos, California, is affected by extreme drought. Photograph: Justin Sullivan/Getty Images

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Touted as the ultimate superfood and an essential ingredient in everything from mezze to marzipan: the humble almond has never been so popular. But with prices at a nine-year high, almonds are in the frontline of a battle over water as California struggles to cope with one of its worst-ever droughts - stoking fears of an almond shortage over Christmas.

Californian farmers, estimated to grow around 80% of the world's almonds, have been accused of siphoning off groundwater at the expense of the state's future water reserves.

As rivers and lakes have dried up, with more than 80% of the state in the grip of "extreme" or "exceptional" drought, the state's farmers have resorted to pumping groundwater - underground reserves - to nourish almond trees, vineyards and orchards. David Zetland, economics professor at Leiden University College in the Netherlands, says farmers are

pumping water at a rate four to five times greater than can be replenished: "The people of the state of California are more or less destroying themselves in order to give cheap almonds to the world."

Although California produces even more milk and grapes than almonds, the spotlight has turned on the \$4.3bn (£2.65bn) almond crop, following a rapid expansion in planting. Almost a million acres of California's central valleys have been planted with almond trees - a twofold increase since 1996.

The world's appetite for the nut - which botanists actually classify as a seed - apparently knows no bounds, with scores of academic studies extolling its ability to lower cholesterol, sate the appetite and improve the skin. In the US, almonds have overtaken peanuts as the country's favourite snack, while almond milk has overtaken soy, as milk from cows continues to fall out of favour.

In the UK, sales of almonds increased by 45% over 2012-13 after a marketing blitz in lifestyle magazines. In China, where the nuts were initially marketed as "big American apricot kernels" - a fruit with lucky connotations - demand has grown by 110% since 2008, although sales dipped last year after the name of the product was changed.

California has emerged as the world's almond orchard because it is blessed with near-perfect conditions found in few regions of the world: brief cold winters that chill the seed to accelerate its flowering (vernalisation), early warm springs and long dry summers. David Doll, crop adviser for Merced County at the University of California, says the state may be approaching peak production for almonds. "The future for farming almonds in California will always be there," he says, pointing out almonds are more tolerant to drought than other crops. "It is more about coming into balance with our water resources."

But nearly two thirds of farmers with large almond holdings recently said they expect to pump more groundwater this year than last. A recent report from the University of California found that farmers had spent an extra \$500m in pumping extra water to cope with the drought, while the total cost to the state reached \$2.2bn.

However, Richard Howitt, a co-author of the study, cautions against singling out particular crops: "Don't blame almonds for the problem. The problem is one of water mismanagement." He wants to see sweeping changes in how California manages water, so farmers monitor their use of groundwater and replenish supplies when rain is more plentiful.

"[The farmers] should be repaying what they are taking. And if they are taking more, as they always are in droughts, then they should be making plans to repay it back in the wet years," he says. "If you treat your groundwater the way you treat your retirement account, then everything would be OK."

A spokesperson for the Almond Board of California says almond producers are using water more efficiently than ever before. "California almond growers are proud leaders in agriculture water efficiency, using 33% less water per pound of almond produced as compared to 20 years ago."

The US department of agriculture is forecasting a record 952bn kg crop. But when the

harvest ends in late October, most experts think the crop will be smaller, as that estimate - based on a survey of 890 orchards - was made before the drought's severity was clear.

With the drought forecast to drag on into 2015, many growers are unwilling to sell this year's crop, sending prices soaring.

Growers want to conserve stocks, because they fear the damage to next year's crop will be even worse. "Most farmers have been able to get by this year because they have begged or borrowed water," says Doll. "If we have another year of drought we will probably start to experience problems." And if the drought goes into 2016, "the impacts would be devastating".

The price of Californian almonds has climbed by 10% over the last six to eight weeks to \$10,500 a tonne, according to Giles Hacking, a London-based trader and vice president of the International Tree Nut Council.

"The prices are rising because concerns about crop size are bringing more buyers to market, but suppliers are holding back from sales. It has the effect of squeezing prices," he says.

Sanjoy Das, founder of Freeworld Trading in Edinburgh, says trade is at a standstill. "These are record high prices. The result will be very expensive [almonds] and a lack of almonds for the Christmas market."

Zetland says higher prices should be welcomed, if combined with tighter regulation of California's water management. He dismisses the idea that consumers should steer clear of Californian almonds, arguing that the only way to curb "unsustainable" supplies would be even higher prices.

"The problem is that California, because of its failed institutions for managing water, is allowing these almonds to come on market at \$3-\$4 a pound wholesale, when the price would be tripled if California was managing its water sustainably and farmers faced the real cost of water."

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