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Challenges Ahead for California Pima Cotton

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Key Points:

- Pima cotton is a premium cotton used in high-end clothing and bedding which is grown primarily in California.
- Cotton acreage suffered during recent droughts in California, and the combination of prolonged and more frequent droughts along with additional regulation on water use in the state will challenge the crop in the future.
- Acreage under long-term water reductions or cost increases could shift to permanent crops like tree nuts and grapes which use similar amounts of water but yield higher returns.
- Reduced Pima cotton acreage in the U.S. will result in lost market share to other long staple cotton exporters like Egypt and Peru.
- U.S. gins and premium textile supply chains, and dairy farmers who use cotton seed in their feed, will be stressed by higher costs.

Introduction

American Pima cotton is an extra-long staple cotton grown primarily in California. It is used as an input in premium textiles that are often manufactured abroad and ultimately shipped back to the U.S. in the form of high-end clothing and bedding. Pima cotton growers earn a premium price compared to short-staple varieties like upland cotton, which makes up the vast majority of cotton grown in the U.S.

Cotton growers in California have the distinct advantage of a favorable growing climate for Pima cotton, but they face challenges around water availability. An extended drought impacted acreage for multiple years between 2012 and 2017, and anticipated regulations in the works are expected to further limit water availability in the years ahead. While the majority of cotton across the U.S. cotton belt is grown under non-irrigated conditions, cotton in the West, including Pima cotton typically relies on irrigation.¹

In the face of continued water use limitations, some growers will opt to switch from cotton to other crops including permanent crops like tree nuts and grapes. The decline in local production will raise costs on gins that will increasingly rely on imports. California dairy farms will also see higher feed costs from shipping cottonseed from farther distances.



Pima Cotton Background

Pima cotton is a variety of cotton grown primarily in California, with small amounts also grown in Arizona, New Mexico and Texas. The vast majority of cotton grown in the United States is a short staple variety known as American upland cotton with fibers that range from 7/8 inch to 1 5/16 inches. American Pima Cotton meanwhile, falls into the category of extra-long staple cotton, with fibers ranging from 1 1/4 inches to 1 9/16 inches.

Compared to upland cotton, Pima cotton has a lower yield, but commands a price premium which has averaged 59 cents per pound over the past five years. (See Exhibit 1.) The price premium is possible thanks to the desirability of the longer fibers in high-end consumer goods. The longer fibers make pima cotton preferable for premium textiles and fabrics used for bedding and high-end clothing at retailers like Brooks Brothers and Banana Republic.

Cotton acreage in California peaked in 1979 with 1.6 million acres harvested, though at the time it was almost exclusively upland cotton. During the 1990s, acreage decreased dramatically due to higher water costs and lower availability. At the same time, Pima cotton acreage increased in response to the higher price. Since the late 1990s, Pima harvested acres have remained in the range of 200,000 acres, while upland acres dropped to 47,000 in 2018. (See Exhibit 2.)

Water Limitations

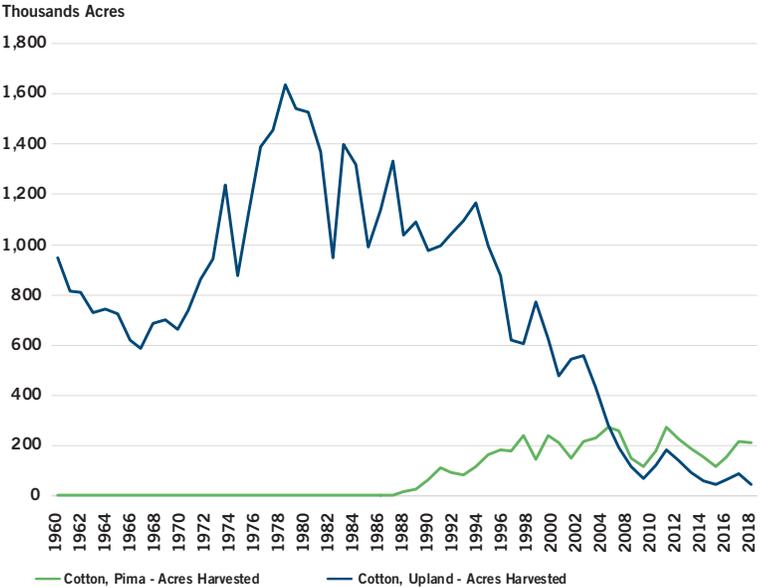
Pima cotton requires 2.5 to 3 acre-feet of water, which is in line with many of the other crops grown in California. For comparison, vegetables average around 2.8 acre-feet, land in orchards average 2.7 and on the upper end of water use is rice, requiring about 4.5 acre-feet of water.²

EXHIBIT 1: Pima vs. Upland Price Premium



Source: USDA

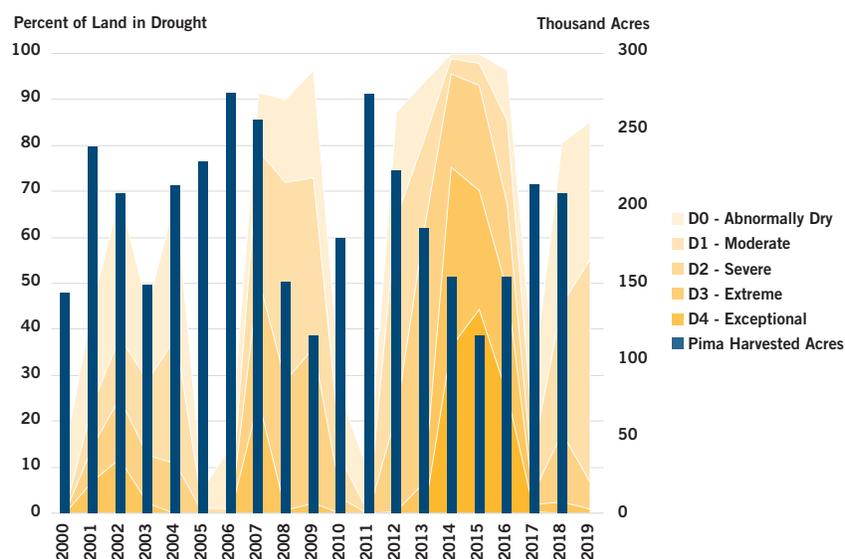
EXHIBIT 2: Pima vs. Upland Cotton Acreage in California



Source: USDA - NASS

Cotton acreage in California dropped in response to water shortages. Harvested acreage decreased dramatically during prolonged droughts since 2000, which have provided a useful natural experiment in observing the sensitivity of the crop to water shortage. Acreage dropped

EXHIBIT 3: California Acreage and Drought Severity



Source: USDA - NASS, U.S. Drought Monitor

by about 38 percent during a drought between 2001 and 2003, and dropped by 58 percent in two later droughts from 2006 to 2009 and 2011 to 2015. (See Exhibit 3.)

In response to long-term water management concerns, three bills were introduced in 2014 and collectively became known as the Sustainable Groundwater Management Act. By 2020, plans will need to be in place to regionally manage and regulate water usage to reduce ground-water use to sustainable levels by 2040. While many of the details of how these regulations will be implemented are still unknown, they will begin having an impact on the agricultural sector of California within the next few years.

Choices Facing Farmers

If water costs increase or availability decreases, cotton acreage is sure to decrease. The incentive to switch from cotton to another crop is not a matter of reduced water use. Rather, it is a matter of the profit margin earned per unit of water. Other options, like permanent crops and canning tomatoes may use similar amounts of water but return higher levels of profit.

The decision to switch to alternative crops is not always as simple as planting different seeds. Many of the specialty crops grown in California, particularly permanent tree nut crops and grapes require very different management, labor requirements and equipment. While a drought for a limited time may present incentives to switch to other row crops or fallow a field temporarily, a long-term regulatory change could shift incentives toward bigger long-term investment in nuts or grapes.

Direct and Indirect Impacts

California's harvested cotton acreage decreased by 60 percent during the two most recent droughts there. While a drought is a physical limitation on water availability, a regulatory limitation can be expected to have similar results. If buyers of Pima cotton find themselves unable to source raw cotton, they will need to either pay more to return a high enough premium for growers to justify continuing to grow the crop, or they will need to source alternative cottons. This could include other long staple cottons from Egypt or Peru or it could lead to a shift toward incorporating synthetic fabrics.

If the number of gins is reduced due to lower production, the remaining cotton producers will likely face lower returns in the form of higher transportation costs to the gins that remain. The higher transportation costs could further strain growers and perpetuate additional acreage losses.

The byproduct of cotton fiber is the cottonseed which is removed during the ginning process and makes its way, most commonly, into the feed ration of dairy cows. As a result, a decrease in the availability of cottonseed will have spillover effects into the costs faced by California dairy farmers if they need to ship in cottonseed from farther away states like Texas.

Outlook

The impact of more restrictive regulations on water use or higher cost will likely result in a sharp decrease in Pima cotton acreage in California. Acreage during recent severe droughts has dropped to below 120,000 acres, and rebounded once water returned. Much of the cotton acreage in the future will switch to other crops which use similar amounts of water but provide higher returns per unit of water.

While during limited periods of drought, fields may be fallowed or temporarily switched to vegetables, the prospect of long-term water availability changes will result in a longer-term recalculation. This could cause investments to shift to permanent crops and a sustained decrease in cotton acres.

Primary effects of this reduced acreage will be a strain on gins in the region and a loss of market share to other producers of extra-long staple cotton including Egypt and Peru. Secondary effects from reduced acreage will

spread throughout the supply chain. Buyers of Pima cotton, and the textiles it is woven into may begin to source long staple cottons from other regions, and the U.S. Pima industry could lose substantial market share to competitors as well as face substitution from synthetics. ■

References

¹Cotton Incorporated. n.d. "Why Irrigate Cotton." Accessed February 19, 2019. <https://www.cottoninc.com/cotton-production/ag-resources/irrigation-management/why-irrigate-cotton/>.

²Johnson, Renée, and Betsy A Cody. 2015. California Agricultural Production and Irrigated Water Use. Congressional Research Service.

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