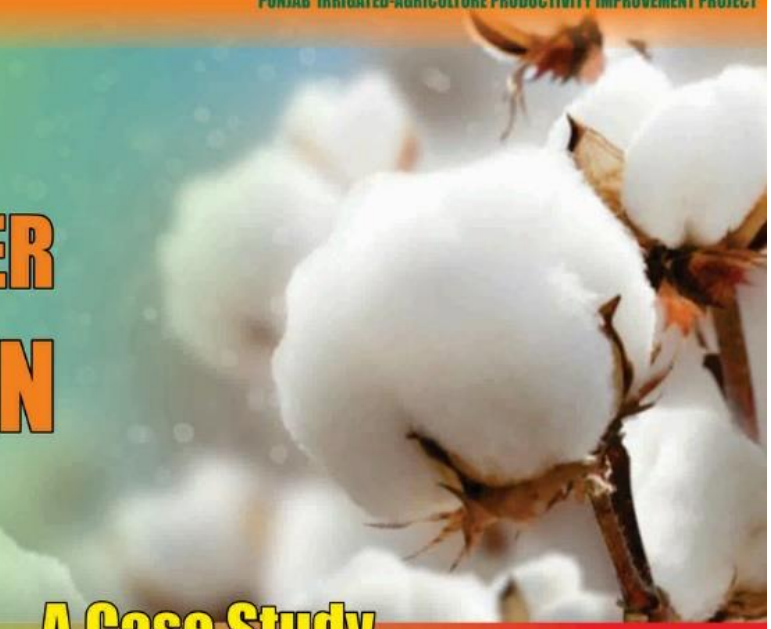
GOVERNMENT OF THE PUNJAB
Agriculture Department

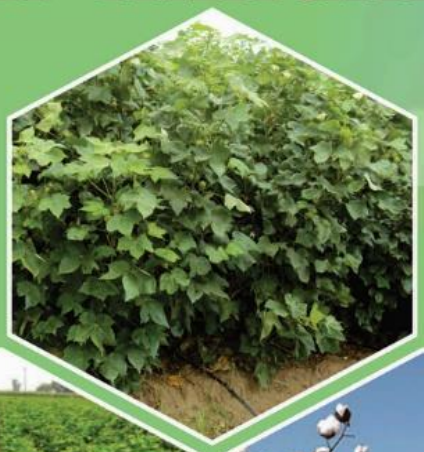
OFWM+
PIPIP
PUNJAB IRRIGATED-AGRICULTURE PRODUCTIVITY IMPROVEMENT PROJECT

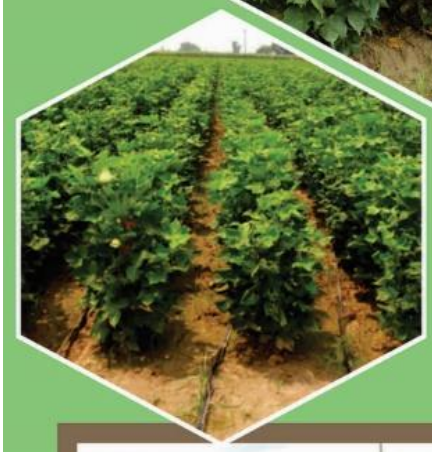
MORE OUTPUT WITH LESS INPUT

COTTON UNDER DRIP IRRIGATION



A Case Study





BENEFITS

- WATER SAVING BY 50%
- REDUCTION IN FERTILIZER USE UPTO 45%
- REDUCTION IN PRODUCTION COST UPTO 35%
- YIELD INCREASED BY MORE THAN 100%
- EARLY MATURITY OF CROP
- BETTER PRODUCE QUALITY
- CROP DIVERSIFICATION
- HIGHLY SUITABLE FOR UNEVEN TOPOGRAPHY

Directorate General Agriculture
(Water Management) Punjab, Lahore
Web: www.ofwm.agripunjab.gov.pk E.mail: pipipwm@gmail.com

OFWM
PIPIP
PUNJAB IRRIGATED-AGRICULTURE PRODUCTIVITY IMPROVEMENT PROJECT

COTTON UNDER DRIP IRRIGATION

A Case Study

Cotton known as "white gold" is one of the precious crops grown almost all over the world. The Pakistan globally ranks 4th in cotton production after China, India, and Unites States. Pakistan's cotton production accounts for 1.5 percent of GDP and 7.1 percent in agriculture value addition. About two thirds of the country's export earnings are from the cotton made-ups and textiles, while hundreds of ginning factories and textile mills heavily depend upon cotton.

The Punjab is major cotton producing (more than 80 percent) province with an area of about 6.3 million acres (2.5 million hectares) under its cultivation. During last few years, Pakistani cotton growers are facing several challenges including low prices, high input costs, water scarcity, changing climate etc. Local prices are controlled by international market and as such are out of farmers' control. The grower can only offset this effect by producing more from each unit of input i.e. water, fertilizer, pesticide, energy, labor etc. Adoption of modern cultivation techniques and technologies are way the forward in this regard. Drip irrigation is one such technology that has successfully been used worldwide for significantly reducing input costs (water, fertilizer) and substantially increasing crop yield including cotton.

The drip irrigation technology is being introduced in Pakistan's Punjab under the World Bank funded "Punjab Irrigated-agriculture Productivity Improvement Project (PIPIP)" on a large scale. So far, drip systems have been installed on about 25,000 acres (10,000 hectares) for cultivation of different crops (orchards, vegetables, row crops) all over the province including cotton. The significant impacts of drip technology are water saving, reduction in fertilizer use, lesser application of pesticides & weedicides and increased crop yields.

Five farms located in Toba Tek Singh and Khanewal districts have been studied to assess the impact on cotton cultivation under drip irrigation in comparison with the conventional irrigation techniques.

The analysis of the data revealed that cotton cultivation under drip system saved about 33 percent of water and reduced fertilizer & pesticide/weedicide use upto 41 & 20 percent, respectively against conventional irrigation methods of cotton cultivation. Moreover, per acre crop yield was 32 percent higher under drip irrigated/fertigated cotton as compared to traditional irrigation (**Table-1**).

DRIP IRRIGATION	
Water Saving	33 %
Reduction in Fertilizer Use	41 %
Increase in Yield	32 %

More specifically, at Wajid Ali farm in T.T. Singh about 63 percent saving in fertilizer was attained whereas as much as 61 percent increase in yield was obtained at Baber Sultan farm of the same district.

Contrary to conventional practices, drip

DRIP IRRIGATION SUCCESS STORY

OFWM PIPIP
PUNJAB IRRIGATED-AGRICULTURE PRODUCTIVITY IMPROVEMENT PROJECT

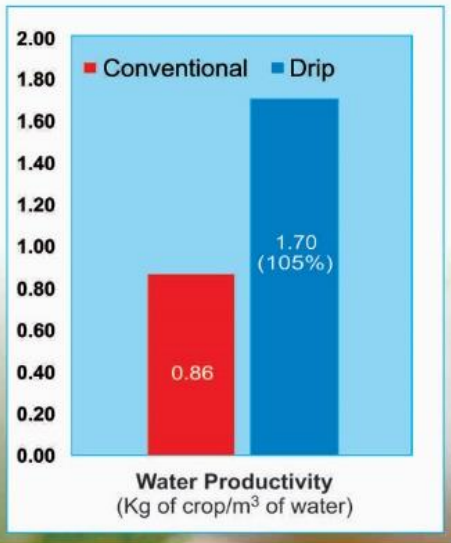
Table-1: Impact of Drip Irrigation System on Cotton Cultivation

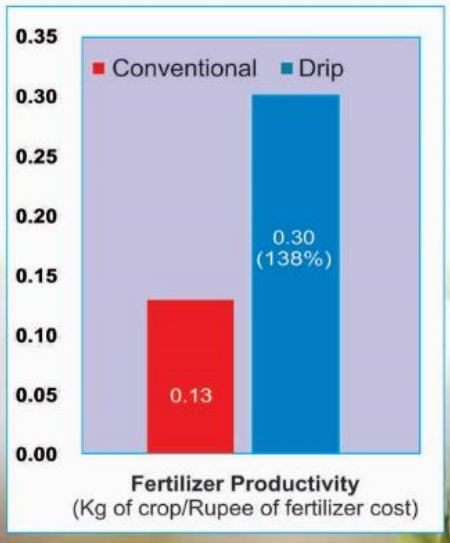
Sr.#	District	Farm	Drip Irrigation Technology Benefits against Conventional Method (%)				
			Input Reduction				Increase in Yield
			Water	Irrigation Cost	Fertilizer	Pesticides/ Wedicide	
1	T.T.Singh	Baber Sultan	37	29	33	22	61
2		Wajid Ali	36	41	63	20	43
3		Muhammad Arshad	47	22	29	13	34
4	Khanewal	Yousaf Jamil	25	17	33	25	10
5		Aslam Jamil	22	17	44	18	12
Average			**33**	**25**	**41**	**20**	**32**

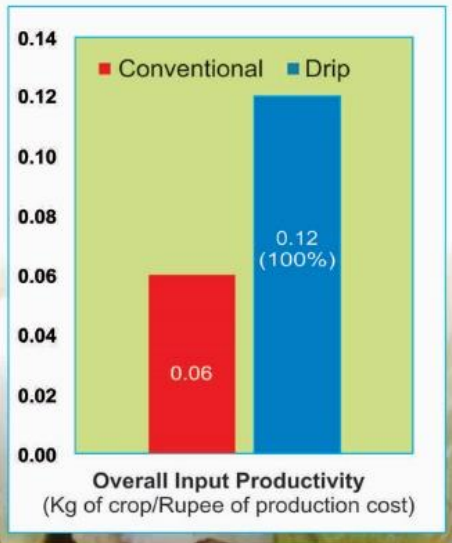
technology allows the user to provide required amounts of irrigation water to the crop and also enables fertilizer applications in exact dosages accordingly to crop growth stage with efficiency upto 90 percent.

Further analysis of data exhibited substantial (more than 100%) increase in water, fertilizer, and capital productivity under drip irrigated cotton in comparison with the conventional irrigation methods. Water productivity (kg of crop /m^3 of water) was 105 percent higher under drip irrigation with maximum of 156 percent at Baber Sultan farm. Likewise, there was 280 percent increase in fertilizer productivity (Kg of crop/Rupee of fertilizer cost) under drip fertigation against traditional fertilizer application at Wajid Ali farm with average increase of 138 percent at all five sites. The overall input productivity (Kg of crop/Rupee of production cost) has also been worked out, which was 100 percent higher under drip farming as compared to conventional cotton cultivation.

The key difference in drip irrigated cotton over the conventional method was better input management as drip system enables efficient, uniform, and timely application of water and balanced nutrition, which offers more conducive environment for plant growth. Overall, the growers have shown satisfaction on performance of drip system and acknowledged that it provided them an opportunity not only to reduce the production costs but also to increase the cotton yield.







Web: www.ofwm.agripunjab.gov.pk E.mail: pipipwm@gmail.com