Cotton

Inside: Learn how drip irrigation is providing solutions for.....

- Increasing crop yields
- Improving water use efficiency
- Optimizing input costs
- Controlling variability
A solution for increasing **crop yields**...

As a cotton grower, the key factors which drive your productivity are nutrients, disease and insect control and **water**.

Are you looking to improve yields from 2.5 bales/acre to 4 bales/acre or more? If so, you need an irrigation system that can precisely match your crops demand and optimize potential. When irrigated correctly, your crop can efficiently utilize water and nutrients to achieve better results.

Drip irrigation has many benefits including efficient use of water, reduction in the potential yield loss due to boll rot, and less weed competition by better control and placement of water. These and other benefits combine to produce a more uniform and higher quality cotton crop.

*DYields and quality are dependent on many variables and results may vary.*
A solution for increasing crop yields (continued)...

Case Reference 1 – Arizona Cotton Study

A 2001 study compared subsurface drip irrigation (high irrigation efficiency) with conventionally-furrow irrigated (with low irrigation efficiency in this study) cotton: Regular measurements included soil moisture, flower tagging, general plant growth and development measurements, and lint yield. Results indicate that an increase in lint yield of approximately 250 pounds lint/acre was obtained using around 1/3 less irrigation water with the drip irrigation system. Pounds of lint produced provided the most dramatic results. The differences are realized by improving the crop water demands with appropriate irrigation management.

The chart to the right shows that the fruit retention levels for the drip irrigated field were consistently higher over the growing season due to improved soil-plant-water relations with a more efficient irrigation management.


Case Reference 2 – Cotton Lint Yields in Texas

Three separate trials were conducted in Texas demonstrating the variations in cotton lint yield comparing sprinkler and subsurface drip irrigation. This study demonstrated that irrigated productivity is up to 24% higher in subsurface drip irrigation. These results numerically demonstrate the ability of a subsurface drip system to increase pounds/acre of lint when the water is delivered to the cotton plants’ effective root zone increasing transpiration and simultaneously reducing evaporation losses.

A solution for increasing crop yields (continued)...

Case Reference 3 – Arkansas Study

Drip irrigation has an effect on each growth stage of a crop. From early plant growth to fruit retention, each stage presents an opportunity to optimize total yield. In a recent study evaluating drip irrigation in Arkansas, researchers found that drip irrigation produced 40% to 65% yield increases over dryland and furrow irrigation.

Studies have shown that utilization of drip irrigation results in improved water use efficiency. Water use efficiency (WUE) is defined as a measurement of the water used for each unit of crop produced.

In the chart to the right, a study shows that the drip irrigated fields (optimally managed to match crop-water demand) achieved between 70-80 lint yield produced per acre-inch of water.


Results may vary based on variety.
A solution to optimizing input costs...

Drip irrigation systems play an important role in reducing other input costs associated with growing cotton. Utilizing a drip irrigation system can reduce:

- **In-season cultivation** - furrow making, weeding (weed pressure) and other labor intensive farm practices
- **Pumping costs** (due to lower pumping requirements)
- **Labor costs** (from increased automation)
- **Losses of chemicals and fertilizers** (fertigation) due to inefficiencies
- **Pesticide costs**

The chart to the right shows prices of the selected fertilizers rising. With the help of drip irrigation, there is an opportunity to increase the efficiency of fertilizer applications.

**Benefits of Drip Fertigation:**

1. **Minimize nitrogen volatilization.** When urea is converted into a gas and lost to the atmosphere, volatilization takes place. Using a drip fertigation system allows nitrogen to be applied directly into the soil solution close to the plants roots. This significantly increases the chance of nutrient uptake, minimizing volatilization.

2. **Minimize nitrogen loss.** Drip fertigation is a very efficient process where a greater percentage of the applied nutrients are utilized.

3. **Reduce number of tractor passes.** With the option to apply nutrients through the drip line not only do you reduce labor and fuel requirements, you also help reduce total soil compaction.

4. **Increased uniformity of fertilizer delivery.** Fertilizers can now be distributed to your total wetted area across the entire field with high uniformity.

5. **Allows in season application of P & K fertilizers.** Application via fertigation has an increased efficiency, since these elements are precisely placed in the plant root zone. Drip irrigation optimizes uptake.
A solution to controlling variability...

Drip irrigation offers a solution to manage your crops requirements

Precise Water Application

Irrigating under a flood regime typically involves irrigating every 10 days, where plants are inundated with water, then left to dry out. This method of irrigating produces alternative periods of high and low vegetative growth. Drip operates effectively by applying small volumes of water more frequently. This process optimizes the correct plant stress levels to ultimately produce plants with a higher boll density than can be achieved via flood irrigation.

Uniform Distribution of Water

No other irrigation technique can provide the same level of distribution uniformity (DU) that drip can. Drip irrigation systems can provide a distribution uniformity of 93% and higher. The higher the uniformity the lower the variability.

Control Points (drip irrigation)

1. Reduce uncertainties associated with variable rainfall patterns
2. Increase field access
3. Improve crop uniformity
4. Control plant stress
5. Reduce weed pressure
6. Maintain consistent soil moisture
7. Apply macro and micro nutrients in all stages of the crop (spoon feed the plant)

Your total irrigation solution...

We know how to develop a solution that meets your unique needs. Whether you have cracking clays or sandy loams, water from wells or rivers, John Deere Water can customize an irrigation system optimized to your requirements.

Whether you are an experienced drip irrigation operator or starting from scratch, there is a John Deere Water solution that you can rely on to provide long-term irrigation performance in all your cotton fields.

With 14 manufacturing locations worldwide, providing irrigation solutions in over 100 countries, John Deere Water is one of the world’s largest and most innovative irrigation companies.

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