# Pasture Irrigation is Cost Effective

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Interest in irrigating rotationally grazed pastures is increasing in the region. To date, little work has been done to investigate the costs and benefits in these systems. The following describes an irrigation project conducted in Adams County, WI.

The Central Sands area of Wisconsin gets its name from the fact the soil type is a sandy loam with an organic matter content of 1-1.5%. This soil type has very low water holding capacity, and the low organic matter limits the nutrients available to growing plants. With an average rainfall in the growing season of 21", it would be nice if this all came in an orderly fashion. Unfortunately, serious droughts during the growing season lasting 40-50 days have been experienced which have reduced the production per acre in improved grass/legume pasture to 4-4.5 tons of DM/ac.

**Table 1.** *Summary of forage yields 2006 and 2007.*

| Year | Beef Irrigated | Beef Dry Land | Dairy Irrigated | Dairy Dry Land | Growing Season |
|---|---|---|---|---|---|
| | *----------Tons DM/ac----------* | | | | *Rainfall* |
| 2006 | 8.45 | 4.60 | 7.32 | 4.55 | 18* |
| 2007 | 9.30 | 4.84 | 7.89 | 4.66 | 14 |

**4.4" occured over a 3-day event in late-June.*

**Table 2.** *Value of forage increase.*

| Year | $ Value of Increased Forage Beef Operation | $ Value of Increased Forage Hay Operation |
|---|---|---|
| 2006 | $462 | $332 |
| 2007 | $535 | $387 |

In Adams County, one beef cow-calf operation and one dairy farm implemented center pivot irrigation to increase the amount of high quality forage available to cows. One question that needed to be answered was *'what is the yield advantage of irrigated vs. non-irrigated pastures?'* These farms were willing to allow comparisons to be done over a 2-year period in 2006 and 2007.

Eight sites in each 60-acre center pivot were selected at random for forage sampling. Four of these sites were for irrigated pasture and four were for non-irrigated sites. The non-irrigated sites were developed by making a 110 $ft^2$ area by forming a circle using two 16 ft cattle panels. These were secured with four steel posts, and heavy duty canvas was applied prior to the irrigation system being turned on to ensure this area did not receive irrigated water. In each circle, 10 $ft^2$ was harvested five times annually over a 2 year period.

**RESULTS**

The cow-calf operation was irrigated weekly to ensure the grass/legume pasture received 1.5" of water from a combination of rainfall and irrigating water. The forage mix was a combination of alfalfa, red clover, white clover, tall fescue, and orchardgrass. The dairy operation was irrigated weekly to ensure the grass/legume pasture received .75" of water from a combination of irrigated water and rainfall. The dairy farm forage mix was a combination of perennial ryegrass, orchardgrass, alfalfa, and white clover.

The yield response was positive, adding almost 3-4 tons of forage/ac. Each area sampled had the same fertilization and harvesting time. The only difference was the amount of water available to plants. If a value of $120/ton is put on the value of harvested forage, values of $332-$535 over dry land pastures were seen (Table 2).

The increased production from irrigation makes it cost effective for most producers to consider, especially in areas with high land prices or areas where expansion land is not available to rent or purchase. Typical costs for a center pivot area are $30,000 for drilling a 12" well (watering 240 acres), and an irrigation system costing around $450/ac. Electricity or fuel charges will normally cost $4-5/in. of water applied. If it is estimated with an equipment useful life of 25 years and 20 years on the well, the cost/ac of applying 1" of water is ~$17-$20/ac to cover all costs. If 8" of water is applied in a growing season the cost is $160/ac. If yield is increased by 1.33 ton/ac, costs will be at a breakeven level.