

Comparing Drip and Pivots

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VALLEY 

The Leader in Precision Irrigation

You Can't Afford Not to Use Pivot Irrigation.

In recent years, two effective and efficient irrigation methods have emerged as the leading technologies — drip and center pivots. People now associate distinct advantages and disadvantages with each. Some of these are true. Some are myths. So how do you make a decision between the two? You compare the facts. There are at least five important areas where you should pay special attention:

- annual return on investment
- initial investment costs
- labor costs
- water efficiency
- crop versatility

After fully analyzing these issues, you'll find that pivot irrigation is clearly the most advantageous in the majority of situations. And when it comes to center pivots, you won't find better products than those from Valley®.

Pivot installations and drip systems both have benefits. But in most cases, financial analysis shows center pivots to be the logical choice for large-scale commercial agriculture. Simply put, if your crops benefit from pivot irrigation, so will your bottom line. Just look at the comparison in return on assets. It doesn't take an accountant to see the advantages of center pivot irrigation equipment.

To help save your freshwater supply, center pivots are often used for controlled application of wastewater and nutrients on forage and grain crops. Because Valley pivots can handle solids, advanced filtration isn't necessary. Applying wastewater through drip irrigation is much more complicated. Different tape with larger emitters and more filtration are needed, and plugging occurs much more frequently.



Center Pivots Cost Less, Last Longer, and Retain Their Value.

When it comes to initial investment costs, center pivots are much less expensive than their drip irrigation counterparts. Center pivot irrigation equipment typically costs between \$800 and \$1,200 per hectare. Drip systems cost between 20% to 100% more.

Pivots also last twice as long — 25-plus years for center pivots compared to a typical 10-15 years for drip systems. And even after 15 years, Valley pivots retain 50% of their value for resale. Drip systems? After removing the tape, you probably have to pay someone to take it away.

Return on Investment

	Pivot	Drip
Crop Revenue	\$66,525	\$63,786
Crop Cost	\$51,025	\$54,429
Net Returns	\$15,500	\$9,357

Based on subsurface drip systems and a field size of 50.6 ha/125 acres with net returns of \$306/ha and \$185/acre.

O'Brien, Daniel, Danny Rogers, Freddie Lamm, and Gary Clark. "An Economic Comparison of Subsurface Drip and Center Pivot Sprinkler Irrigation Systems." *Applied Engineering in Agriculture* 14 (1998): 391-98.

System Costs

Type of Irrigation	Gross Cost (USD\$/Ha)
Center Pivot	\$2,465.00*
Subsurface Drip	\$4,075.00**
Savings	\$1,610.00

Dumler, Troy J., O'Brien, Daniel M., Rogers, Danny H. "Irrigation Capital Requirements and Energy Costs." Kansas State University (2007). *Costs include the system, well, water meter, well connectors, pump & gearhead, and power unit.

Cut Labor Costs. Save Time.

Drip systems are notorious for the amount of labor required to operate and maintain them. It can take several hours to walk a field monitoring, flushing, and maintaining the filters and lines. Not with center pivots.

One person can run multiple machines covering thousands of hectares using today's computerized controls. Not to mention that you don't have to hire people to install and remove equipment season after season.



Labor Comparison Between Subsurface Drip Irrigation and Center Pivots

TIMING	SDI	CENTER PIVOT
Daily Maintenance	Flush filter	
Weekly Maintenance	Flush lines	
	Chlorinate	
Monthly Maintenance	Flush lines	Grease Swivel
Annual Maintenance	Filter	Check oil levels in gearboxes
	Check valves	Check oil levels in centerdrives
	Confirm emitter performance	
	Chlorinate	

Comparing Drip and Pivots? There Is No Comparison.

Initial Cost

- Pivots typically cost between \$800 and \$1,200 per hectare.
- Drip systems cost 20% to 100% more than pivots.

Maintenance Cost

- The normal, annual cost to maintain a drip system is about 7-10% of the initial investment.
- On a center pivot used 2,000 hours per year, the annual maintenance cost is about 1-2% of the original purchase price.

Management

- The 50,000 emitters on a 50-hectare drip system require considerably more dedicated management than center pivots. And that doesn't even take into account the filter, drip lines, system controls, and higher pressure pump sets.
- The 150 sprinklers on a 50-hectare center pivot installation are easily maintained with a convenient system control.

Design

- The performance of a subsurface drip system is highly dependent on the skill and knowledge of the designer.
- Pivot installations are fairly simple to design.

Installation

- Installing a drip system is difficult. You must choose tape depth carefully for compatibility with cultivation practices to ensure the drip tape isn't damaged.
- Pivot installation is an easy and standardized process.

Germination

- Subsurface drip systems can't stimulate seed germination if the drip tape is placed below the root zone.
- Sprinkler heads on a pivot apply water similar to the effect you get from rain, causing seeds to germinate. In fact, pivots can easily be fitted with a dual sprinkler package — one for germination and one for irrigation. On the other hand, some drip irrigators use sprinklers just for germination.

Plugging and Leaking

- With a drip system, you must apply acid and periodically chlorinate the drip line to dissolve mineral concentration that can plug emitters. And you have to spray herbicides to kill roots that could wrap themselves around water lines.
- The above ground sprinklers on a pivot are visible at all times, so plugging and leaking aren't a problem. An average nozzle on a pivot is 16 times larger than a drip emitter.

Filter Maintenance

- You must constantly monitor drip system filters, then flush or change them when necessary to prevent system failure.
- Typically filtering is not required when using a pivot or linear.

Life Span

- A typical drip system has a life span of approximately 10 years.
- A typical Valley pivot has a life span of 20-plus years.

Salt Build-Up

- Drip irrigation causes salt to accumulate at the dividing line between the irrigated zone and the non-irrigated zone in the soil, so that the soil becomes salinized over time. Eventually a sprinkler system will have to flush the accumulated salt below the crop root zone for the field to remain fertile.
- Above ground sprinklers distribute water evenly over the surface, which irrigates the crop and leaches the salts in the soil to below the root zone.

Pests

- Rats, crickets, corn borers, and mealy worms can attack vulnerable drip tape and cause leaks. You must dedicate a lot of time and money to combat these pests.
- Pests cannot easily damage the steel structure and spray nozzles of a center pivot.

Crop Rotation

- With a drip system, crop rotation is difficult because of the predetermined row spacing. The optimum row spacing of one crop, such as watermelons (1.8 meters) is not ideal for a rotation crop such as cucumbers (.9 meters). Rotating cucumbers into a watermelon field will result in a loss of 50% of the yield.
- With center pivots, you can easily rotate your crops as often as necessary, or your pivot circle can be segmented with different crops.

Resale

- You have to frequently replace drip tape, which is 20-25% of the total cost of a drip system. And once removed, it has no resale value whatsoever. In fact, removing the tape costs money.
- Even after 15 years, a Valley pivot still holds a resale value of 50% of the initial purchase price.

Environmental Impact

- Typical drip tape lasts 5 years. After that, many drip irrigators have to contact hazardous material experts for proper disposal of the used tape.
- Valley equipment is made of 100% recyclable steel.



See your local authorized Valley dealer for complete details.



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AD10715 C 09/14