ALFALFA PRODUCTION WITH SUBSURFACE DRIP IRRIGATION

GROW MORE ALFALFA WITH LESS WATER
WHY DRIP IRRIGATION?

Of the common agronomic crops, alfalfa consumes the largest amount of water. Its consumptive use can exceed 46 inches of water per year. The main reason growers are interested in using drip irrigation on alfalfa comes from the desire to better manage this increasingly expensive crop input. Alfalfa is a deep-rooted perennial forage crop that is mainly planted for hay production or grazing. When compared to other forage crops, alfalfa has a very high yield potential and responds very well to subsurface drip irrigation (SDI). A key benefit of irrigating alfalfa with SDI is the ability to irrigate during and immediately following harvest allowing for rapid re-growth which can result in more cuts and higher yields.

Subsurface drip irrigation is a management tool that allows precise control over the root zone environment of your alfalfa crop. This control can be used to increase yields, reduce water needs and runoff or better manage crop quality. But with any management tool there are trade-offs. Many growers find they can obtain one to three extra harvests per year using the same amount of water as with their previous irrigation system. Others can reduce water consumption but do not experience greater harvests.

Advantages of Subsurface drip irrigation include:

- Rapid re-growth from irrigating immediately following and even during harvest
- Reduces plant stress which increases the yield per cutting
- Reduces intervals between cuttings which increases the number of cuttings
- Fewer weeds because the soil surface is kept dry
- Longer stand life by managing irrigation to produce healthier root systems

WHAT KIND OF RETURN CAN I EXPECT?

Managing irrigation with a Netafim subsurface drip irrigation system provides greater opportunity for growing higher yields with less water. The return on investment depends primarily on yield achieved, the price of alfalfa produced and the cost of water. In many cases, we have calculated a 2-3 year payback for a complete Netafim irrigation system.

WHAT ARE THE MAINTENANCE REQUIREMENTS?

Like other subsurface drip irrigation systems, the maintenance requirements are dependent mostly on the water quality. The system will need to be flushed at regular intervals and cleaned 2-8 times a year. This cleaning normally involves flushing with either chlorine or acid to remove any algae or sediment build-up in the drip line.

HOW CAN I CONTROL RODENTS?

Netafim has compiled an integrated management solution that, when implemented properly, will reduce the risk of damage to the crop and dripline. One exciting new product that Netafim has developed is a dripline maintenance product that is an irritant to rodents. When injected into the driplines, it disturbs the rodents, driving them to the surface where they are vulnerable to owls, hawks and other predators.

ECONOMICS

In the last few years, alfalfa prices have achieved record highs. As the world’s per capita income increases, the demand for protein also increases. Much of this protein is provided via milk and beef: both dependent on alfalfa for sustainable production. The U.S. has been increasing exports of milk over the years and this demand will only increase. Experts predict that the price of alfalfa will remain protected from dramatic shifts in market prices.
For over 40 years, Netafim has been the leader in drip irrigation. The best solution for every climate, drip irrigation outshines other irrigation methods through the advantages it delivers. Faster plant growth allows growers to earn more, sooner. Yields are increased while water costs are reduced.

Netafim’s product line has expanded and evolved over time to offer the most comprehensive array of drip irrigation products available. We’ve provided increased yields for crops like:

- Tomatoes
- Cotton
- Row Crops
- Nuts
- Citrus
- Potatoes

Now, we’re leading the industry as the drip irrigation experts for ALFALFA.

Netafim offers complete turn-key installation that guarantees system compatibility and performance. We’re ready to show you how you can “Grow More With Less” using Netafim subsurface drip irrigation on your Alfalfa crop.

**Netafim Products - High Quality, Superior Performance and Long-Life Reliability**

**Typhoon Thinwall Dripline**
- Polyethylene material with injection molded drippers welded into the wall of seamless tubing is stronger and more durable than other tapes
- Install at 14” depth on 40” centers

**Valves and Air Vents**
- Simple, reliable design for superb hydraulic performance and high resistance to chemicals
- More air release capacity for maximum irrigation system protection

**Apollo Disc-Kleen Filter**
- Disc filter provides advanced depth filtration with less pressure required for cleaning
- Pre-assembled with small footprint making it easy to move

**Why Netafim?**
On the high plains of Texas outside Lubbock, a land of cotton and more cotton, farmer Randy McGee was already considered a bit of a maverick for growing alfalfa. Then 8 years ago, he decided to do something that no alfalfa farmer in this stretch of the wind-swept plains had ever done.

He took a section of his land, 55 acres to be precise, and installed a subsurface drip irrigation system. He had a hunch his yields might jump after a neighbor told him he had increased his cotton production by 33% with a Netafim drip system.

But even McGee was surprised at how well his alfalfa did on drip. By the second year, his yields had more than doubled - shooting up from 5.5 tons to 11.5 tons an acre. That's more hay than he had ever seen come off a field. He wasted no time expanding the Netafim drip system to another 55 acres.

“The difference has been dramatic,” said McGee, 35, sitting behind the wheel of his brand new red Dodge 3500 Ram, waiting for his first alfalfa cutting of the new season. “In the alfalfa business, if you’re making $2,000 an acre on hay, that’s a home run. With Netafim drip, we’re making $3,000 an acre. That’s some big money.”

Not only have his yields remained consistently high, but the quality of McGee’s drip-irrigated hay is second to none. His Relative Feed Value (RFV) has jumped from 180, which is considered good, to 230 in some cuttings, which is considered superior. As a result, the cows at the local dairy munching on McGee hay have increased their milk output from 65 to 80 pounds a day.

“Each haystack at the dairy has a RFV value listed next to the grower’s name. It’s a pretty good feeling driving through and seeing your name with a 220 or 230 RFV next to it, and the other stacks say 180 or 200.”

Before drip, the quality of McGee’s alfalfa cuttings always diminished as the season wore on. Now, McGee’s late summer cuttings rank right up there in quality with his early season cuttings. A drip-watered stand is a happy stand, he says. “Nearly every cutting is hitting the 200 RFV mark.”

Before drip, the sprinklers irrigating his alfalfa would roll across the field and “blow the water up in the air so you’d lose a lot to the wind and evaporation.” Now, with drip, “every bit of the water is applied right to the root zone so it doesn’t matter if the southwest wind is blowing 40 miles an hour,” McGee said. “The water still gets to the alfalfa.”

This is not to say that drip irrigation doesn’t present some challenges like gophers and sediment-clogged lines. But McGee says these can be routinely dealt with through basic maintenance. “Yes, you have to stay on top of the gophers. And if you’re driving through the field and see a leak, you fix it right then. For the most part, it hasn’t been a problem. The system is very durable.”

As for the $1,700-an-acre cost to install a subsurface drip system, McGee’s says the increased yields more than covered it. He was able to pay off his Netafim system in just four years. Now he’s making plans to install drip on more of his 900 acres. “We’re going to expand. That’s for sure.”
Precision farming is nothing new in the middle of California, the nation’s most productive agricultural region. But San Joaquin Valley grower Seth Rossow believes that drip irrigation allows him to be an even more exact farmer.

Rossow, 26, grows alfalfa hay for 2,250 milking cows at the Wilgenburg Dairy in Hanford. His Netafim drip irrigation system not only uses 20% less water than flood irrigation, but he can now apply the water in doses that tease out higher production.

“Old fashioned flood irrigation doesn’t let you play with the plant. You simply turn on the pump and wait four days for the water to go from one end of the field to the other. But a drip system covers the whole field at the same time, and it takes only few hours to irrigate.”

Because Rossow can deliver the water with such precision - a shot here, a shot there - he can keep the stand from stressing, thereby delaying its bloom. “The longer you delay bloom,” he says, “the higher the quality of your alfalfa.”

Rossow grows 600 acres of alfalfa in Chowchilla - 400 acres on drip and 200 acres on flood. The difference in bloom can be stark. “The flood field gets to full bloom by 30 to 34 days. With drip, I’ve gone over 35 days and had only 5 percent bloom.”

This spring, his second season on Netafim drip, the yields also have shown a marked difference. The flood-irrigated field produced 1.2 tons an acre in the first cutting. The drip irrigated field produced 1.9 tons an acre.

“We were hoping to see a jump, and we’ve certainly seen it with the first cutting in April. It’s definitely moving in the right direction. I’m glad we made the move to drip.”
On the basin of old Tulare Lake, once the largest body of freshwater west of the Mississippi, Larry Bettencourt was growing alfalfa the old way - by flooding his fields. Problem was, the heavy black soil kept drying and cracking, the deep fissures filling with irrigation water and fracturing again. The hay stand was literally drowning. “By the third cutting, we’d have to abandon the field,” said Bettencourt, 57, a third generation California farmer whose Portuguese grandfather immigrated to the San Joaquin Valley from the Azores in 1918.

So Bettencourt, who farms 700 acres of his own land and another 1,700 acres for a dairy along the Kings River, decided to give drip irrigation a try. Four years ago, he brought in Netafim to convert 100 acres of alfalfa to subsurface drip irrigation. This was right beside another 100 acres of alfalfa irrigated by flood.

He noticed two changes right off. One, the drip-irrigated land no longer cracked and turned to bog. Two, the yields on both fields started off the same but by the third cutting, the drip-irrigated field outpaced the flood-irrigated field by more than two to one. It maintained its margin all the way through late summer. “I’m averaging 3/5 tons more an acre with drip than I am with flood irrigation,” Bettencourt said. “And I’m using less than half the water to do it. The conventional field takes five to six days to irrigate. I can irrigate the drip field in 24 hours. And there’s no runoff, no tail water. I just apply what I need.”

Bettencourt has every confidence that the drip lines will last seven to eight years, maintaining the alfalfa stand for the entire stretch, doubling profits from start to finish.

“Drip is where it’s at. Whatever crop you’re trying to grow, if your yields have just been okay at best, try drip. The difference here has been like night and day. By the fourth cutting, the drip-irrigated field is yielding 1 ¾ tons an acre compared to the one ton an acre in the flood-irrigated field.

“And it’s not just alfalfa. I have a neighbor who never tried putting a tomato in the ground, and he went on drip and suddenly he’s getting 70 tons of tomatoes an acre.”

Bettencourt is so gung-ho about drip that he will soon install a Netafim system on 130 acres of wheat land that he’ll turn into alfalfa. “Drip is allowing us to farm land we would not be able to farm because of tough ground,” he said. “You could say we’re making hay with drip.”
Tucked between Brawley and the Salton Sea, Jon Shields farms the land his great-grandfather farmed, raising 700 acres of wheat and alfalfa for hay and seed on the flatlands of the Imperial Valley.

A fourth generation California family farmer, Shields isn’t one to pay much mind to hype. He had heard all the talk about the “miracle” of drip irrigation but had yet to see it for himself. So four years ago, Shields converted 36 acres of seed alfalfa to Netafim drip and watched it grow next to a seed alfalfa field watered by flood irrigation.

“These two fields happen to be side by side, which allowed us to conduct an experiment of sorts. We compared yields, water use and income. The field irrigated by drip outperformed the field irrigated by flood in every way. The yields were quite a bit higher, and the water costs were quite a bit lower. Drip irrigation changes our bottom line - for the better. We’re happy with it. Definitely happy with it.”

When growing alfalfa for seed, Shields says, it’s best that the ground be dry as the seed matures. But that’s not always possible with flood irrigation. Drip lines, on the other hand, are buried at least a foot below the surface, providing the seed with a dry zone to mature. “Preventing water damage increases yields and improves quality. We’re getting around 30% more seed alfalfa yields on drip than flood.”

Because the 52-year-old Shields farms on sandy loam and loses lots of water to evaporation and percolation, drip irrigation makes extra sense. “In my flood field, it takes four hours for the water to make its way down the row. With drip, the whole field is being watered uniformly.

“Because you can deliver water more precisely with drip, I can get a better bloom set on my alfalfa. If I want to apply a quarter inch of water, I can. If I want to apply a third of an inch of water, I can. Drip really gives me a lot more flexibility. It allows for precision farming.”

The weeds are fewer with drip, and the stand more uniform. And Shields has found an effective program to manage gopher problems - a gas-run engine that pumps deadly fumes into the burrow. He also flood irrigates his drip field in fall and winter to drown whatever rodents he can. “If you let them get out of hand, they can do a lot of damage to your drip lines and your alfalfa. But we’ve been able to control them by being proactive and watching for any burrowing activity after every cutting.”

In the desert climes of Imperial, a stand of alfalfa usually lasts only four years, Shields said. But his drip-irrigated field is doing so well that Shields thinks he can extend the productive life.

“Typically, it’s the fourth year when the plant goes into decline and you see the wear and tear. That’s when you rotate in another crop. But on our drip irrigated field, we’ve got a lot more vigor. Enough vigor that we’re hoping to squeeze out another year or two of strong yields.”