Strategies for Farming with Limited Water

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The following is an article we developed for Klamath Basin Producers but I figured the concepts would be of interest to many growers in the rest of Siskiyou County as well.

Given the uncertainty of water deliveries in 2010, here are some strategies to consider for optimizing profits with limited water supplies. Information contained in this article will address frequently asked questions and potential circumstances you may face this year. Monitoring crop water use and soil moisture is always important; however, it is even more critical during years of limited water deliveries. Knowing the status of available soil moisture is critical to make proper decisions on fertilizer inputs, harvest strategies, and pest management. If you're fortunate enough to have well water this year, monitoring crop water use can help you spread limited water supplies efficiently across all your fields. You don't want to over-apply water or irrigate too frequently when your crops don't need water and you don't want to under-apply water when your crops need water most.

Over-irrigating can exacerbate nutrient leaching and provides an ideal environment for fungal diseases. Likewise, moisture stress often leads to an increase in pest problems. Many growers may be tempted to skip pest control treatments this year in an effort to lower input costs. Unless yield is so low you don't plan to harvest the crop, this is usually a mistake that will result in yield and quality losses that exceed the cost of treatment.

In alfalfa, weeds consume spring soil moisture quickly-moisture that would otherwise be available for the first cutting of alfalfa. Weeds also decrease hay quality and produce seeds that will persist for the rest of the stand's life. In wheat and barley, studies have shown weeds can decrease dryland grain yields by 25% to 50%. Insect pests can also be worse in a moisture stressed field, so regularly monitoring pest populations and treating according to established economic thresholds is recommended.

Small Grains

- Wheat and barley varieties differ significantly in their yield potential under limited moisture conditions, thus it is good idea to check with your local seed supplier for variety performance under deficit irrigation or dryland conditions. Typically, early maturing varieties will yield more than late maturing varieties when grown under limited soil moisture.

- Consider reducing your seeding rate by 25% if you cannot irrigate. In University trials conducted in the Central Valley of California, wheat and barley grown in drought years produced similar yields when seeded at rates between 90 and 150 lbs/acre.

- Consider harvesting small grains for hay if soil moisture is not adequate for grain fill. Planting a dual purpose variety provides more flexibility for deciding whether to harvest for hay or grain later in the season when crop status and irrigation availability are better known. If soil moisture is not adequate through grain development, grain yield and quality decrease rapidly. Moisture stress prior to the soft dough stage will result in small, shriveled kernels. Harvesting grain forage at the soft dough stage typically maximizes hay yields.

- Apply nitrogen in split-applications. Apply some nitrogen at planting and then top-dress additional nitrogen as needed later in the growing season. If the soil has residual nitrogen from the preceding crop, nitrogen applied at planting is probably not needed. If water is short, you may only need the

nitrogen applied at planting. If it's a wet spring, you can always top-dress additional nitrogen on the field to increase yield potential.

Alfalfa

- Focus on maximizing first-cutting yield if irrigation is limited. Residual soil moisture, potential spring rainfall, and mild spring temperatures often result in a respectable first-cutting yield in the Klamath Basin under dryland conditions. First cutting typically has the highest yield and better quality compared to mid-summer hay so focusing limited water resources on this cutting makes the most sense. Alfalfa will go into a 'drought-induced' dormancy if the soil is dry after 1st cutting. This dormancy state helps prevent plant death; however, alfalfa is very slow to re-grow from dormancy if water is applied to the field later in the season. In most cases, drought-stressed alfalfa will remain dormant until fall and produce little forage during the summer.

- Regularly scout for alfalfa weevil and cowpea aphid this year. In dry years, insect pests are often problematic, and it's best to be proactive when treatment is needed.

Vegetable Crops

- Vegetables producers have few choices in a dry year except to limit production acres to fields with full-season irrigation. Potatoes and onions are very sensitive to drought-stress, and yield and quality plummet with inadequate irrigation.

Cover Crops

- Cover crops can help reduce soil erosion, suppress weeds, and enhance soil health, but they require adequate soil moisture at planting. Cover crops also require production costs that should be taken into consideration such as seed, tillage, and planting costs. If you plan to grow a cover crop without irrigation, it's best to plant a cool-season variety in fall or early spring to take advantage of spring precipitation and cooler temperatures. Dryland cover crops that have performed well in University trials include mustards, small grains, field peas, and vetches.

- If water becomes available in mid-summer, plant a summer annual such as sudangrass or teff that grows quickly in the mid-summer heat. A cheap option to consider is to let weeds serve as the cover crop. Letting winter annual weeds grow until they are 6 to 12 inches tall and then spraying them with a herbicide can help prevent soil erosion. This approach also depletes shallow soil moisture which can prevent summer weed growth. It is IMPORTANT to kill the weeds before they flower and produce viable seed. Otherwise, this is not a recommended practice.

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