Dryland Fallow Management Tips

By Rob Wilson and Thomas Getts, UCCE Farm Advisors

Water curtailment from Upper Klamath Lake in 2021 and 2022 has rushed a new era of land management in the Klamath Basin, "Dryland Fallow Management". Most producers in the Klamath Project do NOT have enough irrigation water (including well water) for all their cropland and some producers do not have any irrigation water. Management of this dry cropland falls into four categories. First, farmers can plant a dryland annual crop. Second, farmers can maintain a perennial crop such as alfalfa without irrigation or plant a dryland perennial crop. Third, farmers can fallow the ground or plant a cover crop. Fourth, the farmer can sell the land. This article addresses dryland fallow management and tips for maximizing success and minimizing pitfalls.

Soil Health

Farmers need to consider several soil health parameters when dryland fallowing land including:

- **Minimize soil erosion**- Maintain plant cover or stubble; leaving fields tilled over the winter is a recipe for terrible soil erosion.
- **Soil nutrients**- Lake-bottom soils with high organic matter can release a significant amount of plant available nutrients especially nitrogen. At IREC, we often see an extra 100 to 150 lbs of nitrate nitrogen per acre in the soil after one year of fallow. Farmers should take a soil sample after the fallow period to determine soil nutrient levels and revise their fertilizer program accordingly! Hint: you may not have to buy any fertilizer!
- **Soilborne diseases-** Fallowing land for 12 months without crop and irrigation can significantly reduce soilborne disease inoculum and nematode pests. Producers should pull a soil sample after fallowing to determine soil pest levels.

Weed Management

Timely control of weeds is critical in fallow fields. Weeds are easiest to control when they are small and actively growing. Controlling small weeds also helps conserve stored soil moisture and soil nutrients. Weeds must be controlled before flowering to prevent weed seed production. All weeds are prolific seed producers and letting weeds set seed for one year can result in a severe weed problem for years to come. There is A LOT of kochia in fallow fields throughout the intermountain region. Kochia develops a deep root and typically produces between 10,000 and 30,000 seeds per plant; large ones can make over 100,000 seeds!

Kochia Seed Bank Scenario: Why it is important to control weeds in fallow ground:

- A field with just one kochia plant per square yard (4840 plants/acre) can easily produce 99 million kochia seeds per acre if kochia is not controlled.
- If a crop is planted the following year, 99 million kochia seeds per acre are waiting in the soil to infest the crop.
- If the farmer doesn't let a single kochia plant produce seed the following year, the farmer may reduce his kochia seedbank to 20 million kochia seeds per acre remaining in the field after 1 year.
- If the farmer doesn't let a single kochia plant produce seed for a second year, he can reduce the kochia seedbank by 95%. Fortunately, kochia seed has a short seed life in the soil with 95% of seeds dying in the first 2 years. (some weed seeds last decades in the soil)
- A 95% reduction in kochia seed sounds good until you consider 5% of 99 million is still close to 5 million kochia seeds per acre.

Maximizing Herbicide Performance on Drought Stressed Weeds

Plants are most susceptible to herbicides when they are small and actively growing. While heat can help with herbicide activity, heat and moisture stress generally harden plants off making them more difficult to kill with herbicides.

- Heat/moisture stress increases cuticle wax thickness and composition on the leaf making it harder for good herbicide penetration/kill. Stomata holes close and translocation slows.
- Higher herbicide rates and good surfactants are often needed to get some/partial control.
- For non-glyphosate herbicides, oil based surfactants can help melt though the waxy cuticle.
- Glyphosate can be enhanced by using high rates of ammonium sulfate in the spray solution (9-17lb's/100gal), which tie up cations, and acidify the water for better glyphosate activity.
- A good non-ionic surfactant is important to break up surface tension of the spray and help penetrate/get past leaf hairs on weeds.
- Generally spraying at a cooler time of the day with larger droplets can help increase the amount of time the liquid sits on the leaves and can be absorbed (before droplets evaporate).
- Apply herbicides on small weeds before the weeds are stressed, and consider adding a herbicide with some preemergence activity (like flumioxazin for kochia) while keeping plant back restrictions in mind.