



Drought-Proofing Your Farm Checklist

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General strategies

- ✓ Fallow least productive fields if water supply is not sufficient for the optimizing production on all fields
- ✓ Optimize soil fertility to maximize production from available water
- ✓ Use reduced/conservation tillage to improve soil structure and to reduce pre-season water needed to facilitate tillage operations

Use winter precipitation and irrigation run-off

- ✓ Capture storm run-off in ponds/reservoirs
- ✓ Plant fall/winter cover crops to minimize storm run-off from fields
- ✓ Vegetate permanent ditches to slow storm run-off and maximize ground water recharge
- ✓ Furrow dike to slow storm run-off from fields
- ✓ Capture irrigation tail water in basin and reuse for irrigations (food safety)

Reduce evaporation/transpiration losses

- ✓ Irrigate during the evening, morning or night to minimize evaporative losses
- ✓ Control weeds
- ✓ Use plastic mulches and organic residue (cover crop residue) mulches
- ✓ Convert to irrigation systems that wet less soil surface (furrow to drip, or sprinkler to micro-sprinkler)
- ✓ Increase interval between sprinkler irrigations to reduce evaporative losses
- ✓ Use short season and early season cultivars
- ✓ Incorporate or kill cover crops between rows of permanent crops (trees and vines) before the cropping season
- ✓ Time incorporation or killing of winter cover crops to conserve soil moisture for subsequent crop
- ✓ Avoid the use of anti-transpirants

Improve infiltration and water holding capacity of soil

- ✓ Incorporate organic amendments to increase water holding capacity and macropore structure
- ✓ Apply gypsum to minimize crusting of soil surface
- ✓ Rotate with cereal crops (rye, barley, wheat) and/or deep rooted agronomic crops (corn, safflower, sunflower)
- ✓ Correct drainage problems (install tile drainage, break impeding layers)

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Optimize irrigation system design and operation

General practices

- ✓ Evaluate distribution uniformity of irrigation system
- ✓ Audit operation and maintenance of irrigation system
- ✓ Consult with an irrigation system designer
- ✓ Check that irrigation system is operating at recommended pressure
- ✓ Invest in more efficient irrigation system (eg. change from sprinkler to micro-sprinklers in orchard)
- ✓ Train irrigators and irrigation foremen on maintenance and operation
- ✓ Grade field to improve the uniformity of slope
- ✓ Minimize or eliminate irrigation run-off
- ✓ Fix leaks in main and sub main lines

Practices specific to micro-irrigation

- ✓ Install pressure gauges or Schrader valves for monitoring pressure at water source, filter, submain connections, and lateral lines (drip hoses, drip tape).
- ✓ Use pressure regulators at main-submain connections
- ✓ Conduct regular maintenance to prevent clogging of emitters
- ✓ Use the appropriate filter for water source and drip system
- ✓ Repair leaks
- ✓ Replace worn tape/ drip emitters/ micro-sprinklers
- ✓ Limit elevation change along rows to less than 15 feet
- ✓ Consider using pressure compensating tape/drip emitters/micro-sprinklers
- ✓ Make sure main and submain line diameters are appropriate for flow rates

Practices specific to sprinkler irrigation

- ✓ Use appropriate nozzle size for spacing of sprinkler heads
- ✓ Check that the same sprinkler heads and nozzle sizes are used through out the field
- ✓ Irrigate at low wind speeds (< 10 mph)
- ✓ Space lateral lines and sprinkler heads to optimize distribution uniformity
- ✓ Replace worn nozzles
- ✓ Replace worn gaskets
- ✓ Replace sprinkler heads that leak or do not turn
- ✓ Consider replacing impact sprinkler heads with rotator heads

Practices specific to furrow irrigation

- ✓ Surge or pulse irrigate
- ✓ Use torpedo to smooth furrows
- ✓ Shorten length of furrow runs
- ✓ Irrigate alternate furrows
- ✓ Start with high application (intake) rates
- ✓ Improve uniformity of slope
- ✓ Cut-off water when flow reaches tail end of field
- ✓ Re-circulate tail water to head of field

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Improve irrigation scheduling

Practices that can reduce water use

- ✓ Apply appropriate amount of water for pre-plant and early season irrigations
- ✓ Apply appropriate amount of water for germination and transplant establishment
- ✓ Apply appropriate amount of water for salinity management
- ✓ Record volume of water applied (flow meter)
- ✓ Use a timer to automatically shut off pump
- ✓ Consider using regulated deficit irrigation for tree and vine crops

Information to improve irrigation scheduling

- ✓ Know crop water needs (daily evapotranspiration requirement)
- ✓ Know the application rate of irrigation system (inches per hour, gallons per hour)
- ✓ Know the rooting depth of the crop
- ✓ Identify soil type and texture
- ✓ Know water holding capacity of soil
- ✓ Test salinity of irrigation water and soil
- ✓ Understand water stress effects on crop growth, yield and product quality
- ✓ Monitor soil moisture
- ✓ Use tools for monitoring plant water stress (pressure bomb)
- ✓ Use CIMIS or other weather stations for determining daily crop evapotranspiration requirements
- ✓ Use irrigation scheduling software or spreadsheets to aid irrigation decisions