

drought



# Drought Preparedness and Response

## STRATEGIES FOR FARMERS

### BE PREPARED

**Of all natural disasters, drought is the most gradual and hard to predict. Once it has affected crop growth, farmers and producers enter a new territory of what if's. What if it rains next week? What if it doesn't rain for a month? Alternative crops may have to be planted or crop loss assistance applied for. If feed supplies are low, herds may have to be culled and/or feeds purchased. For farmers who were already facing financial hardship, a drought can force major decisions about diversification, irrigation, surviving a major loss or even selling the farm.**

**The fact that Wisconsin suffered record droughts as recently as 1976-77 and 1988 underscores the fact that droughts are a natural occurrence. Fortunately, farmers can take some actions to better prepare for and survive a drought. The key is a combination of sound farmstead planning and sound decision-making, based on advice and up-to-date information from resources like your Cooperative Extension Service.**

- ◆ *Examine your water use efficiency and irrigation needs.* If you already irrigate, contact your agricultural agent about using the Wisconsin Irrigation Scheduling Program (WISP). This research-based program assists growers in determining frequency and amounts of irrigation (if any) throughout the growing season; it can be extremely helpful during a drought. If you do not currently irrigate, consult with your agricultural agent and irrigation system dealers now — before a drought occurs. Emergency irrigation systems are difficult to put in place because of the permitting process (which may take 30 days or more) and possible lack of equipment mid-season (dealers generally sell equipment during the winter and spring). Look carefully at irrigation systems as a long-term investment.
- ◆ *Keep up-to-date forage inventories.* Accurate forage inventories in silos, hay mows and other storage areas help you determine feed supplies during a drought. Note the amount and accessibility of each lot of uniform quality forage. Your local feed representative or agricultural agent can assist you with this process.
- ◆ *Consider alternative on-farm related businesses (AOFRB).* Diversification can be a good long-term approach to revenue shortfalls from drought. Some potential businesses include:
  - a) Alternative crops such as shiitake mushrooms, ginseng, specialty vegetables, greenhouse plants, dried and/or cut flowers, etc.
  - b) Alternative livestock, such as llamas, ducks, bees, deer for venison or mink.
  - c) Forestry, including cord wood, maple syrup, apple orchards and Christmas trees.
  - d) Non-production farm-related ventures such as camping, fee hunting/shooting preserves, trout ponds, farm vacations, bed and breakfast establishments, summer camps on the farm, herd sitting, boat and camper storage, and farm markets.
  - e) Home-based enterprises including sewing projects, crafts, catering services, upholstery, secretarial service/word processing, taxidermy, etc.

Contact your Cooperative Extension office or your Small Business Development Center for more information.

## AFTER A DROUGHT

◆ **Financial issues. Continue to pursue government drought assistance programs if you have not yet received relief; your county Extension office can help you through the application process. Also, see your accountant about tax issues related to the drought. If you received federal disaster payments, you may be able to postpone reporting them on your income taxes for a year. Likewise, if you sold livestock because of the drought, you may be able to postpone reporting gains on the sale for as long as two years afterward.**

◆ **Crop testing for feed. Nutritional values of crops are often affected by drought. Have fresh forage tested for high nitrate levels and nutritional value. Have oats and barley tested for nutritional value; nitrates usually are not a problem. Consult with your livestock nutritionist about corn quality and use. Test for mycotoxins in grain fields.**

◆ **Soil testing. Because of the potential for herbicide and fertilizer carryover, soil testing is very important following a drought year. See the fact sheets "Fertilizer Application After a Drought," and "Herbicide Concerns After a Drought Year," for test recommendations.**

### **Additional resources:**

Your county agricultural agent

## DURING A DROUGHT

- ◆ *Discuss financial and feed assistance in the early phase of a drought.* The earlier you enroll in feed assistance or financial assistance programs, the sooner you will be eligible for help. See your county agricultural agent about eligibility for grants, loans and other types of assistance. Likewise, contact your lender about potential problems before you are in over your head. You may be able to renegotiate current payment plans and establish an emergency plan if the drought persists and additional financing is needed.
- ◆ *Look to your county agricultural agent for up-to-date information on managing during a drought.* As part of a network of county, state and national research and field experts, your agent receives new information daily on managing during a drought. If your agent doesn't have the answer to your question, he or she can find the answer or refer you to the person for help.
- ◆ *Adjust fertilizer rates.* If you haven't already applied fertilizers, adjust your rates based on lower yield expectancy for the drought year. If little or no production is expected, consider skipping an application.
- ◆ *Be prepared to use mechanical weed control.* Many herbicides lose effectiveness during dry periods, making mechanical weed control your second line of defense against weeds.
- ◆ *Protect livestock from heat.* Adequate water, shade and ventilation in buildings are critical during hot, humid weather. Consider letting livestock out of buildings to cool them at night. Call a veterinarian if heat stress is a concern.
- ◆ *Consider alternative crops.* If your fields have less than 12 alfalfa plants per square foot or a 75 percent reduction in corn stand population, consider alternative forages. Some possibilities include sudangrass, sorghum-sudan hybrids, milage and millet. Corn silage might be the best forage alternative; even the worst fields have silage potential. Discuss possible options with your agricultural agent.
- ◆ *Cull unprofitable cattle.* If forage is inadequate, selling unprofitable livestock may be your next best move. Consider culling the bottom 5 to 15 percent. Review your options and the economics of the situation with Extension agents.
- ◆ *Recognize the early warning signs of emotional stress.* Stress can overwhelm farmers and their families. Some of the warning signs of severe stress include anxiety, depression, anger, violence and withdrawal. If you see these signs in yourself, a family member or friend, get outside assistance. Professional counselors, a clergy member or social worker can help, as well as the Farmers Assistance Hotline for Wisconsin at (800) 942-2474.

# Protecting Livestock From Heat

## STRATEGIES FOR FARMERS WHEN TEMPERATURES CLIMB

**When temperatures and humidity begin to rise in Wisconsin, keep a close eye on livestock.**

**Temperatures in the high 80s and the 90s can cause problems, as well as a 75 degree F. day coupled with high humidity. Heat stress can cause general discomfort, decline in animal performance and animal death.**

### PROVIDE SHADE AND NIGHT-TIME COOLING

- ◆ *If animals are kept outside, provide shade during hot weather.* Heat from the sun is a major culprit in overstressed animals.
- ◆ *Swine may sunburn during hot, sunny weather.* Try to keep them out of the sun. Sun shades can cut the radiant heat load by as much as 40 percent; ask your county Extension agent for information on their construction. Pasture wallows are also effective for sunburn protection and wet skin cooling.
- ◆ *Turn cows outside at night to cool them and cool the barn.* Since animals cool themselves primarily through breathing, barns tend to get warm and humid quickly.

### PROVIDE ADEQUATE WATER

Ample drinking water is vital to animals during hot and humid conditions. Animals cool themselves by panting (water loss from the lungs) and through water evaporation from the skin. Increased respiration during hot weather is especially important for pigs and other animals that do not sweat. Animals must replace the water loss to cool themselves.

- ◆ *Maintain access to water.* Provide automatic drinking cups so animals can meet their requirements during hot weather.
- ◆ *Keep water containers clean.*
- ◆ *Adjust the drinking space for the size and number of animals in the pen or group.* Excessive volumes of water grow warm and stale throughout the day. (See the fact sheet “Livestock Water and Nutrition.”)
- ◆ *Check the water delivery systems periodically for plugs or other problems.*
- ◆ *If necessary, spray water on animals to cool them.*

### PROVIDE GOOD VENTILATION

Proper ventilation helps maintain livestock health during hot and humid weather. Without adequate air exchanges and airflow distribution within livestock buildings, heat and moisture accumulate and animal production is affected. Contact a ventilation specialist to inspect and update your system, if necessary. Your county Extension office also may be able to help you.

## BE WATCHFUL

- ◆ *Use the temperature humidity index as a guide to heat stress.* Listen to local or regional weather reports for the temperature humidity index (THI) for your area. Some levels of concern include:
  - a) Above 75 THI - Heat stress on high-producing cows begins to decrease feed intake and lower milk production.
  - b) Above 80 THI - Severe heat stress may occur for cows on pasture. Shade and adequate ventilation are essential to minimize milk loss.
  - c) Above 83-85 THI - Danger of fatal heat stress occurs.
- ◆ *Keep an eye on animals.* If heat stress is a concern, check animal temperature. Dairy cow temperatures approaching 104 to 106 degrees F. are dangerous. At 107 degrees F., spontaneous heart failure is possible. Call a veterinarian and use methods listed above to keep animals cool.

### **Additional resources:**

Your county agricultural agent,  
ventilation specialists, your veterinarian

### **Related publications:**

UW-Extension publications—

“When Temperatures Go Up, Does  
Your Milk Production Go Down?”  
(A2881);

“Cooling Swine,” (PIH87).

Midwest Plan Service publications—

“Heating, Cooling and Tempering Air for  
Livestock Housing,” (MWPS-34);

“Mechanical Ventilating Systems for  
Livestock Housing,” (MWPS-32).

# Managing Livestock During a Drought

WHEN WATER AND FEED SUPPLIES BECOME A CONCERN

**Drought usually gets its reputation from its impact on crops. But its impact on livestock can be equally dramatic. Hot, dry weather increases the water needs of livestock but often decreases water supplies. Crops may not yield as planned, causing a feed shortage. Consequently, farmers may face special challenges, including decisions about whether to buy feed or sell livestock.**

## WATER REQUIREMENTS

Water requirements may increase to double the normal intake for animals during hot weather. Clean, fresh water is important. If animals do not meet their water needs, they may refuse to eat, experience lowered production, become sick or die.

Water supplies also may become a problem as the drought wears on. Wells and piping may be inadequate if water demand increases dramatically; shallow wells and streams may dry up. You may need to transport water. Contact your local emergency government office or your county Extension office for information on water supply assistance.

Some general water estimates for various conditions and animals:

- ◆ *Daily water intake for beef cattle at 88 degrees F.:*
  - a) Cows -16.5 gallons for nursing calves; 14 gallons for bred dry cows and heifers.
  - b) Bulls - 18 gallons.
  - c) Growing cattle - 9 gallons for 400 lb. animal; 12 for 600 lb.; 14 for 800 lb.
  - d) Finishing cattle - 14 for 600 lb. animal; 17 for 800 lb.; 20 for 1,000 lb.; 22.5 for 1,200 lb.
  
- ◆ *Daily water intake for dairy cattle at 80 degrees F.:*
  - a) Dry cows (for maintenance and pregnancy) - 16.2 gallons for 1,400 lb. animal; 17.3 for 1,700 lb.
  - b) Lactating, 1,400-lb. cows (for maintenance and milk production) - 17.9 gallons for 20 lb. milk production; 24.7 for 60 lb. milk production; 38.7 for 80 lb. milk production; 45.7 for 100 lb. milk production.
  - c) Heifers - 3.3 gallons for 200 lb. animal; 6.1 for 400 lb.; 10.6 for 800 lb.; 14.5 for 1,200 lb. (for maintenance and pregnancy).
  
- ◆ *Average daily water intake for swine:*
  - a) Breeding herd - 2 to 3 gallons for gestating sows and boars; 4 to 5 gallons for lactating sows.
  - b) Young pigs - One-half to 1 gallon for weaned pigs (15-50 lb.); 1 gallon for growing pigs (50-120 lb.); 1.5-2 gallons for finishing pigs (120 lb. to market).

Increase amounts for hot, dry conditions.

## WHEN FEED BECOMES AN EMERGENCY

Feed supplies may run low if crops are compromised or lost because of dry weather. Farmers unable to afford additional feed may face an emergency situation. Some considerations include:

- ◆ *Develop an inventory of livestock numbers and feed supplies.* An inventory will help you plan for current and long-term feed needs.
- ◆ *Get advice and assistance.* When a feed shortage is imminent, contact a nutritionist or your county Extension office for guidance, your lender for early discussion of potential problems or needs and the Agricultural Stabilization and Conservation Service (ASCS) for feed assistance program information.
- ◆ *Two major options when facing a feed shortage are to:*
  - a) Buy or obtain additional feed. Feed assistance may be available from relief groups, the ASCS or through loans. Volunteer organizations typically offer hay lifts during drought years. Contact your county Extension office for more information.
  - b) Sell non-essential animals. The money received can help buy additional feed for remaining animals.
- ◆ *Plant alternative crops for forage.* A number of crops, including 70-day corn, buckwheat and millet, may be planted mid-summer to offset early losses. (See the fact sheet “Alternative Crops During a Drought.”)
- ◆ *Talk about it.* Drought can bring feelings of great anger, frustration and hopelessness to farmers, especially for those already experiencing tough financial times. It's critical that producers talk about the stress they are feeling, rather than isolating themselves from family or neighbors. In some cases, intervention may be needed to connect farmers with counselors, clergy members or other professionals. (See the fact sheet “Identifying Stress in Family and Others.”)

### **Additional resources:**

Your county agricultural agent; your county family living agent; the Agricultural Stabilization & Conservation Service; your local lender; Farmers Assistance Hotline (for Wisconsin farm families), (800) 942-2474; health and human service workers; financial and legal assistance agencies

### **Related publications:**

UW-Extension video “Managing During Tough Times,” (VB0052).

# Tillage During a Drought

WHAT TO DO – AND NOT TO DO – WHEN SOILS ARE DRY

## GENERAL GUIDELINES

**The best advice on tillage during a drought may be: avoid it. When soils are dry, you should do everything you can to conserve remaining moisture. This may mean holding off on plowing, disking and cultivating so as not to disturb soils and let moisture escape in the process. Keep in mind that any operation that brings soil up to the surface may worsen conditions.**

**The guidelines at right offer some general considerations. For advice specific to your crops and drought conditions, contact your county Extension agent.**

- ◆ *Minimum tillage.* Try to use minimum tillage techniques if possible. These will leave crop residue from the preceding year on the surface, thereby reducing evaporation of moisture from the soil. Conservation tillage may be a particularly good method because it leaves more than 30 percent of the residues, such as old cornstalks, in fields after planting.
- ◆ *Weed control.* Use chemical weed control, rather than tillage, to manage weeds. With chemical weed control, you avoid disturbing the soil and causing moisture loss.
- ◆ *Planting.* While it helps to plant in the moist soil below the dry surface, don't plant beyond the maximum recommended depth for your crop.
- ◆ *Tilling.* If you must till, keep it at a shallow level. For example, when field cultivating, use a depth of 2 to 3 inches, rather than 4 to 5. Do not subsoil.
- ◆ *Chisel plowing.* If using a chisel plow, use sweeps instead of twisted shovels on it. The sweeps bring up less soil, while leaving more crop residue on the soil surface. As a result, less moisture is lost from the soil.

### Additional resources:

Your county agricultural agent

### Related publications:

UW-Extension publications–

“Planting for Conservation Tillage,”  
(A3396);

“Row Crop Cultivators,” (A3483);

“Optimum Corn Planting Practices,”  
(A3264);

“Conservation Tillage for Corn,”  
(A3091);

“Making Conservation Tillage Work for  
Corn Production on Your Soil Type,”  
(A3386);

“Managing Drought-Stressed Corn and  
Soybeans,” (NCR238).



# Irrigation During a Drought

## CONSIDERATIONS FOR NON-IRRIGATING FARMERS

**Drought conditions are great anxiety producers, especially if you don't normally irrigate your crops. As painful as it may be, however, the best advice for non-irrigators is often to wait things out during a drought. While some irrigation equipment may be available on an emergency basis from dealers or area irrigators, the permitting process for surface water or groundwater sources can take well over a month. Furthermore, the manpower, training, and financing needed to develop an irrigation system make it unrealistic as a short-term solution. Running an irrigation system can be a full-time job in itself, one that can take three years to master, and one that may take ten years to pay off through increased production.**

**One thing you can do is realistically evaluate whether an irrigation system makes sense for you in the the long run. Follow the guidelines at right to make this determination and to understand the processes involved in setting up an irrigation system.**

### DO SOME RESEARCH

Consider irrigation in relation to your type of crops, soil, water availability, time and farm budget. Irrigation systems have become increasingly sophisticated—something that makes them more valuable in terms of productivity, but also more of a commitment in terms of time, management and financial investment. Discuss the matter with your county Extension office, other irrigators and equipment dealers.

- ◆ *Collect information on your soils and local climatic conditions.* If you have a sandy soil with lower water-holding capacity, for instance, an irrigation system can make a significant difference in crop yields. You can get a county soils report from the local USDA Soil Conservation Service office, county Extension office or Land Conservation department.
- ◆ *Examine the types of crops you currently grow for root depth and therefore, water needs.* You want to be sure that irrigation equipment costs will be offset by an increase in yields or quality of crop. You should also consider the possibility of growing higher value crops (using irrigation) such as potatoes, strawberries, sweet corn, dry beans, snap beans, cucumbers, potatoes and carrots. Are they realistic for your soil type and climatic conditions?
- ◆ *Consider water sources.* Contact the Wisconsin Geological and Natural History Survey for information about groundwater sources for your area. See the section below for guidelines regarding surface water.
- ◆ *Talk to irrigation equipment dealers about irrigation systems and what might be appropriate for your current or future needs.* Topography and field size are two of many factors affecting system needs.
- ◆ *Consider the economics of irrigation.* Discuss potential yields with other area irrigators as well as your Extension agent. In general, irrigation may more than double yields in a field, and pay for itself within 10 years. Increases may be 75-80 bushels of corn per acre and four tons more alfalfa per acre. However, success with irrigation varies depending upon soils, weather, climate, type of irrigation, etc.
- ◆ *Assess your current economic conditions.* Talk to your lenders. Irrigation may not be a good idea right now because of the financial burden. However, it may be something to plan for in the future.

## SURFACE WATER AS AN IRRIGATION SOURCE

Surface water diversions generally cover rivers, lakes and streams. Riparian land—land which adjoins these waterways—is the first requirement for irrigators. In order to obtain a surface water diversion permit from the DNR, you also will need:

- ◆ A legal description of the land to be irrigated, such as NE1/4 of SE1/4 of Sec. 23, T14N, R10E.
- ◆ A waiver from downstream irrigators, hydropower dams, municipal or industrial waste dischargers.
- ◆ A “chain of title” test (an abstract examined by an attorney), which determines the acreage of riparian land.
- ◆ The proposed diversion, including the maximum pumping rate of the diversion, the maximum acreage to be irrigated (tillable acres), the type of crop, inches of water per irrigation, maximum number of irrigations anticipated per growing season, start and end dates of irrigation per growing season.

## GROUNDWATER AS AN IRRIGATION SOURCE

Groundwater diversions are covered by DNR high-capacity well permits. These wells pump 70 gallons per minute (gpm) or more. Contact a local well driller of the DNR District water manager to initiate the permitting process.

For a well permit, you will need:

- ◆ General information on water needs, property ownerships, location and operator.
- ◆ Design information, including a well driller's report and pump information.
- ◆ A DNR site inspection for local contamination.

## IRRIGATION EQUIPMENT

Irrigation equipment dealers can be very helpful in assessing your needs and potential for irrigation. Equipment ranges from large-volume traveling sprinklers which can cover 100 acres in a week to center pivots which water up to 133 acres in two days. The supply of equipment is somewhat limited during the growing season. Most equipment is sold and delivered during the winter and early spring. Keep this in mind as you begin irrigation system planning.

### **Additional resources:**

Your county agricultural agent, equipment dealers, the Department of Natural Resources, the Wisconsin Geological & Natural History Survey

### **Related publications:**

UW-Extension publication—“Irrigation Management in Wisconsin—the Wisconsin Irrigation Scheduling Program,” (WISP), (A3600).

# Fertilizer Application After a Drought

## CONSIDERATIONS FOR THIS YEAR AND NEXT

**Generally, fertilizer application is not much of an issue during a drought year. Fertilizers often have been applied before the true extent of a drought is known. If they haven't already been applied, you need to adjust rates based on lowered yield expectancy for the drought year. If little or no production is likely, it may be best to skip an application.**

**Fertilizer use does become a significant issue the year after a drought, however. Low crop yields during the drought year mean that significant amounts of unused nutrients could remain in the soil at the end of the growing season. Where nutrient carryover is substantial, fertilizer needs for the following year are likely to be affected. Several methods are available to help growers determine nitrogen, phosphorous and potassium carryover and current needs.**

## PHOSPHOROUS AND POTASSIUM CARRYOVER

If phosphorous or potassium was applied but not used because of lower than expected yields, it usually remains in the top few inches of soil. It will not be lost over the winter. Therefore, the unused portion can be credited against nutrient needs for next year's crops.

- ◆ *A formula for determining carryover.* One method for estimating unused phosphorous and potassium is based on the ratio of the actual drought-year yield and the yield goal used to determine nutrient applications that year. For example:

Drought year application = 75 lb./acre phosphate  
= 300 lb./acre potash

Drought year yield goal = 6 tons/acre (alfalfa)

Actual yield = 2 tons/acre

Actual yield/yield goal =  $2/6 = 1/3$

Therefore,  $2/3$  of drought-year application is unused

Estimated carryover =  $2/3 \times 75$  lb./acre = 50 lb./acre phosphate  
=  $2/3 \times 300$  lb./acre = 200 lb./acre potash

Comparison of the actual yield with the expected yield shows that the drought-year yields were  $1/3$  of the goal. Under the assumption that nutrient removal is proportional to yield, approximately  $2/3$  of the phosphate and potash applied in the drought year was not used and likely will be available to the next crop.

- ◆ *Soil tests.* Routine soil tests also can be used to determine the current levels of available phosphate and potash, and to obtain fertilizer recommendations. They are useful for detecting carryover where relatively large amounts of nutrients were applied in the drought year, such as in topdress maintenance fertilizer programs for alfalfa. Relatively small amounts of carryover, such as those that could occur following application in a maintenance program for corn, might not be detected. The tests may be done in spring or fall.

## NITROGEN CARRYOVER

Following a drought year, most nitrogen carryover exists as nitrate in the plant root zone. However, the possibility of overwinter loss of residual nitrate makes estimation of carryover more difficult than for phosphorous

## SOIL TESTING LABS

Soil testing and analysis are available from the University of Wisconsin soil testing labs in Madison and Marshfield, and other private soil testing labs. Your county Extension office can provide names and locations of commercial labs performing these tests in your area, as well as more specific sampling instructions and forms. To contact the Madison and Marshfield labs:

**Soil & Plant Analysis Lab**  
5711 Mineral Point Road  
Madison, WI 53705-4453

phone: (608) 262-4364

**State Soil & Forage Lab**  
Marshfield Ag Research Station  
8396 Yellowstone Drive  
Marshfield, WI 54449

phone: (715) 387-2523

### Additional resources:

Your county agricultural agent, soil testing labs, fertilizer dealers, crop consultants.

### Related publications:

UW-Extension publications—

“Wisconsin’s Preplant Soil Nitrate Test,” (A3512);

“Sampling Soils for Testing,” (A2100);

“Step-by-Step Guide to Nutrient Management,” (A3568);

“Nutrient Management Practices for Wisconsin Corn Production and Water Quality Protection,” (A3557).

and potassium. The amount of residual nitrogen in the soil at the end of the growing season must be considered, as well as factors affecting overwinter loss. Specifically, nitrogen carryover is likely where:

- ◆ *The drought-year crop was corn or a non-legume.*
- ◆ *The crop received moderate to high amounts of nitrogen as fertilizer or as legume or manure nitrogen credits.*
- ◆ *Yields were below expected levels.*
- ◆ *Soils are silt loam or heavier-textured.*
- ◆ *Overwinter precipitation amounts are normal or below normal.*

## TESTING FOR NITROGEN CARRYOVER

A preplant soil nitrate test should be used to determine how much nitrate has remained in the soil until the next growing season.

- ◆ *Sample in the spring.* Soil samples should be collected in the spring after the frost has left your fields and before preplant applications of nitrogen fertilizer.
- ◆ *Collection methods.*
  - a) Take at least 15 random soil cores from uniform soil areas no larger than 20 acres.
  - b) Take separate samples from areas with soil or management practice differences.
  - c) Sample in 1-foot increments to a depth of 2 feet.
  - d) Each sample should be placed in a clean container marked for the appropriate depth.
  - e) Thoroughly mix the soil from each depth and collect a 1-cup subsample. This sample should be sent to a soil testing lab for analysis.
- ◆ *Air dry or freeze samples.* Do not store or send composite samples to the lab in moist condition. If samples can't be taken to the soil testing lab within one day after collection, they should be air-dried (by spreading on clean paper for 24 to 48 hours) as soon as possible. Another option is to freeze your samples immediately after collection and then either transport them to the testing lab while still frozen or air-dry the samples before shipment.
- ◆ *Provide background information.* The soil testing lab needs to know if you applied manure to your sampled fields or if the previous crop was a legume.
- ◆ *Provide the soil name.* The name of the predominant soil and its organic matter content within the sampled area is needed.

# Weed Management During a Drought

## HERBICIDE EFFECTIVENESS AND MECHANICAL MEASURES

**Dry weather after planting causes many concerns, including the impact of weeds on annual crops. Many herbicides lose effectiveness during dry periods; growers who use herbicides on corn and soybean crops are likely to be affected. Fortunately, an awareness of herbicide effectiveness and the aggressive use of mechanical weed control measures can make a difference.**

### SOIL-APPLIED HERBICIDES

- ◆ *Preplant incorporated herbicides.* These are applied before planting and mixed into the soil. They work best when:
  - a) the product is mixed uniformly with soil to the depth recommended by the manufacturer;
  - b) soils have reasonable moisture levels after incorporation has been completed.

If the soil is only slightly dry, incorporated herbicides generally perform adequately. Seldom is it so dry early in the season that incorporated treatments fail. In a true drought, however, they may not give acceptable weed control. Therefore, be prepared to cultivate if weeds appear.

- ◆ *Pre-emergence herbicides.* These depend totally upon rainfall after applications to “activate” the product. Rainfall positions the chemical in the upper soil surface where the weed seeds germinate; there is no chemical change as perhaps the term “activate” suggests. To obtain adequate herbicide activity, however, rain must fall within 10 to 14 days after the seedbed was prepared. Without such precipitation, pre-emergence herbicides generally fail to give acceptable weed control even if a true drought does not develop. Therefore, mechanical weed control may become critical within weeks of planting. Two examples:
  - a) If a field is prepared to plant on April 30, corn is planted on May 1 and a pre-emergence herbicide is applied on May 2, rainfall of at least one-quarter to one-half inches is needed within 10 to 14 days to assure adequate performance. If rainfall does not occur by May 12, the grower should begin rotary hoeing.
  - b) If a field is prepared on April 30 and corn is planted on May 10, followed by pre-emergence herbicide on May 11, plan to rotary hoe on May 12 unless rainfall is very likely in the immediate future.

As illustrated above, when planting and spraying are close to the field preparation time (example a), there is more time to get the needed rainfall to make a surface-applied herbicide perform adequately. As time between field preparation and spraying increases (example b), there are fewer days after an application to get a timely rain. Thus, rotary hoeing becomes necessary sooner.

## ROTARY HOEING

Rotary hoeing kills weeds that have germinated but have not yet emerged. These weeds are in the “white root” stage of development. After weeds emerge, rotary hoeing is less effective. Rotary hoeing also helps place the herbicide in the upper soil surface so that when rains do fall, the herbicide is in a better position to be quickly taken up by weed seedlings and hopefully kill them. If it has not rained within seven days of the first rotary hoeing, make a second pass with the rotary hoe to kill the next generation of weeds.

## POST-EMERGENCE HERBICIDES

Post-emergence herbicides also may fail in dry weather. These treatments work best when weeds are actively growing. When weeds are stressed by lack of adequate soil moisture, chemical control declines. If you decide to apply post-emergence herbicides under very dry conditions, be aware that crop injury may occur and weed control will be poor.

## CULTIVATION

In all situations, be prepared to cultivate once or twice following rotary hoeing. Some growers mistakenly believe that soil loses more moisture when cultivated. But remember that weeds transpire water into the atmosphere every day they are in the field; the longer weeds live, the more soil moisture is lost and unavailable for the crop, and the harder they are to eradicate. So it is always a wise decision to cultivate weeds early on.

- ◆ Cultivate when the weeds are relatively small and the crop is large enough (at least 4 inches tall) to allow you to roll some soil into the row without covering the crop.
- ◆ The crop should be at least three times as tall as the weeds when the first cultivation is done (for example, the crop is 6 inches tall and the weeds are 2 inches or less tall). This way, the weeds in the row can be covered with minimal effect on the crop.
- ◆ The cultivator need not be set any deeper than a couple of inches to dislodge the weeds; little if any moist soil will be brought to the surface.
- ◆ A second cultivation can be done when the crop is 14 to 18 inches tall. This requires timely mechanical practices, but keep in mind that in drought years, a few uncontrolled weeds cost more in reduced yield than in years with ample moisture.

### **Additional resources:**

Your county agricultural agent

### **Related publications:**

UW-Extension publication “Reduced Herbicide Rates: Aspects to Consider,” (A3563).

# Alternative Crops During a Drought

## MEETING FORAGE AND GRAIN NEEDS IN AN EMERGENCY

**Alternative crops can be a major concern during a drought. If planting was postponed or plants didn't survive because of drought, mid-summer planting may be necessary for adequate forage or grain. You also may be concerned about feed supplies for next year and, therefore, wish to plant additional crops this fall.**

**Unfortunately, no one can predict the longevity of a drought. But you do have options, and the knowledge that planning ahead is always a good idea.**

### ALTERNATIVE FORAGES FOR THIS YEAR

Before giving up on existing crops, examine your current crops for silage potential. Corn, for example, may be the best forage alternative available. Also, keep in mind the added labor and cost of establishing alternative crops. Unfortunately, there is no guarantee regarding yield or quality of alternative forages.

- ◆ *Existing crops as alternative forages.* Test these forages and use the data to obtain efficient use through balanced rations:
  - a) alfalfa, red clover, trefoil
  - b) corn and soybeans
  - c) peas or canning crops
  - d) small grains
  - e) grasses
  
- ◆ *Summer-seeded crops.* These generally should be seeded by July 15 and only if moisture is available for germination and emergence. Crops include:
  - a) sudan, sorghum-sudan and forage sorghum
  - b) hybrid pearl millet
  - c) soybeans (alone or mixed with sorghum-sudan)
  - d) 70-day corn
  - e) brassicas - forage rape, turnips
  - f) millets - common, German, foxtail or Japanese
  - g) buckwheat
  - h) winter grain with field peas. These should be planted from mid- to late-August.
  
- ◆ *Alternative cash crops.* If you planted cash crops such as wheat or corn, but drought is causing problems, you may decide to replant. Some good alternatives are buckwheat and millet, which can be planted in July. These are very short season crops and both are high in fiber. Consider whether you have a market to sell these two crops or whether you can feed them to livestock.

### MEETING DEMANDS FOR NEXT YEAR

- ◆ *Spring grains.* If moisture is available for germination and emergence, you can plant spring grains like wheat, oats or barley in August. These can be harvested until a hard freeze, which usually occurs in late October.

- ◆ *Winter rye and winter wheat.* For the earliest harvest of forage next spring, plant winter rye in September. It can be harvested mid-May. Another alternative is winter wheat, which has a higher forage yield but must be harvested seven to ten days later.

## REDUCING THE RISK OF DROUGHT STRESS

The only sure method to avoid drought-stressed crops is to use irrigation. Other management practices, however, can help reduce the risk of drought stress.

- ◆ *Early planting.* By planting early, you increase the chance of having pollination completed before the driest part of the season.
- ◆ *Optimum fertilization.* Proper fertilization will promote healthy plant growth and efficient moisture utilization, essential for high yields in both normal and dry years.
- ◆ *Adequate weed control.* Weeds compete with crop plants for water, so controlling weeds will provide more water for the crop.
- ◆ *Residue management.* By maintaining a cover of residue through conservation tillage or no-till, you can reduce the amount of evaporation from the soil surface and conserve water for the crop's use.

### **Additional resources:**

Your county agricultural agent



# Salvaging Drought-Stressed Crops

## ANALYZING NUTRITIONAL VALUE AND SAFETY

**Drought-stressed crops may often be salvaged, but testing for nutritional value and harmful substances is extremely important. Nitrate toxicity and aflatoxins may be a problem in drought years. Depending on test results, feed amounts need to be adjusted for animal nutrition and safety.**

### **Additional resources:**

Your county agricultural agent

### **Related publications:**

UW-Extension publications—

“Managing Drought-Stressed Corn and Soybeans,” (NCR238);

“Protect Livestock From Nitrate Poisoning,” (A1889);

“Feeding the Dairy Herd,” (NCR346).

## FRESH FORAGE Versus SILAGE

If plants show signs of drought stress, be careful about using them as fresh forage because nitrate levels may be high. A better option is to use plants as silage, because the silage fermentation process reduces nitrate levels. In either case, testing is critical for safe feeding.

Symptoms of nitrate poisoning in livestock include labored breathing, frothing at the mouth and a brownish color of the nonpigmented skin within a few hours after feeding. Abortions can occur; death may occur within an hour in extreme cases.

- ◆ *Silage should be stored at least three weeks before testing and feeding take place.*
- ◆ *Testing is available from private companies and state universities. Contact your county Extension agent for a list of laboratories.*
- ◆ *Have both a nutritional analysis and nitrate test completed on crops. Results will take longer for nitrate tests.*
- ◆ *Test results will help you determine safe feeding amounts, as well as the need for grain and protein supplements.*

## OATS, BARLEY AND CORN

- ◆ *Test drought-stressed oats and barley for nutritional value. They often are reduced to empty hulls or a very light grain. The result is low energy and protein and a limited feeding value for poultry and swine. Oats and barley may work well in combination with beef and other livestock feeds.*
- ◆ *Consult with your livestock nutritionist or agricultural agent about corn use. Corn quality usually is not a concern during drought; corn kernels may be smaller, but feeding value is not affected to the same degree as for oats and barley. Ear corn, however, may be lower in nutritional value due to a higher cob to kernel ratio.*
- ◆ *Test for aflatoxins in grain fields. The fungus, *Aspergillus flavus*, and certain other molds may produce toxic substances in the field and in storage. They historically have been a problem in southern states where severe drought and high temperatures more commonly are experienced. Contact your county agricultural agent for a list of qualified laboratories.*

# Herbicide Concerns After a Drought

## ACCOUNTING FOR CARRYOVER IN NEXT YEAR'S CROPS

**When soils are moist during the growing season, herbicides break down through microbial and chemical processes. These reactions may be slowed greatly in drought conditions. If herbicide residues are significant, they may injure rotational crops in the following season. For this reason, growers need to be aware of herbicide residues and take steps to decrease risk of injury.**

### HERBICIDE CARRYOVER LEVELS

Herbicides vary greatly in soil persistence and carryover to next year's crops.

- ◆ *Essentially no risk.* Herbicides presenting essentially no risk of carryover for next year's crops include: 2, 4-D, Roundup, Gramoxone, Basagran, Poast, Assure, Fusilade, Sutan, Select, Banvel, Clarity, Blazer, Eptam, Eradicane, Lorox, Buctril, Reflex, Cobra, Butyrac, and MCPA.
- ◆ *Moderate risk.* Herbicides presenting a moderate risk of carryover to next year's crops include: Sencor, Lexone, Bladex, Treflan, Prowl, Accent, Beacon, Broadstrike, Velpar, Balan, Stinger, Classic, Pinnacle, Lasso, Dual, Frontier, Surpass and Harness.
- ◆ *High risk.* Herbicides presenting a high risk of carryover to next year's crops include: atrazine, Pursuit, Scepter, Command and Princep.

### AVOIDING RESIDUE PROBLEMS

- ◆ *Check the label of herbicides used during the drought season.* It will tell you the normal interval between application and planting for a specific rotational crop. Footnotes frequently show if the risk of carryover is greater under certain conditions (such as soil pH or dry soils).
- ◆ *Select this year's herbicides carefully.* Do not choose herbicides or use rates that have significant injury potential by themselves. Do not use products that may interact with carryover levels of last year's products. For example, do not use metribuzin (Sencor, Lexone) in soybeans this year if atrazine was used in corn planted during the drought year.
- ◆ *Use tillage.* Tillage will dilute the herbicide, especially if it is concentrated near the surface or in bands over the row.
- ◆ *Look for herbicide tolerance.* Select crop varieties or hybrids with greater tolerance to the herbicide used during the drought year. This information is not available for all varieties. Ask your seed supplier for assistance.
- ◆ *Use good management practices.* Good seedbeds, proper seeding depth and rate, adequate soil fertility, and insect and disease protection will minimize the effect of herbicide carryover. Many crops can tolerate a single stress relatively well, but two or more stresses can result in significant loss of crop vigor and yield.

## TESTING FOR CARRYOVER

If you choose to test for herbicide carryover, the best time to do so is between late October and mid-November for most of Wisconsin. By this time, soil temperatures reach and remain below 50 degrees F., a point at which herbicide breakdown is minimal. Do not take soil samples for residues before this time; they may indicate levels greater than actually present when you plant next year.

- ◆ *A bioassay test may be helpful if doubts remain about planting because of possible herbicide residues.* The test will alert you to residue problems by comparing the productivity of your intended crop variety in both affected and unaffected soils. (Follow the guidelines in the UW-Extension publication “A Simple Test for Atrazine Residues.”) Begin the test at least three weeks prior to planting so that sufficient plant growth is available to assess carryover potential. The herbicide label may also contain suggestions on running a bioassay test, as well as information on crop rotations and carryover potential.
- ◆ *A chemical test for herbicide residues can also be done by private laboratories.* These tests are expensive and the results may not be easy to interpret. However, they may be appropriate in cases where bioassays cannot be done or where high value crops are concerned.

### **Additional resources:**

Your county agricultural agent

### **Related publications:**

UW-Extension publications–

“A Simple Test for Atrazine Residues,”  
(A2882);

“Reduced Herbicide Rates: Aspects to  
Consider,” (A3563);

“Row Crop Cultivators,” (A3483).

# Drought Assistance for Farmers

## SOURCES OF GRANTS, LOANS AND OTHER ASSISTANCE

### ASSISTANCE

**When drought conditions take their toll on farmers, government programs and lenders can make the difference. Some, such as the Agricultural Stabilization and Conservation Service, offer feed-grain programs, while others offer grants and loans.**

**While there admittedly will be some paperwork involved, your efforts will pay off with higher benefits if you apply for a variety of programs early on. Your county Extension office can help determine programs for which you are most qualified. As for your local lenders, start negotiating about potential needs—such as money to buy feed—before drought conditions peak. That way you are not managing in a panic mode and neither are lenders.**

- ◆ *Agricultural Stabilization and Conservation Service (ASCS) Federal Farm Disaster Assistance.* ASCS offers disaster payments and livestock feed assistance for drought-stressed farmers. If you don't plant any of your crop, you may be eligible for the 0/92 program which provides deficiency payments on 92 percent of a producer's base acreage.
- ◆ *Farmer's Home Administration.* FHA offers disaster loans at low interest with affordable repayment terms. It also offers conventional guaranteed loans with low interest rates.
- ◆ *Farm Credit Services.* This farmer-owned credit cooperative offers competitive loans to farmers.
- ◆ *Commercial banks.* Competitive loans are available to farmers.
- ◆ *WHEDA-CROP*, also known as the Wisconsin Housing and Economic Development Authority—Credit Relief Outreach Program. This state program offers farmers low-interest loans originating from banks but guaranteed by WHEDA. See your local lender.

### HOW TO APPLY

See your county Extension office about your options for assistance and the enrollment process. In some cases, Extension agents can use a computerized farm assistance program to quickly determine what programs you are most eligible for.

You may need the following items to apply for a grant, loan or other assistance.

- ◆ An itemized list of losses with your estimate of the repair or replacement cost of each item
- ◆ Copies of federal income tax returns from the last three years
- ◆ Insurance policy
- ◆ A brief history of your farm and ASCS information on farm crop base and assigned yields
- ◆ Personal and business financial statements (income statement and balance sheet), list of bills owed
- ◆ Loan repayment schedule

#### **Additional resources:**

Your county Extension office

# Tax Issues After a Drought

## GUIDELINES FOR CROP LOSS AND LIVESTOCK SALES

**Droughts can wreak havoc for farm families. The good news is that come tax time, you have some options that might make things easier. If you have received federal disaster payments, you may be able to postpone reporting them on your income taxes for a year. Likewise, if you were forced to sell livestock because of the drought, you may be able to postpone reporting gains on the sale for as long as two years afterward.**

**Here are some basic things you need to know. But for the best advice for your situation, see a tax practitioner knowledgeable about farm tax laws and assistance programs.**

### CROP INSURANCE PROCEEDS AND DISASTER PAYMENTS

If you are a cash method farmer, you are allowed to postpone reporting insurance and disaster payments on crop losses by one year under Section 451(d) of the tax code. Generally, this rule applies when crops cannot be planted or are damaged or destroyed by a natural disaster such as a drought or a flood. It applies to all insurance proceeds and to federal payments received for losses due to a natural disaster.

- ◆ *Qualifying for the election.* You must be able to show that under your normal business practice, the income from the crop would have been reported in the year following receipt of payment for it.
- ◆ *Two options for reporting on tax returns.* If you qualify for the exception, you have the option of reporting the payments as income in the year it is received or as income in the following year. Electing to postpone reporting the payment as income covers all crops from a farm. You must file a separate election for each farming business you operate. Separate businesses are defined as those for which you keep separate books and are allowed to use different methods of accounting.

### HOW TO MAKE THE ELECTION

The election must be attached to the return (or amended return) for the tax year in which the payment was received. The statement must include:

- ◆ Your name and address.
- ◆ A declaration that you are making an election under Section 451(d).
- ◆ Identification of the specific crop or crops destroyed or damaged.
- ◆ A declaration that under your normal business practice, the income from the damaged crops would have been included in your gross income for the tax year following the damage.
- ◆ The cause of damage of crops and the dates on which the damage occurred.
- ◆ The total amount of payments received from insurance carriers, itemized with respect to each specific crop and with respect to the date each payment was received.
- ◆ The names of insurance carriers from whom payments were received.

## LIVESTOCK SALES

### THE LIVESTOCK ELECTION

**The election to either roll over the gain or defer it to next year is fairly simple. It is made by not reporting the deferred gain on the tax return and by attaching a statement showing all the details of the involuntary conversion including:**

- ◆ **Evidence of existence of the drought conditions that forced the sale or exchange of the livestock.**
- ◆ **A computation of the amount of gain realized on the sale or exchange.**
- ◆ **The number and kind of livestock sold or exchanged.**
- ◆ **The number of livestock of each kind that would have been sold or exchanged under the usual business practice in the absence of the drought.**

#### **Additional resources:**

Your county Extension office; the Internal Revenue Service, (800) 829-3676, for forms; your local emergency government office; income tax preparers

#### **Related publications:**

UW-Extension publication, "Income Tax Management for Farmers," (NCR002).

IRS Publication 225, "Farmers Tax Guide;"

IRS Publication 334, "Tax Guide for Small Business;"

IRS Publication 547, "Nonbusiness Disasters, Casualties and Thefts."

There are two tax provisions that apply to the sale of livestock because of drought. One allows the taxpayer to roll the gain into the basis of replacement livestock. The other allows the taxpayer to defer reporting the income by one year.

### ROLLING GAIN INTO REPLACEMENT LIVESTOCK

If livestock are sold because of drought conditions, the gain realized on the sale does not have to be reported if the proceeds are used to purchase replacement livestock within two years of the end of the tax year of the sale. This applies to livestock (other than poultry) held for any length of time for draft, breeding or dairy (no sporting) purposes.

The new livestock must be used for the same purpose as the livestock that were sold. Therefore, dairy cows must be replaced with dairy cows. The taxpayer must show that the drought caused the sale of more livestock than would have been sold without the drought conditions. The farmer has a basis in the replacement livestock equal to the basis in the livestock sold, plus an amount invested in the replacement livestock that exceeds the proceeds from the sale. In this case, there is no requirement that the drought conditions cause an area to be declared a disaster area by the federal government.

### DEFERRING INCOME TO NEXT YEAR

If any livestock are sold because of drought conditions, you may be eligible for another exception to the general rule that the sale proceeds must be reported in the year they are received. This election applies to all livestock. This exception allows the taxpayer to postpone reporting the income by one year.

To qualify, the taxpayer must show that the livestock would normally have been sold in a subsequent year. Additionally, the sale of the livestock must have been prompted by a drought that caused an area to be declared a federal disaster area. It is not necessary that the livestock be raised or sold in the declared disaster area. The sale can take place before or after an area is declared a disaster area as long as the same disaster caused the sale.