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CC151 Adjusting to Drought...Choose the Right Cropping Practices

J. C. Swinbank

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Choose the Right Cropping Practices

- Get more moisture into the soil.
- Manage crops for efficient use of soil moisture.

EXTENSION SERVICE - UNIVERSITY OF NEBRASKA
COLLEGE OF AGRICULTURE AND U. S. DEPARTMENT
OF AGRICULTURE COOPERATING W. V. Lambert, Director
Choose the Right Cropping Practices

Periods of drought are a part of the normal climate of Nebraska. Although we can’t prevent drought, we can greatly reduce the damage when it does come. By saving the moisture that falls and adjusting cropping practices to make the greatest use of all available moisture, we can usually prevent complete crop failure and obtain moderate yields from certain crops. Here are some practices that will help you make the best use of soil moisture.

SELECT DROUGHT-TOLERANT CROPS

Plant More Sorghum—Less Corn

During drought or when subsoil moisture is short at planting time, a higher percentage of the crop acreage should be devoted to sorghum and less to corn. Grain sorghums outyield corn in dry years and will tolerate more drought. Forage sorghums, Sudan and millet are likely to produce more silage, fodder or hay than corn under unfavorable conditions.

Plant More Temporary Pasture

If livestock is to be maintained on the farm, pastures provide the cheapest feed. With native and introduced grass pastures seriously depleted, extensive use of temporary pastures may be the only way to retain herds profitably. Sudan and small grains are valuable and productive sources of temporary pasture. Forage sorghums, Sudan and millet will usually produce a good feed crop.

Barley or Oats?

The yields of barley, in pounds per acre, usually exceed those of oats—especially in dry years. In eastern Nebraska oats sometimes have an advantage because of greater insect and disease resistance. In the remainder of the state, barley is preferred to oats in dry years. In a very dry spring, neither of these crops is likely to be profitable.

Early maturing varieties of small grain are preferred because they are more likely to escape summer drought, diseases and excessive heat.

Because of its early maturity, winter barley can often be grown more successfully than spring barley in the southern half of Nebraska. In years when winterkilling is not a factor, winter barley can be expected to outyield spring varieties by 30 per cent. Available varieties of winter barley are not sufficiently winter hardy to be grown in the northern or panhandle areas of Nebraska.

MODIFY CROPPING SYSTEMS AND CROP SEQUENCE

Plant crops in relation to the soil moisture supply at planting time. Allow as much time as possible between crops and practice the best known water conservation measures so as to have as much water as possible stored in the soil at planting time. Check the soil moisture in your field before you plant.

In dry years, corn after wheat produces higher yields than corn after corn because of additional time in the summer and fall for storage of moisture. Weeds must be controlled after harvest in stubble fields—otherwise there will be no accumulation of moisture. Late-planted crops or summer fallow should follow sorghum.

A rotation of sorghum, fallow, and wheat is suitable for dry periods in all of Nebraska except the extreme eastern and northeastern areas or on western Nebraska farms where wheat is the only crop desired. Soybeans can replace part of the sorghum and corn acreage where this crop is adapted.

Delay planting row crops or other warm-season crops as long as possible to take advantage of moisture storage from spring and early summer rainfall.

MANAGE LEGUMES CAREFULLY

Depend on crop residues and nitrogen fertilizers, instead of new seedings of legumes, to maintain the nitrogen level of the soil in a series of dry years. When it becomes necessary to plow up a legume field in a dry year, fallow the ground for several months to store moisture before another crop is planted. Legumes leave the soil very dry in years of subnormal rainfall. Thus, the crop following alfalfa, red clover or first-year sweetclover may have a severe drought handicap until the soil moisture supply is replenished.

Do not plow up old stands of alfalfa in drought years as long as one cutting of hay per year can be obtained.

Allow sweetclover to grow through the second year for early pasture or seed. Leave the sweetclover residue standing through the following winter and early spring in order to build up the supply of moisture in the soil. Then plant to small grain, corn or sorghum the next spring.
When soil moisture conditions return to normal, the seeding of legumes in the crop rotation should again be considered. Legumes are probably of little value as a green manure crop on dryland in the alternate fallow and wheat areas of western Nebraska.

**PLANT GOOD SEED OF RECOMMENDED VARIETIES**

Planting seed of unknown varieties or of questionable quality because it is cheap is false economy.

"Shipped in" feed grain is usually made up of a mixture of varieties—probably unadapted—and is likely to be heavily infested with weed seeds.

Using corn "from the crib" for seed will reduce yields to the level of the old open-pollinated varieties.

Sorghum seeded "from the bin" will result in a great variance of plant type and reduced yields unless the crop was produced on a field well isolated from other sorghums or Sudan grass.

**PLANT AT THE RIGHT TIME**

**Corn**

Midseason planting—for the area concerned—is recommended under normal conditions. In drought periods, however, it is usually desirable to delay corn planting as long as possible. Late-planted corn may get rain before it is severely damaged by summer drought. If planting is delayed beyond June 1 an early maturing hybrid should be selected.

Risk may be spread by planting part of the acreage at a midseason date and the remainder at a late date for the area concerned.

The period of pollination can be extended and some of the benefits of "split date" planting can be accomplished by putting seed of a different maturity range in each planter box. Although these hybrids differ in maturity, both should be adapted to the locality.

**Spring Small Grains**

Spring small grains are cool weather crops and on the average, the highest yields are obtained by early planting. Over a period of years, seeding dates around April 1 have proved best for oats and barley in southeastern Nebraska. Because of seasonal differences, slightly later seeding dates for both crops are necessary in western, northern, and northeastern Nebraska.

**Sorghum**

Sorghum is a hot weather crop. Planting should be delayed until the soil is warm enough to insure good seed germination and quick growth. In most parts of Nebraska this will be in late May or early June. A soil temperature of 68° F. at planting depth is desirable. If good rains come in June, sorghum, Sudan and millet can be planted for forage as late as the first week in July. In eastern Nebraska satisfactory yields of grain sorghums may be obtained from late plantings if early maturing varieties are used.

**ADJUST PLANTING RATES TO SOIL MOISTURE SUPPLY**

**Corn (non-irrigated)**

If the soil moisture supply is deficient at planting time, reduce planting rates below those recommended for normal moisture conditions.

**Recommended Planting Rates for Corn at Different Levels of Soil Moisture (40- to 42-inch rows)**

<table>
<thead>
<tr>
<th>Inches</th>
<th>Eastern</th>
<th>Central</th>
<th>Western</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 foot</td>
<td><strong>20-24</strong></td>
<td><strong>24-30</strong></td>
<td><strong>30-36</strong></td>
</tr>
<tr>
<td>2 feet</td>
<td>17-20</td>
<td>20-24</td>
<td>24-30</td>
</tr>
<tr>
<td>3-4 feet</td>
<td>14-17</td>
<td>17-20</td>
<td>20-24</td>
</tr>
<tr>
<td>5-6 feet</td>
<td>12-14</td>
<td>14-17</td>
<td>17-20</td>
</tr>
</tbody>
</table>

*The total amount of water available for plant use will be governed by soil texture as well as depth. If the soil is very sandy, it will hold a maximum of about 1 inch of water per foot of depth, about 2 inches if medium-textured and about 2½ inches if clay.

**It is questionable whether corn should be planted under these conditions. Summer fallow, sorghums, Sudan or millet is preferable, from the standpoint of crop production. Check ASC requirements for protecting corn acreage allotments.

Listing corn is considered more satisfactory than surface planting under dry conditions. Contour listing will retard runoff and conserve moisture on slopes. It should always be used on terraced land. The stubble mulch method of seedbed preparation and tillage is especially valuable in drought periods for summer fallowing and for row crop and small grain production.
Sorghum

Many grain sorghum fields are planted too thick for satisfactory grain production in dry years. Forage sorghums should be planted thicker than grain sorghums to provide a finer-stemmed crop, but forage sorghums may also suffer if planted at too heavy a rate.

Grain sorghums and forage sorghums should be planted at the minimum recommended rate for your area.

**Recommended Number of Seeds Per Foot of Row for Grain and Forage Sorghums (40- to 42-inch Rows)**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Eastern</th>
<th>Central</th>
<th>Western</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain sorghums</td>
<td>4-6</td>
<td>*3-4</td>
<td>*3-4</td>
</tr>
<tr>
<td>Forage sorghums</td>
<td>8-10</td>
<td>4-6</td>
<td>4-6</td>
</tr>
</tbody>
</table>

* The Norghum and Reliance varieties should be planted at the rate of 4 to 6 seeds per foot of row.

Sorghums should be surface-planted in rows for best results, although listing is satisfactory if surface-planting equipment is not available. Do not plant sorghum seed having less than 85 per cent germination.

Sudan may be drilled for pasture, but row planting gives greater assurance of a crop. Drilled Sudan should be planted at the rate of 15 pounds per acre. Five pounds per acre is sufficient in rows.

**ADJUST FERTILIZER RATES TO SOIL MOISTURE**

Have soil samples tested for phosphate and potash requirements. Most Nebraska soils have enough available potash to produce good crops, but phosphate is often needed for small grains and corn in eastern Nebraska and on sandy or eroded areas elsewhere in the state. Phosphate fertilizer should be applied—even in dry years—when soil tests indicate the need for it.

Nitrogen needs are determined by (a) the crop to be grown, (b) past cropping and fertilization practices, (c) the area of the state concerned, and (d) the soil moisture supply at the time the fertilizer is applied.

Profitable use of nitrogen fertilizer may be limited by the amount of moisture available for the crop. Heavy application of nitrogen fertilizer may depress yields in dry years. On the other hand, starved plants cannot make maximum use of available soil moisture.

Rates of nitrogen fertilizer application, suggested in the following table, are for land on which there has been no legume or manure in recent years.

**Recommended Rates of Nitrogen Fertilizer for Different Amounts of Soil Moisture**

<table>
<thead>
<tr>
<th>If soil is moist at time of application to a depth of:</th>
<th>Apply nitrogen at these rates:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row crop (Corn-sorghum)</td>
<td>Small grains</td>
</tr>
<tr>
<td>Continuous winter wheat</td>
<td></td>
</tr>
<tr>
<td>Spring grains (Oats, Barley, etc.)</td>
<td></td>
</tr>
<tr>
<td>Lbs. per acre</td>
<td>Lbs. per acre</td>
</tr>
<tr>
<td>0 feet</td>
<td>0</td>
</tr>
<tr>
<td>2 feet</td>
<td>0</td>
</tr>
<tr>
<td>4 feet</td>
<td>*20-40</td>
</tr>
<tr>
<td>6 feet</td>
<td>40</td>
</tr>
</tbody>
</table>

* The higher rate applies in eastern Nebraska. The application of nitrogen fertilizer to row crops should be delayed until the last cultivation during dry years.

Nitrogen fertilizer usually is not needed for wheat on good summer-fallowed land in western Nebraska, but may be profitable on eroded or sandy fields in that part of the state.

**CULTIVATE NO oftENER THAN NECESSARY**

Be sure cultivation is needed. Minimum cultivation reduces the loss of water, helps to maintain crop residues, lessens pulverizing, and is less costly.

Cultivate as shallow as possible to remove weeds. Deep cultivation of row crops cuts off plant roots, reducing their ability to absorb water from the soil.

Spraying may be substituted for cultivation where common broad-leaf weeds are the principal problem.

**ADJUST MACHINERY CAREFULLY**

Be sure your planting and cultivating equipment is properly adjusted and in good working order before going to the field. Your operator's manual prepared by the manufacturer gives the necessary instructions. Use it faithfully.

Plates for planting sorghum must be selected with care. Yields of this crop can be seriously reduced by improper planting. A thick stand in a dry year may result in crop failure.
Sorghum plates should have holes that will hold two or three seeds from the seed lot selected for planting. The holes must be well countersunk on the bottom side to prevent sticking of the seeds. Plates must have the number and size of holes required to drop the desired number of seeds per foot of row.

If manufactured plates are not available, it will be necessary to obtain blank plates and drill the holes at home.

In any case, check the planter carefully before going to the field to see that seeds are being dropped at the proper rate. In making this check, be sure to use the seed that you expect to plant.

PROTECT YOUR PASTURES

Native and bromegrass pastures on many farms are seriously depleted by drought and overgrazing. Some grasses may be killed out. Vegetative cover must be restored before these pastures will be productive again. Both rainfall and good management will be needed to restore them.

Bare, overgrazed pastures should be rested and started on the way to recovery by (1) deferring grazing, (2) adjusting stocking rates to fit forage production, and (3) using temporary pastures.

Build up feed reserves of silage, dry fodder or hay to supplement your pastures, as well as to supply winter feed.

This circular is a publication of the Drought Committee of the Nebraska College of Agriculture. It was prepared by J. C. Swinbank, D. P. McGill, Fred Koehler, other members of the Department of Agronomy, and Delbert Lane of the Department of Agricultural Engineering.