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## EC129 Profitable Wheat Production

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THE UNIVERSITY OF NEBRASKA  
AGRICULTURAL COLLEGE EXTENSION SERVICE

July, 1926

Extension Circular 129

## Profitable Wheat Production



UNIVERSITY OF NEBRASKA-LINCOLN



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## Profitable Wheat Production

P. H. STEWART AND D. L. GROSS

More profitable wheat production, rather than greater total production in Nebraska, is the object of this circular. The grower who has the largest acreage of wheat does not necessarily make the greatest profit. High yields per acre usually mean a lower cost and a greater profit per bushel. Wheat of high quality brings additional profits. High yield and quality are usually the combined result of good seed, disease prevention, crop rotations, a well-prepared seed bed, the proper time of seeding, and reasonable care in harvesting, threshing, and storing.

### SEED WHEAT

The first essential of a good crop is good seed. Seed as obtained from the separator is often satisfactory for planting without further preparation. In case weed seeds or trash are present in quantity, these may be advantageously removed by fanning. Altho plump seed may be most desirable, yields are seldom reduced materially thru the use of seed that has been somewhat shrunken thru rust or drought. There is no danger of carrying rust infections on seed which has been shriveled by rust. On the other hand, seed produced in a smutty field should be treated as described later herein. Seed should be free from rye as this lowers the grade and affects the price accordingly. Wheat is not subject to local adaptation changes as is corn, and may be moved any distance provided a suitable variety is obtained.

**Winter Varieties.**—Turkey Red winter wheat is widely grown in Nebraska. Two improved selections of Turkey Red, known as Nebraska No. 6 and Nebraska No. 60, developed by the Nebraska Experiment Station, are extensively grown and give excellent satisfaction. Kanred, a selection of Crimean winter wheat developed by the Kansas Agricultural College is also widely grown. In a five-year test at the Nebraska Experiment Station the average yield of these varieties has been as follows: Kanred, 34.0 bushels; Nebraska 60, 33.6 bushels; Nebraska 6, 33.4 bushels; and Turkey Red, 32.2 bushels per acre. From the standpoint of winter hardiness, milling and baking value, and yield, Nebraska 60, Nebraska 6, and Kanred may be considered of equal value. They are recommended for the winter wheat section of Nebraska. If seed of these varieties is desired and is not available locally, the names of growers may be obtained from County Extension Agents or from the Nebraska Agricultural College at Lincoln.

**Spring Varieties.**— Marquis is probably the best variety of red spring wheat for the spring wheat section of the state. Among the durum varieties, Kubanka, an amber sort, is one of the best. In the western part of the state it is likely that Kubanka and other good durum varieties will outyield the red spring varieties due to better drought and rust resistance. Durum or Macaroni wheat, however, is usually lower in price. Red durum is in less demand on the market than amber durum.

Wherever it will live thru the winter, fall wheat outyields spring wheat considerably and is to be preferred. Winter wheat is gradually spreading northward in the state, particularly in the northwest part. Timely seeding and a well prepared seed bed are important factors in preventing winter-killing.

#### SMUT

It is estimated that the loss to Nebraska wheat growers due to smut in wheat is close to \$2,000,000 annually. This loss is due not only to the actual decrease in yield, brought about by smut infection, but also to the fact that smutty wheat sells at reduced prices on the market.

Smut is much more prevalent in western than in eastern Nebraska. Fields in western counties have been found where as high as 75 to 80 per cent of the wheat heads were completely smutted. Such wheat does not pay for the cutting and when harvested the wheat obtained is of little value on the market.

These losses can be easily prevented by proper seed treatment. The copper carbonate dust method has proved to be the most satisfactory. Two ounces of the dust are mixed with each bushel of wheat by means of a revolving barrel or box, a cement mixer, or a special machine manufactured for this purpose. The success of this treatment depends upon the thoro coating of each kernel with the powder. The machine should be tightly closed during the mixing process to prevent the escape of the powder. Treatment should be done in the open, so that the breeze will carry away any powder which may escape, since the breathing of this material may cause sickness to the operators. Thoro dusting of the seed requires about one minute of mixing for each bushel of grain treated. By treating less than a bushel in each operation, a thoro coating can be more easily accomplished. Copper carbonate in different forms and strengths can be secured from drug



stores, elevators or thru County Extension Agents at a very low cost. Copper carbonate material containing 20 per cent of copper has given as satisfactory results as the stronger material. *Copper carbonate is poisonous and treated seed should not be fed to livestock or used for human consumption.*

### TIME OF SEEDING

The best time for seeding winter wheat varies in different parts of Nebraska. In the eastern part of the state the possible damage by Hessian fly must be taken into consideration. On the whole, seeding as early as possible and still escape Hessian fly infestation seems advisable. In southeastern Nebraska dates for safe seeding, announced by the State Entomologist, should be observed. At the Experiment Station at Lincoln, seeding about September 22 has given the best yields during a period of years. In the western part of the state, wheat is often seeded in August and much of it is seeded in early September. Early seeding allows the wheat to become well rooted, thereby lessening the danger of loss by winterkilling and spring blowing. Early seeding also hastens ripening which often permits the crop to escape adverse weather conditions.

Spring wheat should be seeded as soon as the frost is out of the ground and field work is possible.

### SEED BED PREPARATION

Wheat should have a well pulverized, compact, moist seed bed. Due to soil and climatic variations, methods for obtaining these conditions will vary in different parts of the state. Some important principles, however, may be stated.

**Depth of Plowing.**— Ordinarily, plowing 6 to 7 inches deep is satisfactory. Plowing considerably in advance of the time of seeding may be deeper than if done shortly before seeding. Heavy land should be plowed deeper and usually needs more work than a sandy, friable soil. It is well to vary, from year to year, the depth of plowing on heavy soil in order to prevent the development of a "plow sole."

**Time of Plowing.**— Early plowing for wheat is usually best. This destroys weeds which use the available plant food and moisture, allows time for the soil to settle before seeding time, and permits nitrates to accumulate in the soil. Small grain land which is to be seeded to fall wheat should be cleared as soon as possible to permit early plowing. Where a large acreage of stubble land to be prepared for wheat

necessitates the delayed plowing of a part of it, it is considered worth while to disk a portion at harvest time, to kill the weeds, close the cracks in the soil and prepare it to absorb rainfall quickly. Stubble land disked in this way may be plowed later with satisfactory results.

**Wheat on Corn Land.**— A well cultivated corn field provides a good sub-bed for winter wheat. In sections of the state or during seasons when corn does not blow down, seeding wheat in standing corn is good practice. The labor cost of raising wheat on corn land is relatively low. Experiments at the North Platte Station show a rotation of corn and winter wheat to be the most profitable grain combination.

**Summer Tillage.**— In western Nebraska where wheat is the chief crop, land is sometimes plowed in the late spring or early summer and then worked to prevent weed growth, being seeded to wheat in the fall. This practice is known as summer tillage. Such a system requires two years to produce one crop on a piece of land and is feasible only when land is relatively cheap and wheat the main crop. While it is true that the acreage of corn in western Nebraska is increasing, this crop is not grown nearly so extensively as wheat and a wheat and corn combination on the entire acreage is thus prevented. Summer tillage adds to the safety of farming. At the North Platte Station during a period of years, winter wheat on summer tilled land, which averaged 26 bushels per acre, has yielded 7.3 bushels more than wheat seeded in standing corn. The corn, however, made on the average, 21.1 bushels per acre to offset the 7.3 bushels of extra wheat on the summer tilled land.

**Stubbling in Wheat.**— Wheat drilled back into the stubble of the previous wheat crop is, on the whole, not satisfactory. It is most likely to be successful on weed-free land such as on second year native sod. Excessive weed growth, a shortage of soil moisture, and the unevenness of stand due to volunteer grain, are most likely to make stubbling-in wheat unprofitable.

#### MANURE, LEGUMES, AND FERTILIZERS

Many Nebraska soils are gradually becoming deficient in nitrogen and organic matter. These constituents may be supplied by using manure and growing legumes. Manure applied to winter wheat has increased the yield about 5 bushels per acre at the Nebraska Experiment Station. Light, rather than heavy applications, have been found to be most

beneficial. This is particularly true in the drier parts of the state where a heavy application of manure may cause the crop to burn. In the winter wheat section of Nebraska, manure will probably give greater returns when applied to wheat than on any other crop.

Wheat following clover or alfalfa land normally makes a high yield provided it does not lodge or burn. Forty Nebraska farmers estimated that on their farms 2 years of sweet clover increased the yield of wheat 50 per cent. On many eastern Nebraska farms and in irrigated sections sweet clover is seeded with all small grain. It is then turned under the following spring for corn or other crops, or is left for hay, pasture, or seed production. The use of legumes promotes the keeping of livestock and the production of manure, all of which makes a diversified and permanent type of farming.

In tests in different parts of the state commercial fertilizers containing phosphorus, potassium, and nitrogen have not given profitable returns when applied to wheat or other grain crops. Phosphorus fertilizers have in most cases given slightly increased yields, but not enough to pay for their use. Excepting nitrogen, which we cannot afford to add in the form of commercial fertilizers, phosphorus is most likely to be deficient in Nebraska soils.

#### RATE AND MANNER OF SEEDING

Winter wheat is seeded at rates varying from five pecks per acre in eastern Nebraska to two pecks in the western part of the state. The rate may be varied considerably without affecting the yield appreciably. At Lincoln, five pecks per acre have given the maximum results under normal conditions, while at the North Platte Station three to four pecks have given best results. Late seeded fields should be sown at a heavier rate than early seeded ones, as there will be less chance for stooling. Wheat sown on a poorly prepared seed bed should be seeded somewhat thicker because of less favorable conditions for germination. In the western and northern parts of the state where most of the spring wheat is grown, it is usually seeded at the rate of four pecks per acre.

#### HARVESTING

Wheat should be fully ripe and dry when harvested with the header or combine,—otherwise there is danger of heating and moulding in the stack or bin. Some of the wheat coming to market is graded down on account of heat damage.



Probably the greater part of this is due to the tendency to begin harvesting with combines before the wheat is mature or when the grain is damp from dew or rain. Green patches in a field often cause difficulty when harvesting with a combine or header. Such patches if cut with the remainder of the field may cause considerable damage. This damage can often be avoided when the combine is used by keeping the immature wheat separate. Fields of wheat which contain considerable green wheat or weed patches should not be harvested with the header. Cutting with a binder is advisable under such circumstances.

Binder cut wheat should be shocked soon after cutting. Long shocks should be built if the bundles are not thoroly dry. Otherwise the round shock is satisfactory and usually stands better. Capping is seldom advisable in Nebraska since the caps are likely to be blown off. Wheat should not be left in the shock longer than is necessary for proper curing.

#### THRESHING

Unless the grain is thoroly dry when threshed, it will heat in the bin. There is more danger of this when threshing is done from the shock than from the stack.

The threshing machine should be so adjusted that the wheat comes out fairly clean and free from beards, chaff, and stems. Cracked kernels also reduce the market value of wheat. Wheat containing other grains and foreign material sells at a lower price than clean wheat.

#### STORING

If wheat is dry when stored and placed in weather-proof bins there is little danger of damage, unless it is to remain in the bin for a considerable period. In the latter case precautions against weevil should be taken. Wheat intended for long period storage should be placed in nearly air-tight bins, so that in case weevil should develop, the carbon bisulphide method of extermination can be used. This consists of setting shallow pans of the liquid over the wheat and allowing it to evaporate. The resulting fumes being heavier than air penetrate the wheat. Unless the bin is tightly closed this treatment cannot be used effectively. Precautions should also be taken to prevent contamination of the wheat by rats, mice, birds, etc.