

a 70 day feeding period in a corn field. However, upon marketing the above cattle the cows receiving the protein supplement sold for \$19.00 per hundredweight while the non-protein cows brought \$17.30 a hundredweight. The protein supplemented steers brought \$25.00 per hundredweight, and the 7 steers not receiving the soybean cake \$22.90 per hundredweight. This higher selling price for the protein supplemented cattle resulted from the additional "bloom" shown by them. However, under varied market demands and conditions this "bloom" may not command premium prices. Although the selling price for different lots appears to be an important tool in measuring the difference between lots, the value of this criteria is not significant when the buyers' interests under different market conditions are considered.

Figure 3 reflects the increased body weights of all four lots throughout the 70-day feeding period. It is interesting to note the influence of weather on the different weighing days as it affected individual body weights. Extremes in weather either hot or cold appeared to result in less "fill" and lower weights for all cattle during the week. At the conclusion of the study weights were taken on all cattle before being trucked for West Fargo, a distance of 300 miles from Dickinson. A 5% shrink in body weights resulted between the loading weight and the selling weight.

The amount of corn and protein supplement consumed by the 28 cattle was computed and compared to the difference between the buying and selling price of the cattle after all trucking and other deductions had been made. Considering the deposited manure to have a value equal to the labor of the enterprise, the corn was marketed for \$1.75 per bushel in the field. This study carried out during a period of years should result in valuable data to be used by western Dakota farmers in planning their operations.

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## NORTH DAKOTA PLANTS RELATED TO THE LETTUCE GROUP

by

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This is an easily recognizable group of plants of which dandelion, sow thistle and prickly lettuce are common examples. It is usually considered part of the large group of Compositae which includes sunflowers, asters, thistles and many other species, which have very small flowers grouped into heads. These heads are often thought of incorrectly as a single flower in sunflower and asters (see Sept. 1941 and Sept. 1943 issues of this bulletin). Central flowers of the head have tubular corollas but these are very small. In sunflowers the outer flowers have long, flat corollas, which are frequently referred to as "petals".

In the lettuce group, the corollas are all of the flat, elongated sort. The outer are longer than the inner ones, sometimes much longer. Another feature which is useful in recognizing the members of this group is the milky juice in all parts of the plant of most species. The flowers are most commonly yellow but in a few species they are blue, purplish, pink or lavender.

The fruits of these flowers are commonly called "seeds" because they are small, dry and single seeded (achenes). They are usually rather small, more or less cylindrical, angled or flattened. Another feature which is characteristic of them is the fact that the tuft of hairs (pappus) by which the fruit is carried by the wind, is often on a slender stalk, as illustrated by the ordinary dandelion. The seeds mature quite regularly in about 10 days after flowering.

At least 26 species of this group occur in North Dakota. Several of them are troublesome weeds and some others are native plants of little importance. We have 5 species of lettuce, of which prickly lettuce is a common and troublesome weed. This plant has yellow flower heads exactly like those of the common garden lettuce. The fruits are also similar to those of garden lettuce but greenish-gray in color. They often germinate in early fall and the seedlings live through the winter, beginning to grow vigorously in late April when the weather becomes warm. **Prickly Lettuce** (*Lactuca scariola*) is rather easily recognized at any stage of growth because of the stiff, spiny hairs along the middle of the lower surface of the leaf. These are not so stiff at first and the young stem tips and upper leaves make a fair quality of greens, especially if mixed with other kinds of plants.



Figure 1—**Spiny Sow Thistle.** An annual weed with spiny leaf edges and yellow flower heads about  $\frac{1}{2}$ -in. wide.



Figure 2—**Blue Wild Lettuce.** A native perennial with smooth leaves and purplish blue flower heads about  $\frac{3}{4}$ -in. wide.

**Blue Lettuce** (*Lactuca pulchella*) is another very common species, a perennial which is native to our prairie region. It is one of our most troublesome native weeds because it often increases considerably in fields which are neglected or little cultivated for a year or two. However, it is not very resistant to cultivation. As suggested by the name, the flowers are blue or purplish blue. Unlike most other members of the group, the flower heads remain open all day long. The leaves are dark green, quite smooth, lack the hairs along the lower middle and have scarcely any teeth along the edges.

There are three other native species of lettuce, all biennials, and all of little importance although one becomes quite a large, conspicuous plant in prairies. It has some hairs on the lower middle of the leaf but they are less spiny and more curved than in prickly lettuce. The fruits of all three species are black, quite flat and thin. Those of blue lettuce may be either dark gray or reddish brown. In the latter case, they resemble quite closely the fruits of sow thistle but they are quite rare as impurities of crop seed.

**Perennial Sow Thistle** (*Sonchus arvensis*) is too well known in the eastern part of the State to require description. It seems to do best in moist soil and often appears first on wet ground along edges of ponds where it is difficult to control and from which the seeds blow to surrounding fields. It has not become so common farther west although it may be found in favorable locations. It is rather easily recognized by the fact that it produces a stout stem 3-6 feet high and this bears a number of yellow flower heads, somewhat larger than those of dandelion. It spreads rapidly by irregular, more or less horizontal, fleshy roots.

There are two annual species of sow thistle but for practical purposes these may be disregarded. One is quite rare and is found chiefly about gardens and towns in our area, although it is the one that is called "Common Sow Thistle" (*Sonchus oleraceus*) in most general books on weeds. The other, called **Spiny Sow Thistle** (*Sonchus asper*), has more spiny leaves and is sometimes quite a nuisance around gardens and dooryards.

One quite striking and common member of this group, **Goatsbeard** (*Tragopogon pratensis*), is widely distributed over the State and appears mostly in grasslands and in other uncultivated places. The most prominent feature of the plant is the large seed head, which resembles that of a dandelion but is about 6 inches in diameter when the seeds are ready to scatter. This plant was introduced from Europe quite early and became distributed rapidly by the blowing seeds. It is a biennial and produces the first year a stout root with a tuft of slender leaves 6 to 10 inches long. Since it does not flower until the second year it should not persist in ordinary fields.

Among the native plants of this group, **Skeleton Weed** (*Lygodesmia juncea*) is a common perennial from deep roots and sometimes is abundant on dry knolls or in fields where the soil is light. This plant is almost leafless. The flower heads are pink and each one is born at the very tip of a branch. One peculiar feature, which frequently attracts attention,

is the production of clusters of rounded bodies about  $\frac{1}{4}$  inch in diameter on the lower parts of the stems. These are galls caused by a small insect somewhat related to the ants. The eggs are deposited in the young plant stems where the growth of the larvae irritates the tissues of the plant causing it to produce these abnormal growths. The insect remains in these over winter and emerges the next spring.

One rather showy but unimportant member of the group is **Hawks-beard** (*Crepis runcinata*) which is found in prairie sloughs where the soil is usually well supplied with water. Here it produces masses of yellow flower heads during the latter part of June. The leaves are mostly in a cluster near the ground but the branches reach a height of one to two feet. Another native species, *Agoseris*, grows much like a dandelion but the leaves are narrow and often without any teeth along the edges. It seems to grow quite often in patches and sometimes is conspicuous on lower prairies. It blooms mainly the latter part of June but may continue until late fall.

## THE EFFECT OF THREE 2,4-D COMPOUNDS ON YIELD AND QUALITY OF NORTH DAKOTA WHEATS

by

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Some plants give varying degrees of reaction to 2,4-D at different stages of growth. Some reports from farmers have been highly favorable regarding the crop reaction to the application of these compounds, while others report unsatisfactory effects—principally reduced yields.

### Part I. Effect of Dates of Application

An experiment to test the reaction of the wheat plant to the application of a standard amount of 2,4-D, at various stages of growth is described in this section.

This experiment was designed to establish the stages of growth at which wheat can be most safely treated with 2,4-D. Mida wheat,<sup>4</sup> a variety widely grown in this area, was selected as the test crop.

Three different commercial 2,4-D formulations were used: (1) 40% butyl ester; (2) 40% alkanolamine salt; and (3) a 83.5% sodium salt. These were applied in a water solution, using a 3-gallon knapsack sprayer, at the uniform rate of 16 ounces of 2,4-D acid per acre, using 80 gallons of solution per acre. Applications were made at the full tiller, boot or shooting, blooming and soft dough stages.

Four replications of each treatment at each stage of growth were used, and blocks as well as treatments within the blocks were randomized. Three rows, 18 feet long and 1 foot apart, were used for each replication. These were planted with a "Columbia" nursery seeder at the rate of 15 grams of seed per 18-foot row. A 2-foot alley separated the blocks and four guard rows surrounded the entire planting.

<sup>1</sup>Progress report on State project on "Chemical Control of Annual Weeds".

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<sup>5</sup>Weaver, Robt. J., Swenson, Carl P., Ennis, W. B., and Boyd, F. T. Bot. Gaz. 107; 563-568. 1946.