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F. V. Pumphrey

F. E. Koehler

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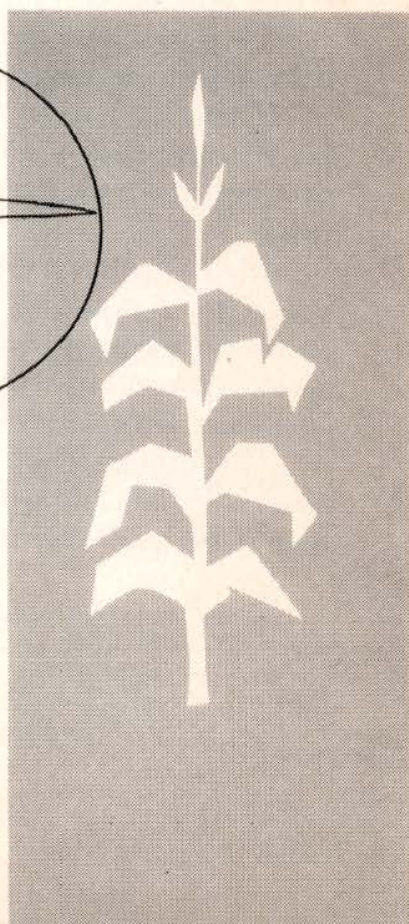
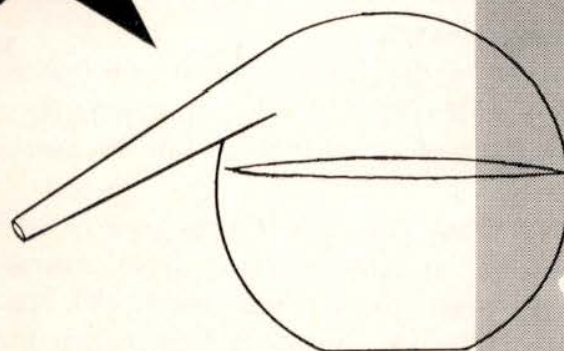
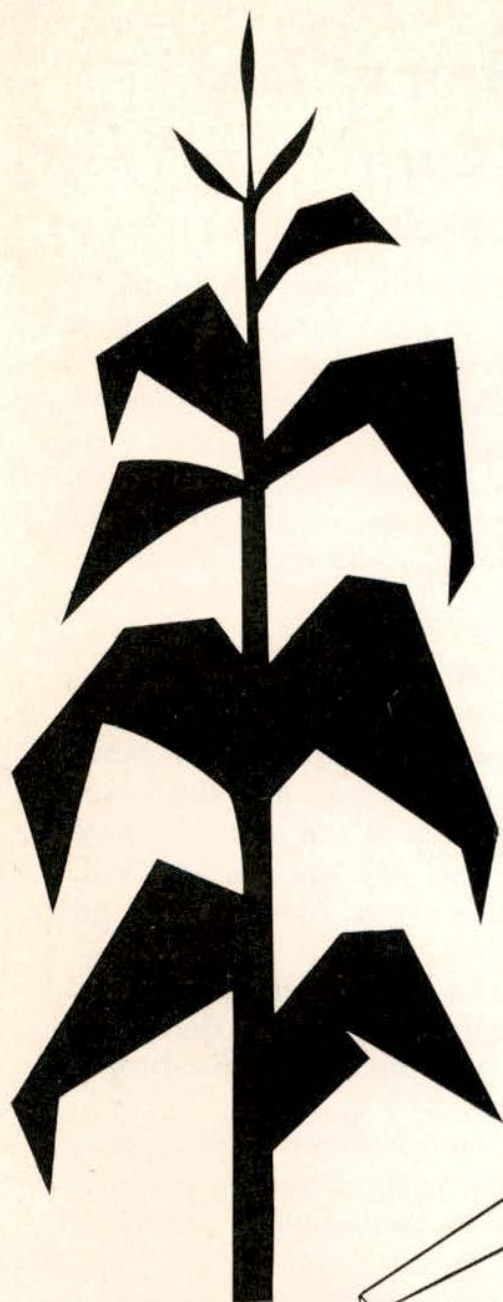


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Symptoms and Control of Zinc Deficiency in Corn

F. V. PUMPHREY AND
F. E. KOEHLER



THE EXPERIMENT STATION
OF THE UNIVERSITY OF NEBRASKA
COLLEGE OF AGRICULTURE
W. V. LAMBERT, DIRECTOR
E. F. FROLIK, ASSOCIATE DIRECTOR

Symptoms and Control of Zinc Deficiency in Corn

F. V. Pumphrey and F. E. Koehler¹

Zinc has long been recognized as an element essential to plant growth. Only small amounts of zinc are required for normal plant growth; thus, zinc is considered a trace element. Recently, research workers have learned that one type of yellowing (chlorosis) observed in corn leaves in Nebraska is caused by a deficiency of zinc. The purpose of this publication is to describe zinc deficiency symptoms in corn and to present recommendations for applications of zinc fertilizer. Experimental data on yield increases and chemical analysis will be presented in technical publications.

How to Recognize Zinc Deficiency in Corn

Zinc deficiency symptoms in corn occur in a characteristic sequence and are reasonably easy to recognize and distinguish from other chlorosis. When corn plants are two or three weeks old, the lower leaves develop a pale yellow stripe on each side of the midrib. These pale yellow chlorotic stripes start at or near the base of the leaf. Usually the margin and the midrib remain green. (See drawing on opposite page.)

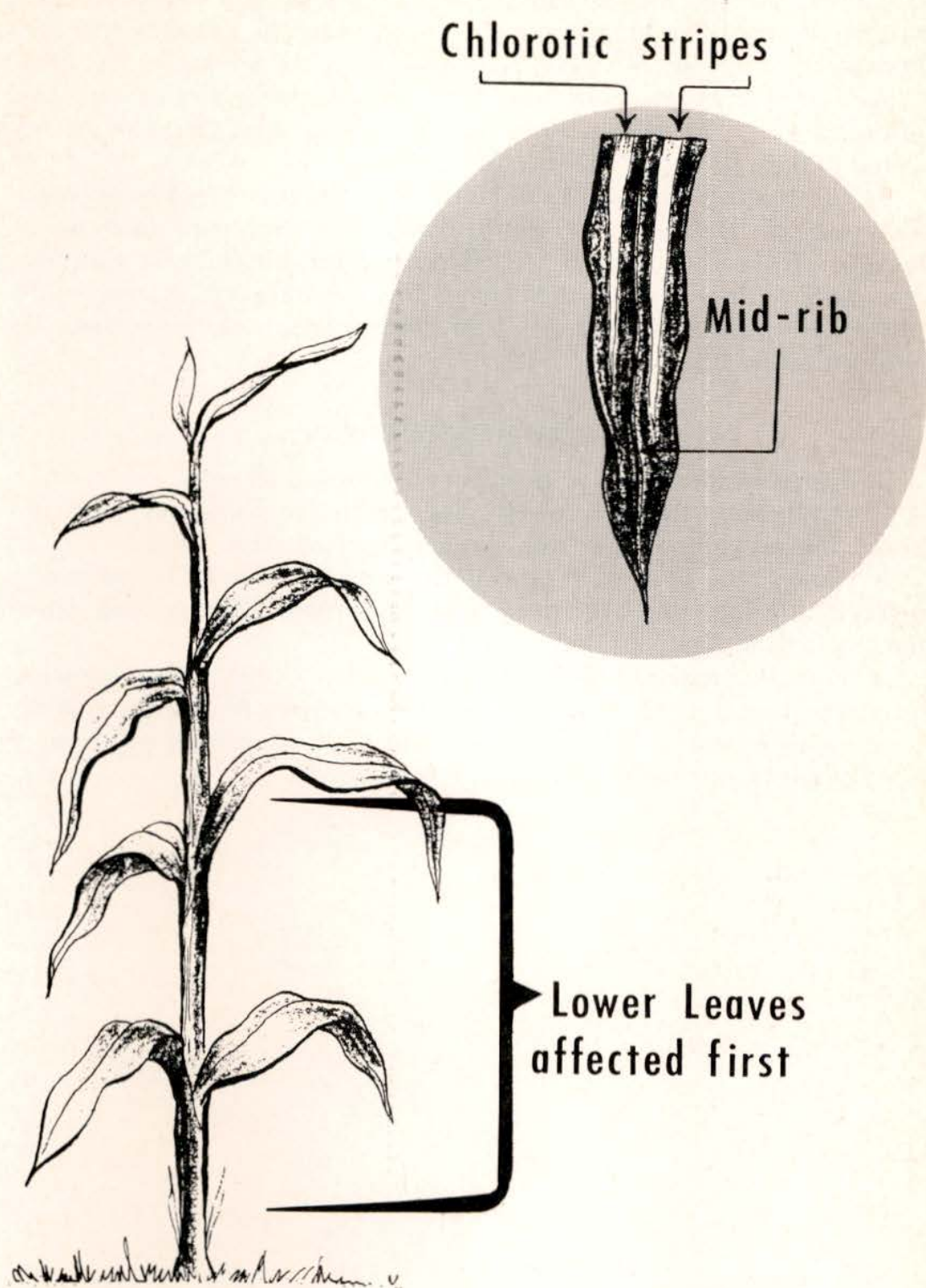
Part or all of the chlorotic area of seriously deficient leaves may either die or become reddish-bronze in color. Thus, zinc deficiency can be recognized by both the pale yellow striping and reddish-bronze coloring in the lower leaves.

If zinc deficiency is mild, only the lower leaves of the plant may be affected and new leaves will develop normally. Bronzing may not develop and stunting of growth may not be noticeable by tasseling time.

Corn plants vary extremely in the degree to which they show zinc deficiency symptoms. In very deficient areas almost all plants will be chlorotic when no more than three weeks old. In areas where mild deficiencies occur, only one plant in five or ten may show symptoms and then only when the plant is 1 to 2 feet tall.

The influence of zinc deficiency on yields can be estimated from observing the intensity of the chlorosis. Severely deficient plants often die; if they survive, they are stunted and possibly barren. Ears from

¹ At the time this publication was written, F. V. Pumphrey was Assistant Agronomist, and F. E. Koehler was Soil Scientist, Agricultural Research Service, U. S. Department of Agriculture. Both were stationed at the Scotts Bluff Experiment Station, Mitchell, Nebraska. F. V. Pumphrey is now Assistant Agronomist, Oregon State College, and F. E. Koehler is Associate Soil Scientist, State College of Washington.



Young corn plant

years if the zinc remained available for plant use. Zinc in zinc sulfate will slowly become unavailable to plants. Not enough work has been completed to answer the question as to how fast the zinc reverts to an unavailable form in different Nebraska soils. Observation has been made that zinc applied one year supplied adequate zinc to corn the following year. Results in other states indicate that zinc can be expected to have several years of residual value.

In the North Platte Valley of Nebraska corn grown following sugar beets may be zinc-deficient. An application to the corn of 5 or 10 pounds, either broadcast or side-dressed with nitrogen at planting time, will relieve the zinc deficiency. This application of zinc could possibly supply the zinc needs of all crops through the next time the field is in sugar beets.

RECOMMENDATIONS

1. Learn to identify zinc deficiency symptoms in corn.
2. Apply zinc to fields where zinc deficiency symptoms were observed the previous year if zinc was not applied then.
3. Apply 5 to 10 pounds of available zinc per acre by broadcasting and working into the soil before planting, or side-dressing with nitrogen at planting time.
4. For emergency application, which is applying zinc to growing corn, side-dress 5 to 10 pounds of zinc per acre with 10 or more pounds of nitrogen per acre. Wetting the leaf area by spraying a solution of 1 or 2 per cent zinc sulfate is also beneficial.