PROGRESS

of the

Barberry Eradication Campaign

in

NEBRASKA in 1929

Our Grain Crops Must Be Protected from Black Stem Rust

Barberry Eradication Pays

Remove the Barberry and Break the Rust Cycle

Spring

Cluster Cup Stage of Rust on Barberry Leaf

Barberry Bush

Winter

Black Stage on Straw, Stubble and Wild Grasses

The Life Cycle of Black Stem Rust

The World's Most Destructive Disease of Wheat, Oats, Barley and Rye

Summer

Red Stage of Rust on Growing Grain. Repeats Every Ten Days

Harvest Time

Black and Red Stages of Rust on Mature Grain

All Common Barberries act as starting points for Black Stem Rust early each spring. By destroying the barberry the early spring source of black stem rust is eliminated. The Common Barberry provides a means to bridge the gap between the black stage on grain in the fall and the red stage of the rust on grains and grasses the following spring.

BOOST BARBERRY ERADICATION—A PRACTICAL RUST CONTROL MEASURE

PROGRESS OF THE BARBERRY-ERADICATION CAMPAIGN IN NEBRASKA, 1929

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United States Department of Agriculture

Introduction

Black stem rust is one of the most destructive diseases of small grains. It causes enormous losses each year to the grain growers of the United States. The average loss in dollars from this source for Nebraska is estimated at about $2,437,000 annually.

The common barberry is an aid to stem rust of wheat, oats, barley, rye, and 75 of the wild and cultivated grasses. The results already obtained in many of the 13 States in the barberry-eradication area indicate that in communities where barberries have been completely eradicated, stem-rust losses have been materially reduced.

Organization and Personnel

The barberry-eradication campaign in Nebraska has been directed by a State Leader with headquarters at the Agricultural College, Lincoln, Nebr. His work is supervised by the Office of Barberry Eradication, 1/ in cooperation with the Nebraska Agricultural College Extension Service. The Conference for the Prevention of Grain Rust at Minneapolis, Minn., composed of representatives of agricultural and allied interests, cooperates in the campaign.

Eighteen field agents were employed in Nebraska for a period of three and one-half months during the past summer. They were trained in a barberry-eradication school under the supervision of the State Leader before they began work. As a rule the field agents have had from two to four years of college training and have made a special study of plants.

Financing

Most of the funds for the barberry-eradication campaign have come from the Federal Government. A majority of the States in which the work is being carried on have had State appropriations to support Federal funds. In Nebraska all of the funds come from the Federal Government, with the exception that considerable indirect aid has been given by the

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1/ From the beginning of the campaign in 1918 until January 1, 1930, barberry eradication was a project of the Office of Cereal Crops and Diseases, of the Bureau of Plant Industry. On January 1, 1930, the Office of Barberry Eradication was established as a separate unit of the Bureau.

Nebraska Agricultural Experiment Station, the Extension Service, and other organizations.

The total cost of finding and destroying 134,217 barberry plants in Nebraska in the past 12 years has been less than $0.005 per acre. On the other hand, a conservative estimate of the annual stem-rust losses in Nebraska would be more than $0.62 per acre for the same period.

All Known Methods of Rust Control Must Be Employed

While barberry eradication is of first importance, there are several known methods of reducing losses due to black stem rust. Early sowing of grain, preparation of the seed bed, avoidance of low, poorly drained land, proper use of fertilizers, in fact, anything that promotes early ripening of the grain, will help reduce the danger from rust.

Certain varieties of wheat, oats, and barley that are more resistant than others have been produced by the plant breeders. Wherever these varieties meet the requirements of a given region and are desirable from the standpoint of yield, milling quality, and resistance to other cereal diseases, they should be substituted for the less satisfactory varieties

New Strains of Destructive Black Stem Rust Develop on the Common Barberry

The production of rust-resistant varieties of grains probably will be much more successful, however, when all common barberry bushes have been eradicated. The reason for this is shown in the recent important discoveries made in the Canadian Rust Research Laboratories at Winnipeg and by E. C. Stakman and his coworkers at the University of Minnesota. Both of these groups conducting independent research have proved that entirely new strains of the destructive black stem rust are produced if two different forms of the rust cross-breed on the barberry leaves. The certainty that new forms of the dangerous disease may appear suddenly, makes the eradication of the common barberry all the more imperative, since it is on the barberry alone that this crossing can occur in nature. The new and apparently resistant varieties of grains are not safe with barberries near. If for no other reason than to protect the new kinds of superwheat that are now in the process of being developed, all common barberry bushes should be destroyed.

Summary of Surveys, 1918-1929

First Survey

The first survey for the common barberry in Nebraska began in the spring of 1918 and was completed in the fall of 1923. Farmsteads were visited, and the vegetation around the farm buildings was searched for common barberry bushes. No inspection was made of adjacent groves, orchards, fence rows, or native woods, unless fruiting barberry bushes were

BLACK STEM RUST SPREADS FROM COMMON BARBERRIES

to Wheat, Oats, Barley, Rye and other Grasses.

Black Stem Rust as it appears on the leaves of the Common Barberry

Enlarged single leaf

Plump healthy grain

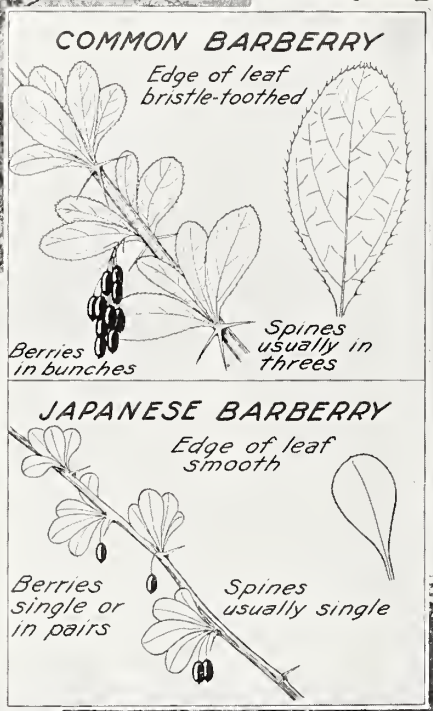
Shriveled rusted grain

DANGEROUS NEIGHBORS

Common Barberry Bushes growing near grain fields

Report Common Barberry bushes you may find to your State Leader of Barberry Eradication.

Common Barberry is harmful, destroy



Japanese Barberry is harmless, do not destroy

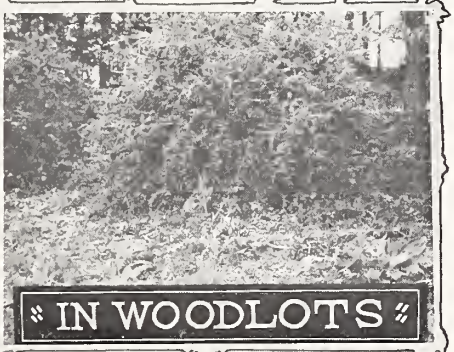
FLOWERS
(*yellow*)

Where Barberry Bushes Grow

BERRIES
(*bright red*)

" IN DOORYARDS "

BIRDS CARRY BARBERRY SEEDS SEVERAL MILES, DROPPING THEM AMONG ROCKS AND IN OUT-OF-THE-WAY PLACES



" IN WOODLOTS "

ON ROCKY HILLSIDES

AS HEDGE FENCES

Barberries spread by birds

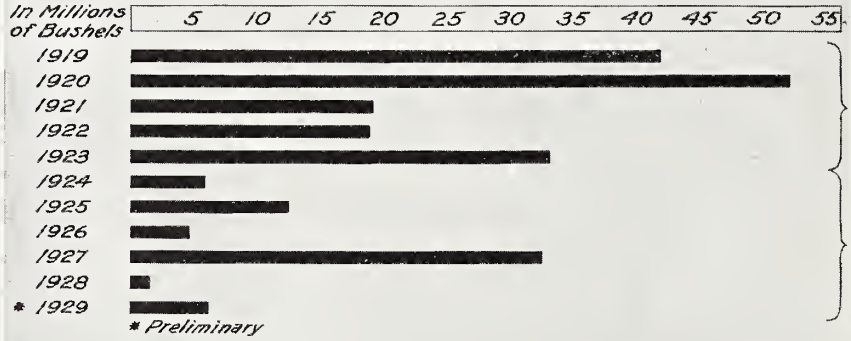
" UNDER OTHER " SHRUBS and TREES

Salting a bush

Sprouts from a dug bush

Common Salt Kills Barberry Bushes and Prevents Sprouting

Wheat Losses in Barberry Eradication Area, 1919-1929

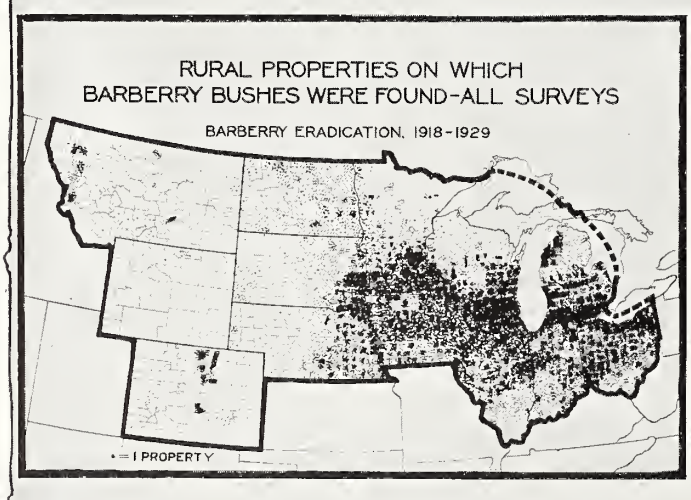


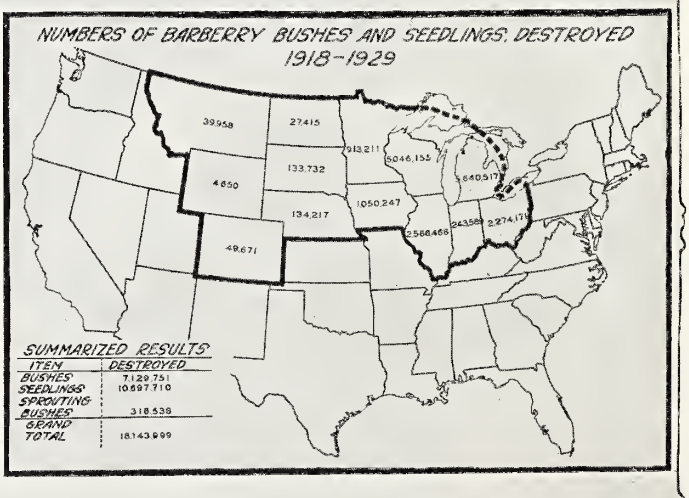
The average annual loss for the first five year period, 1919 to 1923, was approximately 33,000,000 bushels.

The average annual loss for the next six year period, 1924 to 1929, was approximately 10,500,000 bushels.

The losses to small grain crops caused by black stem rust have been reduced since the beginning of the barberry eradication campaign in 1918. The breeding of rust-resistant varieties, the use of early maturing varieties, and the sowing of crops early, have aided barberry eradication in this reduction.

"BARBERRY ERADICATION PAYS"





Prepared by the Rust Prevention Association, 300 Lewis Building, Minneapolis, Minn., in co-operation with Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C.

found on the farmstead. It took six years to complete this survey, and in this period approximately 89,712 barberry bushes were found on approximately 3,619 properties. In this rapid survey, a large number of bushes were destroyed, thus preventing rust spreads and eliminating the possibility of further seed distribution

Second Survey

The second survey, a more intensive type of survey, has been in progress since 1923. It is the second property-to-property survey of all the cities, towns, villages, and farms in each county. On the first survey only barberry bushes planted near the farm buildings were found and destroyed. No attempt was made to locate those bushes which had escaped cultivation. In the more intensive second survey a careful search for barberry bushes is made in orchards, native woods, planted groves, and fence rows.

The second survey has been completed in 36 counties, and 7,263 barberry bushes and 9,133 seedlings have been found and destroyed on 488 properties. (See map,).

Resurvey

A resurvey is a reinspection of properties on which barberry bushes were found on previous surveys. This resurvey is necessary to destroy sprouting bushes and new bushes that may have come up from seeds scattered by birds and other agencies. A resurvey is made whenever necessary. As a result of this activity, 16,951 sprouting bushes have been found and destroyed since the beginning of the campaign.

Summary of All Activities, 1929

Surveys

The major phase of the barberry-eradication campaign for 1929 was second survey. During three and one-half months of the summer 17 field agents made an intensive survey of Kearney, Buffalo, and Howard Counties, one-half of Hall County, and one-fourth of York County. An intensive farm-to-farm resurvey was made of the remaining three-fourths of Cuming County. As a result of all survey activities in 1929, 520 barberry bushes and 891 seedlings were found on 53 properties.

Educational and Publicity Activities

Educational and publicity activities were emphasized in 1929. The objects of the first activity are (1) to teach pupils and students in schools the distinguishing characteristics of the common barberry and its relation to black stem rust, and (2) to obtain from them reports on the location of all bushes that they may find. Barberry literature, stem rust specimens, rusted barberries, and study plans were supplied to 2,219 educational institutions.

One hundred fifty-seven news articles were published in daily and weekly newspapers, and articles were sent to local journals and the press associations. In 1929 approximately 15,816 bulletins, 5,180 circular letters, 6,657 pieces of mimeographed material, 22,190 miscellaneous pieces, and 1,600 progress reports were sent to schools, farmers, and other interested persons. A demonstration was conducted at the State Fair, and displays were placed in 10 store windows.

Investigations

A stem-rust survey was made of the entire State early in the summer. Daily observations were made to determine the first appearance of rust on barberries, the spread of rust from barberries, and the first appearance of black stem rust not directly traceable to barberries. These observations usually begin the last week in April and continue until harvest. The Plant Pathology Department of the University of Nebraska cooperates in making a study of the physiologic forms of stem rust of wheat. More than 317 rusted specimens were collected from representative sections of Nebraska and Kansas for study in the winter months.

Rust Spreads from Barberries

Every year instances have been found of the spread of black stem rust from barberries to grains and grasses. A few of the cases have been mapped and placed on file in the office at Lincoln. No maps showing rust spreads were obtained in 1929, because no barberry plantings were found early in the season and no known locations were left from the previous season from which studies could be made.

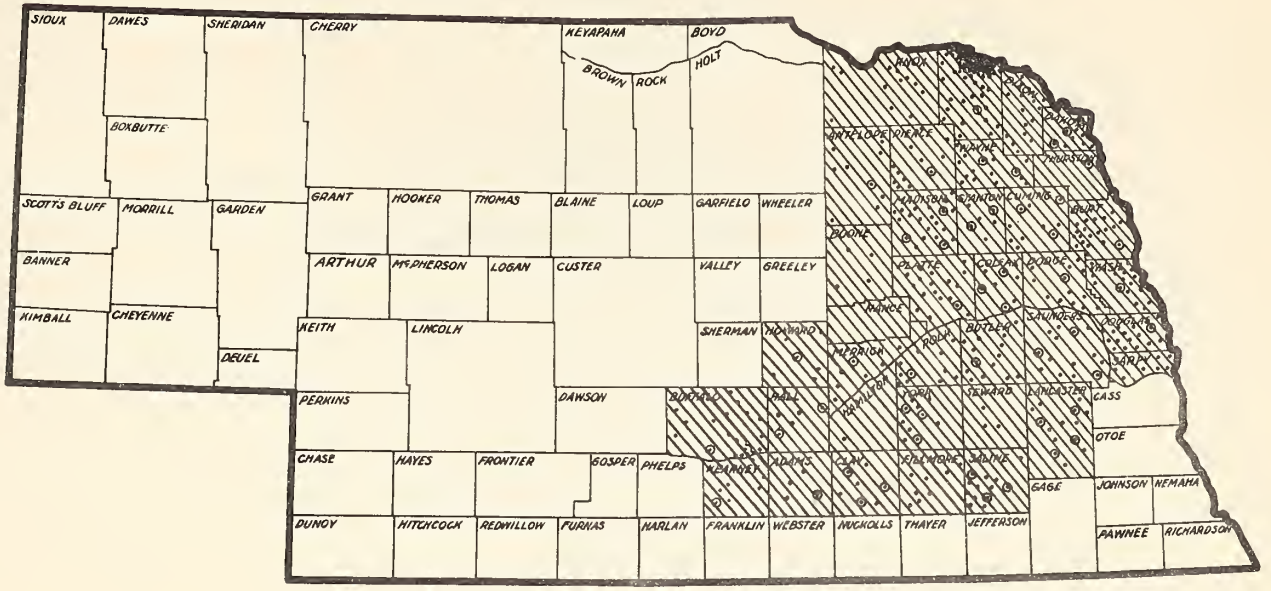
Conclusions

The common barberry is necessary for the completion of the life cycle of black stem rust. It spreads rust to wheat, oats, barley, rye, and many of the grasses.

Seeds scattered from fruiting bushes by birds and other agencies are a source for further distribution of this shrub.

Every citizen of the State should assist the authorities in eradicating this menace by reporting the location of all barberry bushes to the Barberry Eradication Office, Agricultural Experiment Station, Lincoln, Nebr.

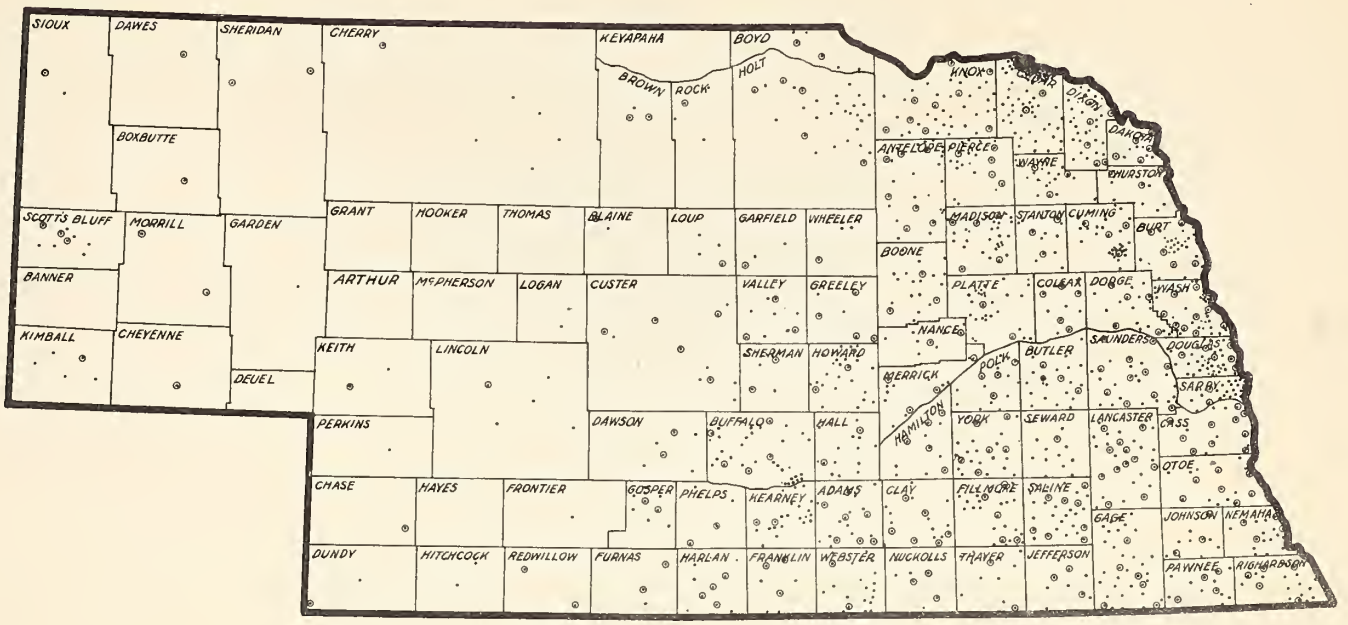
COUNTIES COVERED IN SECOND SURVEY AND THE APPROXIMATE LOCATION OF BARBERRIES FOUND
1922–1929
NEBRASKA



▨ AREA COVERED IN SECOND SURVEY
• FARMS HAVING BARBERRY BUSHES
◉ TOWNS HAVING BARBERRY BUSHES

PROPERTIES HAVING BARBERRY BUSHES 1918-1929

NEBRASKA



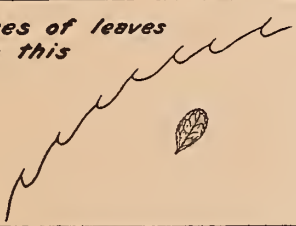
4,211 PROPERTIES
134,217 BUSHES

· FARMS HAVING BARBERRY BUSHES
° TOWNS HAVING BARBERRY BUSHES

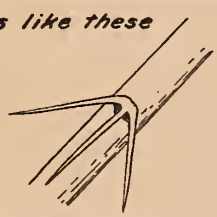
Common Barberry Spreads Black Stem Rust

When you find a spiny bush with-

Edges of leaves like this



Spines like these



Berries like these

Inner bark yellow

It is a **Common Barberry** and should be reported at once

Know Common Barberry

Look For It!

Spread of Barberries by birds

Birds eat the berries

Carry them to their roosting places

Where they cough up the seeds

From which seedling bushes grow

They in time bear fruit which is again carried farther on

Look For and Report All Common Barberry Bushes

To the State Leader of Barberry Eradication, in care of your State Department of Agriculture or your State Agricultural College.

Common Barberry Bushes

spread

Black Stem Rust

to

WHEAT, OATS,
BARLEY, RYE,
and Many Wild
Grasses

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