

# NUGAINES

O. A. VOGEL, K. J. MORRISON, AND C. J. PETERSON, JR.

Nugaines is a semidwarf white winter wheat released for use in Washington and other parts of the Pacific Northwest where Gaines, which it closely resembles, has proved to be well adapted. Outstanding superior characteristics of Nugaines are improved test weight per bushel and milling properties. The variety has a bearded, common-type head with white chaff. The kernels are classed as soft white. The head grows slightly more erect than Gaines.

Nugaines is not as winter-hardy as McCall or Wanser hard red winter wheats, but is slightly hardier than the club wheats. Nugaines is similar to Gaines in hardiness.

## DISEASE RESISTANCE

Nugaines has good mature plant resistance to stripe rust. It also has more stripe rust resistance than Gaines, but less than Moro. Nugaines, like Gaines, is susceptible to stripe rust in the seedling stage. Nugaines has resistance to some races of leaf rust. It is as susceptible to footrot and rootrot as other varieties, but lodges less than tall varieties when infected by rootrot organisms. Like Gaines, Nugaines is susceptible to snow molds.

Nugaines is similar to Gaines in resistance to all known races of common smut and most races of dwarf smut. Nugaines has moderate resistance to flag smut and stinking smut.

## SHATTERING AND THRESHABILITY

Nugaines is shatter resistant. It is fairly easy to combine and thresh. However, in high-yielding fields, it is necessary to operate the combine at low speed to reduce seed loss. Combines, unless specially modified, do not have the separating capacity to handle a full header cut at normal ground speed in high-yielding Nugaines fields.

## MILLING AND BAKING QUALITY

Nugaines is better than Gaines in milling properties. It has similar pastry quality. Nugaines does not mill as well as Omar or Moro club wheats.

Baking tests have shown that Nugaines flour

has good quality for pastries, cookies, and soft white wheat products. Nugaines is not suitable for making bread.

## RECOMMENDED AREAS

Trials in Washington, Oregon, and north Idaho have shown that Nugaines is adapted to a wide range of conditions. Nugaines is suited to the Pacific Northwest wheat areas where Gaines has been grown successfully.

Nugaines, like Gaines, uses nutrients and moisture more efficiently than do other wheats in the high-producing areas. (See table 1.)

Table 1. Average yields of Nugaines and Gaines in 7-year trials at Pullman, Pomeroy, Walla Walla, and Dusty\*

Location	Yield, bu/acre	
	Nugaines	Gaines
Pullman—Early (Sept. seeding)	80.8	80.6
Plus 60# N applied in early spring	91.7	89.4
Pullman—Late (Oct. seeding)	74.5	71.4
Plus 60# N applied in early spring	83.7	78.6
Pomeroy—Hillers fall seeding	58.0	57.4
Plus 60# N applied in early spring	68.5	69.0
Pomeroy—Housers fall seeding	64.9	68.8
Plus 60# N applied in early spring	73.5	71.1
Walla Walla fall seeding	73.4	71.4
Plus 60# N applied in early spring	77.8	76.4
Dusty fall seeding	55.2	57.8
Plus 60# N applied in early spring	60.0	58.5
Average fall seeding	67.8	67.9
Plus 60# N applied in early spring	75.9	73.8
Average, all trials	71.8	70.8

\*In each comparison, fall seeding got whatever fertilizer the farmer applied.

When managed properly, Nugaines comes closer to producing the potential maximum for the soil and climate than Gaines or other commercial wheat varieties in the medium to high rainfall areas.

## MANAGING NUGAINES

*Seeding* Nugaines can be seeded 1 to 3 weeks earlier in the fall than standard height varieties with less danger of lodging in the high rainfall areas.

Nugaines, like Gaines, does not emerge as well as Omar, McCall, Moro, or Wanser.

Nugaines requires good soil moisture for germina-

tion and emergence from deep seedings made in early fall. It can emerge through 3 to 5 inches of dry soil if the seed is placed in good moisture and the soil does not crust. Nugaines is similar to Gaines in deep seeding characteristics. In early seedings at high soil temperatures (above 70-75 F), Nugaines may germinate very slowly. The seed tends to be dormant at high temperature but this varies with the conditions under which the seed lot matured. Seed lots to be used in early seedings should be given a high temperature (90 F) germination test to determine which lot will be the most suitable for the warmest seedbeds. A high temperature test is available at the Seed Laboratory at Washington State University, Pullman.

In late fall seedings at shallow depths, Nugaines emergence is good.

Nugaines should be seeded at the same rate as other varieties—45 to 60 lb/acre when seeded early (e.g. September 20 at Pullman or August 20 at Lind). Seeding rate of late seedings should be increased by 25%. Seed should be treated with hexachlorobenzene (HCB) at 2 oz/100 lb of seed or with other effective seed treatment materials at the manufacturer's recommended rate. Seed treatment will hold down the development of new smut races on Nugaines.

Treatment for wireworms is a good investment when Nugaines is seeded late.

#### DO NOT FEED TREATED SEED.

*Fertilization* Nugaines, like Gaines, breaks dormancy earlier in the spring than Omar and most other varieties. With a well-balanced fertilizer program, plants tiller or stool adequately.

Nugaines produces economic returns from high-fertility levels. However, about 25% more nitrogen should be used for Nugaines than for standard height varieties in the high-producing areas. Lack

of sulphur could limit production in some areas; therefore, applications of sulphur may be profitable in deficient fields. Phosphorous and potassium should be added to the soil when soil tests indicate a need for these elements.

*Weed Control* Nugaines starts growing early in the spring and therefore is highly competitive with most weeds. Because of the short straw, Nugaines seeded late may not compete with cheatgrass as well as tall-strawed varieties. At present, no chemicals are recommended for controlling cheatgrass in established stands of wheat. Cheatgrass must be controlled by tillage and crop management before Nugaines is seeded.

Nugaines appears to be as tolerant to 2,4-D as other wheat varieties.

### DEVELOPMENT OF NUGAINES

Nugaines was developed in cooperative investigations by Dr. O. A. Vogel, Research Agronomist, Crops Research Division, Agriculture Research Service, U.S. Department of Agriculture, at Washington State University. The variety was tested in Washington, Oregon, and Idaho.

In 1965, Foundation seed was released cooperatively by the Crop Research Division, ARS, USDA; and the Washington, Oregon, and Idaho agricultural experiment stations and the Crop Improvement Associations of the three states.

The original cross of Norin-10, a Japanese semi-dwarf wheat, and Brevor was made at Pullman in 1949. A selection from crosses involving Orfed and Brevor was then crossed with Burt. Selection for the variety was made at Pullman in 1960.

Gaines was named in honor of the late E. F. Gaines, cerealist at Washington State University from 1913 to 1944. Nugaines was named as an improved form of Gaines.

### THE AUTHORS

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