



& USDA

Bulletin B-566

November 1960

Tonka Oats:

A NEW SPRING - SOWN VARIETY
FOR OKLAHOMA

**Agricultural Experiment Station
Oklahoma State University, Stillwater
and
Crops Research Division
Agricultural Research Service
U. S. Department of Agriculture**

Tonka Oats

B. C. Curtis, A. M. Schlehner and R. M. Oswalt
Department of Agronomy

Tonka oats, developed by the Oklahoma Agricultural Experiment Station and the Field Crops Research Branch of the U.S.D.A., is a true spring oat that matures early and produces good yields of exceptionally high test weight grain. It is moderately resistant to barley yellow dwarf, a virus disease which has recently caused widespread damage in the major oat producing areas of the United States.

Tonka is considered to be a better variety than any of the true spring oat varieties now recommended for Oklahoma. It is expected that Tonka will be grown in all areas of Oklahoma that produce spring oats.

Origin and History

Tonka (C.I. 7192) originated as an early maturing pure-line selection from a field of breeder's head rows of Clinton (C.I. 3791) made at the Oklahoma Agricultural Experiment Station in 1946. The strain was reselected in 1948 and again in 1950. The exact pedigree of Tonka is not known; however, it probably resulted from a natural cross of Clinton and some other variety, since it resembles Clinton in several characteristics. It differs in too many traits, including disease reaction and test weight, to ascribe its origin to mutation.

Tonka was entered in preliminary yield trials in 1953 and was advanced to the Spring-sown Oat Variety Test in 1955, where it remained until 1957. From 1956 through 1958 it was tested in the Regional Uniform Spring-sown Red Oat Nursery which is grown in 14 states including Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas and Virginia.

Description

Tonka can be characterized as follows: juvenile growth erect (spring habit); plants early, midtall; culms large, stiff, glabrous at the nodes; sheaths and leaves light green, glabrous; panicles equilateral, erect, mid-

sized; spikelets usually 2-flowered, separating by semiabscission or fracture; florets separating by fracture or modified disarticulation; grain plump, blocky, midlong; lemmas yellow, short to midlong; awns absent in most years in Oklahoma. The expression of certain of these characters may vary under different environments.

Under field conditions Tonka may show a spontaneous appearance of occasional "off-type" plants that are taller, later, darker green in color, and have a lax "lacy" panicle. Seed of the off-type plants may vary from normal Tonka to long, slender kernels with awns. Normal purification procedures have not eliminated these "off-types"; therefore the occasional appearance of such plants is a normal characteristic of the variety. Further experience is necessary to establish usable tolerance levels.¹

Performance

Yield and other data comparing Tonka with four other Oklahoma-adapted spring oat varieties tested at Stillwater from 1953-1957 (excluding 1956) are shown in Table 1. In Table 2, Tonka is compared with four other spring oat varieties tested in the Regional Uniform Spring-sown Red Oat Nursery from 1956 through 1958.

Yield of Grain

Tonka produces good yields of high quality grain. At Stillwater it yielded slightly more than Kanota and considerably more than Andrew, two of the better spring oats now being grown in Oklahoma. In the regional tests, totaling 53 station-years, it averaged 6.2 bushels less than Andrew but outyielded Kanota, Nemaha and Clinton "59."

Test Weight

Tonka excels in the production of high test weight grain.² At Stillwater Tonka averaged 4.0 pounds per bushel higher than the next highest variety, Kanota. In the regional test covering 39 station-years it averaged 35.1 pounds, or 6.0 pounds higher than Kanota and 5.0 pounds higher than Andrew. Mr. F. A. Coffman (presently in charge of winter oat investigations for the U.S.D.A.), after observing Tonka in the regional nursery for three years, made the statement, "In tests with other early maturing oat varieties, in areas where adapted, the test weight of

¹Similar off-type plants are commonly observed in the Clinton variety.

Tonka, C.I. 7192, has by all odds placed that variety in a class by itself. Its test weight has been so phenomenal the variety should be utilized in hybridization for the improvement of test weight in early oats."³

One of the major criticisms of growing spring oats in Oklahoma is the low test weight grain produced by the presently available varieties. The Tonka variety should make spring oats a more profitable crop in Oklahoma because of its high test weight grain.

Maturity

Tonka is a very early maturing variety. During the 4-year test

Table 1.—Performance comparisons of Tonka (C.I. 7192) with four other spring oat varieties during the period 1953-1957 at Stillwater, Oklahoma.

Variety	C.I. No.	1953	1954	1955	1957	Avg.
Yield—bushels/acre						
Tonka	7192	18.5	32.7	33.3	28.5	28.3
Kanota	839	19.5	28.9	21.5	32.1	25.5
Neosho	4141	9.7	26.4	16.7	12.6	16.4
Cherokee	5444	13.7	23.4	17.6	10.2	16.2
Andrew	4170	12.6	36.6	20.9	17.4	21.9
Test Weight—pounds/bushel						
Tonka	7192	22.0	37.0	32.1	31.9	30.8
Kanota	839	27.5	32.8	23.7	23.1	26.8
Neosho	4141	21.0	29.0	27.0	18.7	23.9
Cherokee	5444	24.0	29.4	25.6	21.3	25.1
Andrew	4170	21.2	32.0	27.0	23.1	25.8
Date Headed						
Tonka	7192	5-17	5-8	5-16	5-20	5-15
Kanota	839	5-18	5-9	5-13	5-19	5-15
Neosho	4141	5-23	5-26	5-23	5-24	5-24
Cherokee	5444	5-20	5-21	5-18	5-28	5-22
Andrew	4170	5-20	5-18	5-21	5-24	5-21
Height—inches						
Tonka	7192	22	27	27	35	28
Kanota	839	22	25	22	34	26
Neosho	4141	19	27	26	34	27
Cherokee	5444	24	25	27	30	27
Andrew	4170	23	29	29	35	29
Lodging—percent						
Tonka	7192		3	1	9	4
Kanota	839		20	29	34	28
Neosho	4141		5	2	0	2
Cherokee	5444		2	1	16	6
Andrew	4170		7	0	38	15

period at Stillwater it averaged heading as early as Kanota, one of the earliest spring varieties on record. Tonka averaged 6 days earlier in maturity than Andrew and 7 days earlier than Cherokee. For the 36 station-year period in the regional test Tonka averaged 3 and 2 days earlier than Kanota and Andrew, respectively.

Table 2.—Performance comparisons of Tonka (C.I. 7192) with four other spring oat varieties grown in the Regional Uniform Spring-sown Red Oat Nursery during the period 1956-1958.¹

Variety	C.I. No.	1956	1957	1958	Avg.
Yield—bush/ls/acre					
		(20) ²	(18)	(15)	(53)
Tonka	7192	37.1	54.5	57.5	48.8
Kanota	839	37.3	46.0	55.8	45.5
Andrew	4170	45.8	56.7	65.4	55.0
Nemaha	4301	37.9	50.9	54.6	47.1
Clinton "59"	4259	39.4	48.3	58.2	47.7
Test Weight—pounds/bushel					
		(15)	(13)	(11)	(39)
Tonka	7192	35.7	34.6	34.9	35.1
Kanota	839	30.2	27.3	29.8	29.1
Andrew	4170	30.8	28.9	30.4	30.1
Nemaha	4301	31.5	29.9	31.0	30.8
Clinton "59"	4259	31.2	27.8	32.0	30.3
Date Headed					
		(10)	(13)	(13)	(36)
Tonka	7192	5-29	6-5	6-6	6-3
Kanota	839	6-1	6-7	6-9	6-6
Andrew	4170	5-31	6-7	6-7	6-5
Nemaha	4301	6-1	6-8	6-8	6-6
Clinton "59"	4259	6-3	6-11	6-11	6-9
Height—inches					
		(13)	(11)	(13)	(37)
Tonka	7192	26	33	33	30
Kanota	839	27	33	34	31
Andrew	4170	28	35	36	33
Nemaha	4301	27	34	33	31
Clinton "59"	4259	27	34	34	32
Lodging—percent					
		(8)	(12)	(10)	(30)
Tonka	7192	8	33	17	21
Kanota	839	41	69	50	55
Andrew	4170	23	44	27	33
Nemaha	4301	13	38	23	26
Clinton "59"	4259	12	32	25	24

¹States growing this nursery for all or a part of the period 1956-58 include Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas and Virginia.

²Numbers in parentheses refer to number of station-years included in averages.

Earliness is of extreme importance in growing spring oats in Oklahoma. Early varieties have a better chance of escaping disease epidemics and hot, dry winds that often plague spring oats.

Height

Tonka is classed as a short variety, or about like Kanota. In Oklahoma tests it averaged slightly taller than Kanota, but in the regional test it was slightly shorter.

Lodging Resistance

Tonka is classified as a stiff-strawed variety. Its straw strength is similar to that of its progenitor, Clinton, and to Neosho and Nemaha.

Disease Reaction

Barley Yellow Dwarf Virus — Tonka has considerable resistance to barley yellow dwarf, a virus disease which is now causing widespread damage in many oat producing areas. Tonka was one of the best of the commercial oat varieties for resistance to yellow dwarf in the North-central States in 1959.⁴

Crown and Stem Rust — Tonka is susceptible to most of the commonly occurring races of crown and stem rust.

Victoria Blight — Tonka has shown good resistance to Victoria blight.

Seeding Date and Rate

In general Tonka should not be seeded prior to February 15 in Oklahoma because of lack of tolerance to low temperatures. However, it should be seeded as soon as possible after February 15 for best results.

The seeding rate of Tonka should be at least 2 bushels per acre to insure an adequate plant population. Thinner seedings may result in thin stands because of inadequate tillering, characteristic of spring oats grown in Oklahoma.

²Schlehuber, A. M. A new source of high test weight in spring oats. *Agron. Jour.* 49:519. 1957.

³Pe.sora¹ communication, June 13, 1960.

⁴Dr. H. C. Murphy, Head, Oat Section Crops Research Division, USDA. Personal communication, July 25, 1960.

