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## HUME—A Hard, Red Winter Wheat

A bearded, brown-chaffed, hard red winter wheat recommended for the southwestern two-thirds of South Dakota and possessing superior characteristics of hardiness, earliness, yield, test weight, milling and baking characteristics, and resistance to stem rust.

AGRONOMY DEPARTMENT  
AGRICULTURAL EXPERIMENT STATION  
SOUTH DAKOTA STATE UNIVERSITY, BROOKINGS

# HUME—A Hard, Red Winter Wheat

By D. G. WELLS, G. W. BUCHENAU, and J. J. BONNEMANN<sup>1</sup>

Each year South Dakota farmers have been seeding about 2,250,000 acres of wheat of which 600,000 acres have been winter wheat. Nebred, a Turkey type wheat released in 1938 by Nebraska, has been dominant, constituting about 23% of the winter wheat acreage in 1965 and 45% in 1964. In the severe stem rust year of 1962 Nebred made up about 80% of the acreage. Losses to winter wheat growers from stem rust in 1962 were estimated in excess of \$20,000,000. Other varieties susceptible to stem rust and still in use are Warrior, Omaha, Wichita, Cheyenne, and Bison.

## ORIGIN OF HUME WHEAT

Hume winter wheat is the first winter wheat developed and released in South Dakota. Its high resistance to stem rust traces back to the pioneering and epochal work of E. S. McFadden of Webster, South Dakota, who put rust resistance into bread wheat from emmer. McFadden's breeding work with emmer-Marquis crosses began in 1915 and was completed in 1928.

Hume was developed from crosses made in 1945 with Nebred, Cheyenne, Minter, Kharkoff and other varieties by J. E. Grafius. He used two cycles of recurrent selection for winterhardiness and earliness. Hume was finally

chosen from among surviving lines in 1956 by V. A. Dirks. Following verification of its good qualities, purification, and increase. Hume was released to growers in 1965.

Hume was named in honor of Dr. A. N. Hume, head of the Agronomy Department for 32 years until his retirement in 1943.

## DESCRIPTION OF HUME

Hume will strengthen and help stabilize winter wheat production in South Dakota because of its resistance to stem rust, earliness and winter hardiness (Table 1). Hume is bearded, brown-chaffed, resistant to lodging and shattering and resembles Nebred in height and maturity. In some years and locations, Hume has been hardier than Nebred. It is susceptible to leaf rust and streak mosaic.

New varieties recently released by other agencies are Lancer, Scout, Gage and Winalta. Hume is hardier than the first three and has better resistance to stem rust than Winalta. Lancer, while less hardy than Hume (resembling Cheyenne in that respect), has a high tillering capability that helps compensate for its lower level of hardiness. Lancer

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has generally shown a somewhat higher level of grain yields than Hume at Presho and Highmore (Tables 2 and 3). In tests at Brookings and Beresford (Tables 4 and 5), where winters are normally more severe, Hume has shown a higher level of yields than most varieties with which it has been compared.

The variety Ottawa has been increasingly popular but has suffered from susceptibility to race 15B-2 of stem rust to which Hume is resistant. Ottawa is much less hardy than Hume.

In pilot-plant studies made in

1963 and 1964 of milling and baking characteristics, Hume has been shown to be good (Table 6).

Hume may replace much of the Nebred acreage and may thrive farther north than where Nebred has been consistently successful. Hume's ultimate place in the winter wheat acreage will be determined by its performance on the farm and by the duration of its resistance to stem rust.

More extensive utilization of winter wheat depends upon the availability of reasonably early, more rust resistant, hardier varieties. Hume is a step in that direction.



Figure 1. Typical intercrossing of hardy  $F_2$  lines at Brookings in a program of recurrent selection for hardiness. These lines were transplanted from the survivors of hundreds tested at the Northeast Research Farm, Watertown.

Table 1. Performance of Hume and Selected Varieties in the Northern Regional Performance Nurseries, 1962-1963.

Variety	1962-63 Average in Northern Regional Performance Nursery Tests							Winter survival in 4 row plots	Winter survival Brookings in 4 row plots	
	C. I. No.	Date $\frac{1}{2}$ headed	Date ripe	Plant ht.	Lodging	Leaf rust	Stem rust			Test wt.
Station years		24 June	4 July	23 in.	5 %	6 %	9 %	24 lbs.	10 %	2 %
Nebred	10094	4	20	34	32	80	66	56	62	82
Hume	13526	2	21	34	23	66	14	59	63	83
Lancer	13547	3	22	33	21	75	12	59	49	48
Scout	13546	5/30	23	33	24	80	18	58	42	45
Winalta	13670	4	21	36	—	72	29	59	64	83
Minter	12138	6	23	38	20	53	13	58	73	91

Table 2. Performance of Selected Varieties at the South Central Research Farm, Presho, 1961-1965.

Varieties	Grain yields					Test weights								
	1961	1962	1963	1964	1965	Means		1961	1962	1963	1964	1965	Means	
						61-65	64-65						61-65	64-65
				bushels							pounds			
Nebred	24.7	1.4	28.4	33.6	10.6	19.7	22.1	50	29	58	61	50	50	56
Hume	32.9	13.6	25.0	28.4	31.6	26.3	30.0	54	51	59	58	59	56	59
Lancer		20.9	35.4	35.8	30.7		33.3		53	60	60	59		60
Scout				41.2	23.2		32.2				62	57		60
Gage				38.9	25.9		32.4				61	56		59
Winalta			38.5	36.5	19.3		27.9			59	61	55		58
Minter	31.8	1.8	22.8	32.8	26.1	23.1	29.5	50	51	56	61	57	55	59
Ottawa	33.8	18.0	39.2	39.3	12.8	28.6	26.1	58	54	60	62	54	58	58
Warrior	30.2	4.0	36.4	43.6	10.5	24.9	27.1	48	33	58	61	48	50	55
Omaha	45.0	6.6	35.0	34.0	20.3	28.2	27.2	57	43	61	60	56	55	58

Table 3. Performance of Selected Varieties at the Central Substation, Highmore

Varieties	Grain yields						Test weights			
	1961	1963	1964	1965	Means		1963	1964	1965	Means
					61-65	64-65				
			bushels				pounds			
Nebred	12.2	28.9	22.2	15.7	19.8	19.0	58	58	53	55.5
Hume	8.0	31.7	16.0	33.9	22.8	25.0	59	56	59	57.5
Lancer	7.6	30.5	21.7	39.7	24.9	30.7	59	59	61	60.0
Scout			27.1	35.4		31.3		61	59	60.0
Gage			27.4	29.2		28.3		60	58	59.0
Winalta			18.3	25.7		22.0		58	58	58.0
Minter	22.2	23.5	15.3	22.8	21.0	19.1	58	56	58	57.0
Ottawa	8.5	40.5	25.6	17.8	23.1	21.7	59	59	55	57.0
Warrior	10.2	34.8	21.3	13.4	19.9	17.4	56	58	50	54.0
Omaha	6.9	36.0	24.3	24.2	22.9	24.3	60	58	58	58.0

Table 4. Performance of Selected Varieties at the Agronomy Farm, Brookings, 1962-1963.

Variety	Grain yields		
	1962	1963	Means
			1962-63
	bushels		
Nebred	1.8	7.8	4.8
Hume	13.8	24.4	19.1
Lancer	6.6	19.6	12.6
Minter	9.7	20.1	14.9
Ottawa	11.6	6.3	9.0
Warrior	1.9	5.7	3.8
Omaha	3.1	17.0	10.1

Table 5. Performance of Selected Varieties at the Southeast Research Farm, Beresford.

Variety	Grain yields*				Test weights		
	1962	1963	1964 bushels	Means	1963	1964 pounds	Means
				62-64			63-64
Nebred .....	2.9	9.3	30.7	14.3	50	61	55
Hume .....	10.5	17.9	34.0	20.8	58	61	59
Lancer .....	5.8	18.3	37.1	20.4	58	61	60
Scout .....			40.7			61	
Gage .....			39.2			61	
Winalta .....			35.6			61	
Minter .....	8.9	16.8	34.6	20.1	57	62	60
Ottawa .....	6.0	13.0	33.5	17.5	59	62	60
Warrior .....	5.2	7.2	36.3	16.2	46	61	53
Omaha .....	6.2	10.5	35.0	17.2	53	61	57

\*Extensive winterkilling of the 1965 test was the reason for its not being harvested.

Table 6. Milling and Baking Qualities of Hume, Nebred and Omaha Based on Pilot-Plant Studies over Two Crop Seasons, 1963 and 1964.\*

Variety	Milling Quality				Bread Making Quality					
	Milling values†		Test weight		Total score		Mixing time		Rank‡	
	1963	1964	1963	1964	1963	1964	1963	1964	1963	1964
Hume	4.09	4.02	58.6	60.3	87.5	87.2	Med.	Med.	1.2	1.8
Nebred	4.06	3.85	59.4	60.0	87.1	87.2	Med.	Long	2.0	2.1
Omaha	4.12	4.32	57.5	59.5	77.9	86.7	Med.	Long	2.7	2.0

\*These evaluations are by courtesy of John A. Johnson, Professor of Milling Industry, Kansas State University, and Karl F. Finney, Chemist, Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Hard Winter Wheat Quality Laboratory, Kansas State University.

†Calculated economic value based on flour extraction and cumulative ash content.

‡A weighted rank ranging from 1.0 for best quality to 3.0 for poorest quality.

