

California's Wheat

most of state's wheat of strains developed by backcross breeding

— Coit A. Suneson, Charles W. Schaller, and Loren L. Davis

A total of 15 improved backcrossed strains of popular wheat varieties were distributed in California between 1937 and 1950.

The improved strains—which carry numbers, following the variety name, to denote the year of its development—can not be distinguished from the original varieties whose names they bear except by testing to a specific race of bunt. Further separation of the 15 improved varieties would require other tests because a continuing sequence of improved strains, such as Baart 38 and Baart 46, have been produced from the old Baart variety. The backcross method of breeding—which emphasizes continued likeness—requires specific testing to determine the precise identity of seed stocks under examination.

In 1952, 289 field samples—collected in 30 counties during a survey in 1951—were identified by tests at Davis. The improved and nonimproved strain proportions of each variety type were determined precisely.

The varieties in the accompanying table are listed in three groups. The first group of five varieties has received the most intensive breeding and occupied 50.6% of the acreage in 1934 and 84.6% in 1949. The survey indicated that about 80% of the 1951 acreage, of these five varieties, was sown to improved strains which are resistant to bunt and to stem rust. White Federation 38, the most widely grown variety, was grown on 94.4% of the fields sown to strains of White Federation.

Bunt resistance only has been added

to the six last named varieties listed in the table. In 1934—before any of the improved varieties had been produced—these variety types comprised 40.4% of the total wheat acreage of California. By 1949 this acreage was reduced to 10.6%, including the bunt resistant forms of these varieties. Three of these varieties are practically extinct.

The other varieties not listed by name in the table include remnants of old varieties or recent introductions from other states or countries. They are grown in only one half as many fields as in

1934, and now occupy about 4.5% of the total acreage.

The survey further indicated that about 75% of the 1951 wheat acreage of California was in improved types; that there is an increasing dominance of the more highly improved varieties; and, that there has been a decline in the number of varieties grown.

A continuing series of further improvements in the principal varieties are scheduled for release. Benefits from these accruing improvements will not necessarily require a change from a desired variety type, but merely a change to seed stocks of the most improved form of the variety.

Coit A. Suneson is Research Agronomist in Cereal Crops and Diseases, University of California, Davis.

Charles W. Schaller is Assistant Professor of Agronomy, University of California, Davis.

Loren L. Davis is Extension Specialist in Agronomy, University of California, Davis.

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Acreage Occupied by Backcross Improved Wheat Varieties in California in 1951, as Determined from 289 Identified Field Samples Collected in 30 Counties

Variety type	Proportion of acreage				Designations of latest improved release of variety
	State-Federal survey estimates		Survey of 1951 crop		
	1934	1949	Type total	Backcross improved ¹	
	Pct.	Pct.	Pct.	Pct.	
White Federation . . .	17.1	32.2	24.6	94.4	White Federation 38
Ramona	0.1	25.3	24.2	85.7	Ramona 50
Baart	27.6	19.9	15.6	71.1	Baart 46
Big Club	5.5	5.2	13.1	55.3	Big Club 43
Poso	0.3	2.0	2.4	71.4	Poso 48
Total	50.6	84.6	79.9		
Onas	4.6	5.0	7.3	40.1	Onas 41
Pacific Bluestem	7.1	3.6	4.5	76.9	Pacific Bluestem 37
Bunyip	11.4	1.8	2.8	12.5	Bunyip 41
Federation	9.3	0.2	0.7	0	Federation 41
Sonora	5.5	0	0.3	0	Sonora 37
Escondido	2.5	0	0		Escondido 41
Total	40.4	10.6	15.6		
Others	9.0	4.8	4.5		

¹ Percentage of each varietal type devoted to improved backcross strains.

CEREALS

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white as compared to the normal color of developing seeds.

As with barley the intensity of symptoms is directly correlated with the age of the plant when infected. Late infections of oats can be recognized only by the characteristic reddening of late emerging leaves.

Wheat infected in the seedling stage shows a darker than normal green color of the outer leaves, a chlorosis of the new growth and an over-all stunting—one

third to one half of normal size. The heading is sparse, and the yield is negligible.

Infection of wheat at later growth stages—after tillering—shows a bright yellowing starting at the tips of newly formed leaves. There seems to be little if any stunting in wheat infected much after the tillering stage.

None of the major cereal crops—barley, oats, and wheat—show any mottle of a mosaic type. Neither leaf serration nor head blasting have been encountered as symptoms of the yellow dwarf disease in wheat.

Rye appears to be the most tolerant of the small grains to yellow dwarf. This observation is limited to one variety, Merced, which exhibited no discoloration and little or no stunting in fields where barley, oats and wheat were severely damaged.

John W. Oswald is Associate Professor of Plant Pathology, University of California, Davis.

Byron R. Houston is Associate Professor of Plant Pathology, University of California, Davis.

C. W. Schaller, Assistant Professor of Agronomy, University of California, Davis, co-operated in the experimental plantings.