4 remained dwarfed and stunted for several weeks and developed abnormally small and misshapen leaves.

Field tests

The field tests consisted of two experiments. In the first experiment the treatments included Ethrel applications at (1) 250 ppm, and (2) 500 ppm; as well as the (3) check plot. Treatments 1 and 2 received two applications of Ethrel (66-329). The first application was made at the time of the first fully expanded true leaf and the second application was made one week later. The plant variety was SMR-58 (monoecious). There were 12 plants in each treatment and each treatment was replicated three times. The plants were thinned to 5 inches between single plants.

The Ethrel treatments produced complete femaleness. The 500 ppm concentration was too high and caused dwarfism, and abortion of flowers at the first three nodes. It was also concluded that a double application of 250 ppm was too high, as indicated by length of vine (growth). A second field experiment was designed consisting of five treatments and the check plot: (1) check, (2) 250 ppm (one application), (3) 100 ppm (one application), (4) 100 ppm (two applications), (5) 50 ppm (one application), and (6) 50 ppm (two applications).

Picadilly

The variety used was Piccadilly (a gynoecious hybrid). The timing of applicatins, number of plants per treatment and replications were the same as in the first field experiment. The experiment was terminated after the formation of the eighth node—due to a late planting. The effect of Ethrel on sex expression was the same as in the other experiments in that femaleness was induced in all treatments. Plant size was also reduced with treatment and dwarfism was produced by the doubled 100 ppm application rate (treatment 4). Results of the second field experiment were as follows:

Treatment	Average No. female flowers	Average No. male flowers	Average length of vine
			inches
1	2.1	5.3	13.5
2	8	0	9.5
3	8	0	10.5
4	8	0	10.1
5	6.4	1.1	12.7
6	8	0	10.2

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MONTEZUMA OAT VARIETY *produces high test weight, and good yields*

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HIGH TEST WEIGHT and good grain yield can both be obtained by California's oat growers with Montezuma, a new oat variety released by the University of California Agricultural Experiment Station at Davis in cooperation with the U. S. Department of Agriculture.

High quality

Montezuma's test weight, consistently high compared with other oat varieties fall-planted in California, indicates that this variety has high-quality grain with a relatively low amount of crude fiber. Test weight (in pounds per bushel) is a measure of kernel plumpness and Montezuma has shown a 16 per cent higher test weight than Sierra in three years of experiments (table 1). One reason for the high test weight of Montezuma is its relatively high proportion of large, plump kernels compared with both Curt and Sierra (see photo). The variety Kanota also has a high test weight, but, unlike Montezuma, it is susceptible to shattering. Montezuma is suitable for direct combine harvesting.

Montezuma (formerly CAS 5022) was selected in 1965 from a group of 88 lines derived from oat Composite Cross II which involved crosses of cultivated oats with wild oats (*Avena fatua* L). Described as a spring type red oat, Montezuma's early growth habit is semi-prostrate with a high tillering capacity. The leaf blades are mid-wide, panicle type, mid-sized, and equilaterally compact with matured lemmas mid-long to long. It has numerous spikelets per panicle and awns are common on the primary florets.

Grain yield

The average grain yield of the new variety was 3,460 lbs per acre after three years of testing compared with 3230 lbs for Sierra and 3140 lbs for the Curt variety. Yield data by location are summarized in table 1.

The relative maturity and phenotypic characteristics of Montezuma compared

TABLE 1. TEST WEIGHT AND GRAIN YIELD OF MONTEZUMA OATS COMPARED WITH SIERRA AND CURT AT FOUR LOCATIONS

VARIETY	LOCATION									
	Yolo (3 yr ave.)		Fresno (2 yr ave.)		Stanislaus (1 yr ave.)		Riverside (3 yr ave.)		Average 9 experiments	
	TEST WEIGHT									
	lbs/bu.	% of Sierra	lbs/bu.	% of Sierra	lbs/bu.	% of Sierra	lbs/bu.	% of Sierra	lbs/bu.	% of Sierra
Montezuma	36	116	37	112	37	116	....	...	37	116
Sierra	31	100	33	100	32	100	....	...	32	100
Curt	33	106	33	100	35	109	....	...	33	103
	GRAIN YIELD									
	lbs/acre	% of Sierra	lbs/acre	% of Sierra	lbs/acre	% of Sierra	lbs/acre	% of Sierra	Average lbs/acre	12 experiments % of Sierra
Montezuma	4080	118	3730	117	1180	69	3430	96	3460	107
Sierra	3450	100	3180	100	1710	100	3560	100	3230	100
Curt	3420	99	3120	98	1100	64	3550	100	3140	97

with seven other California varieties are summarized in table 2. Since oat acreage of the varieties Indio, Rapida and Ventura is relatively limited, comparisons are made only between Montezuma and the currently popular varieties, Sierra, Curt, Kanota, and California Red. This new variety matures eight to 15 days earlier than Sierra and is rated slightly earlier than Curt and Kanota. Montezuma is less desirable than the later maturing varieties for fall planting where late frost is common at flowering.

TABLE 2. CHARACTERISTICS OF EIGHT OAT VARIETIES WHEN FALL-PLANTED IN CALIFORNIA

Variety	Relative maturity†	Test weight	Plant height	Straw strength	Shatter resistance
Rapida*	Very early	Light	Medium to short	Weak	Resistant
Indio	Early	Light	Medium to short	Medium	Intermediate
MONTEZUMA	Early	Heavy	Medium	Medium to strong	Resistant
Curt	Medium	Medium	Short	Strong	Resistant
Kanota	Medium	Heavy	Tall	Weak	Susceptible
Sierra	Medium late	Medium	Medium to tall	Strong	Resistant
Ventura	Medium late	Medium	Medium to tall	Weak to medium	Intermediate
California Red	Late	Medium	Tall	Weak	Susceptible

* Not competitive in grain yield with other varieties, but recommended as a specialty crop for use as pasture or grain when rapid growth and early development are essential.
† Approximate maturity range of 30 to 45 days.

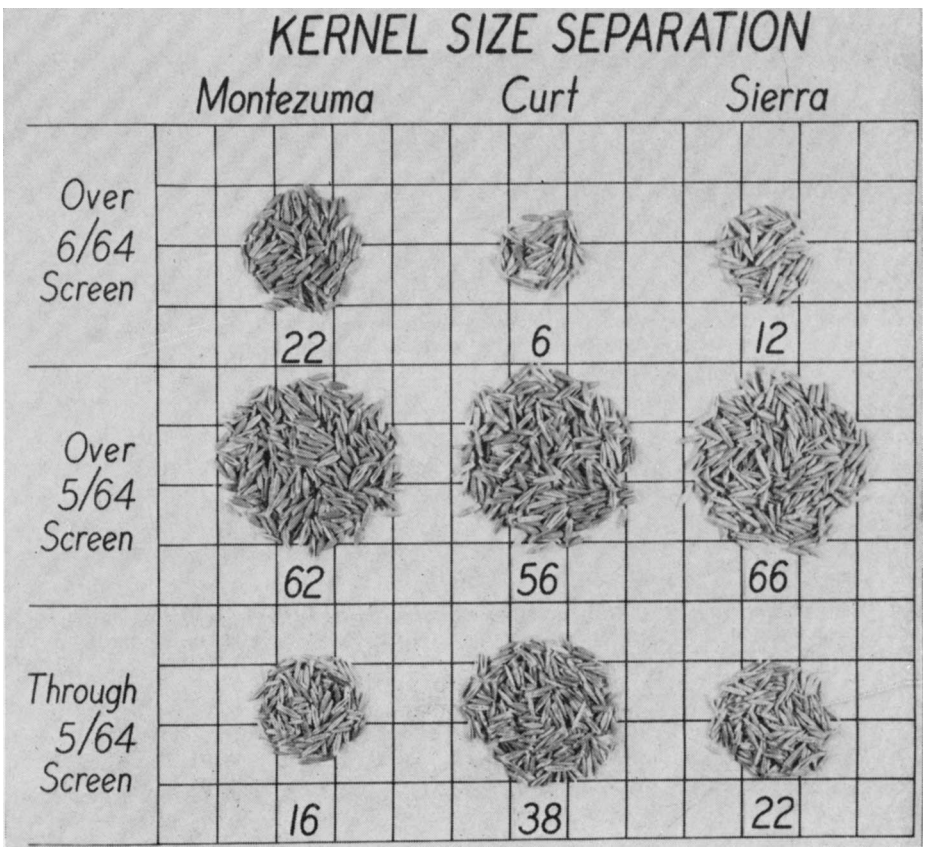
Shatter resistance

Medium plant height plus good straw strength and shatter resistance are characteristics that differentiate Montezuma from California Red. Although oat forage yield data are limited, results to date indicate Montezuma to be satisfactory for growers who desire a variety with earlier maturity. It also will serve the needs of oat growers who want a variety that will not drop its seed if harvest is somewhat delayed.

Observations on disease reaction are incomplete for all oat-growing areas but it is possible that its relative earliness may allow Montezuma to escape serious damage from barley yellow dwarf virus. Its comparative reaction to stem rust and mildew is unknown. A continued effort is planned to evaluate oat varieties for disease reaction, forage and grain yields.

Breeders and Foundation seed stocks are maintained for production of registered seed by the Department of Agronomy and Range Science, U. C. Davis.

Kernel size assortment for 20 grams each of three oat varieties after sizing with 6/64 and 5/64 screens. Figures indicate percentage of each kernel size by variety. Twenty-two per cent of Montezuma kernels remained on the 6/64 screen compared with 6 and 12 per cent for Curt and Sierra, respectively.



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