

Corn Hybrids

Adapted for Missouri

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CORN HYBRIDS ADAPTED FOR MISSOURI¹

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Corn growers have expressed considerable interest in information concerning the characteristics of open-pedigreed hybrids adapted to Missouri. A brief description of each hybrid, its performance record, and its region of adaptation are presented here, along with illustrations of the hybrids. This information should aid the farmer in choosing a hybrid to grow on his farm, and should be helpful also to county agents, vocational agriculture instructors, and others. The performance records of the various hybrids in different regions may be even more important than their descriptions.

Securing Performance Data

Yield trials of corn hybrids are conducted yearly by the Field Crops Department of the Missouri Agricultural Experiment Station, at two to four locations each in the Northern, Central, and Southern regions of the state. Each hybrid is planted by hand in four plots, each two rows wide by ten hills long. The plots are distributed over the testing field in a random design that compensates for differences in soil fertility.

The corn from each plot is har-

vested by hand, and acre yields are computed from the field weights adjusted for moisture differences on the basis of shelled corn with 15.5 per cent moisture. Yields of hybrids exceeding 15.5 per cent moisture are adjusted downward while those having a moisture content lower than 15.5 per cent are adjusted upward.

The moisture percentage of each hybrid at each testing location is determined on the grain from ten ears picked at random. Several rows of kernels are removed from each ear and bulked, and a moisture determination of this bulked sample is made with a Tag-Heppental moisture meter.

Root and stalk lodging is determined by actual count. A plant that leans more than 30 degrees from the vertical is counted as root lodged, and a plant with the stalk broken below the ear is counted as stalk-lodged. These counts are then computed to percentages of the total number of plants.

Ear height grade represents the approximate number of feet from the ground to the point where the upper ear is attached to the stalk.

Data presented for the Northern

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region for the four-year period are from averages of tests in two locations in 1947, three in 1948, three in 1949, and four in 1950. The Central region data are from averages of one test in 1947, four in 1948, three in 1949, and four in 1950. In the Southern region the data are from averages of three locations in 1947, two in 1948, two in 1949, and four in 1950.

Interpreting Performance Records

Since the performance records represent averages for a period of years, any fluctuations due to extreme environmental conditions for any particular year are averaged to give a better estimate of the hybrid under consideration.

Earlier comparisons were made between hybrids and open-pollinated varieties, but due to the rapid shift from open-pollinated varieties to hybrids this comparison is no longer feasible. In order to compare the relative merits of one particular hybrid with another the averages of all hybrids grown in the same tests are given in each summary.

In general, the yields of hybrids are highest in the Northern region and lowest in the Southern region. Root lodging is higher in the Central and Southern regions, which is due primarily to more severe wind and rain storms during August and September. Stalk lodging does not follow this same pattern since considerable stalk lodging in the Northern region has been due in part to the European Corn Borer during the last few years, while most of

the stalk lodging in the Southern region is caused by early maturity followed by stalk rotting organisms. The stalk lodging in the Central region is somewhat lower than either the Northern or Southern region, and is due to less borer damage and stalk rots. Ear heights show a gradual decline from the Northern region to the Central and Southern regions.

Description of Hybrids

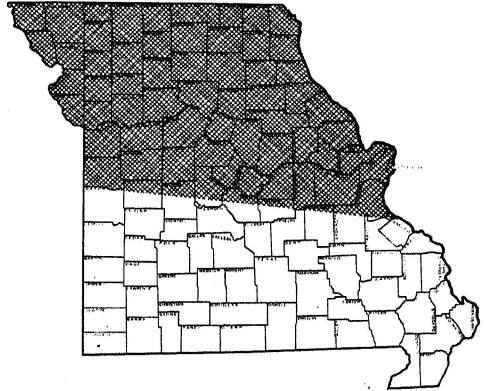
It is difficult to describe each hybrid in detail since some characteristics are evident only in particular years or localities. This fact can be readily understood when one considers that certain diseases of corn may be present in only one year out of ten. The general description of hybrids given here is intended only to give the more pertinent facts as observed during the past four years.

Recommended Areas of Adaptation

The recommended areas of adaptation for a hybrid should not be interpreted to mean that these are the only areas in which that hybrid should be grown. It is intended to give only the region or regions in which a hybrid has given its best performance. For example, U. S. 13 is recommended for Northern half of Missouri, but large acreages of this hybrid are grown in Southern Missouri where farmers are satisfied with its performance. However, if maximum yields are desired in the Southern half of Missouri, such hybrids as Mo. 804 and U. S. 523W should be grown. These latter hybrids, due to their later maturity, take greater advantage of the longer growing period.

U. S. 13 (WF9 x 38-11) (L317 x Hy)
 or
Mo. 313 (WF9 x 38-11) (L3 x Hy)

U. S. 13 is the most widely grown hybrid in Missouri and in the Corn Belt. This hybrid was developed in the cooperative breeding program of several Corn Belt experiment stations and the U. S. Department of Agriculture. Two of the inbred lines, WF9 and 38-11, were developed at the Purdue Agricultural Experiment Station, inbred line L317 at the Iowa Station and inbred line Hy by the Kansas and Illinois Experiment Stations. During the process of developing the inbred line L317 at the Iowa Station, seed of the third or fourth generation selfs was sent to the Missouri Station. Continued selfing and selection at the Missouri Station resulted in the development of inbred line L3. Crosses between L3 and L317 do not give an indication of hybrid vigor. However, inbred line L3 is slightly more vigorous than L317. U. S. 13 and Mo. 313 were released for commercial production at approximately the same time. The performance record for these two hybrids is given



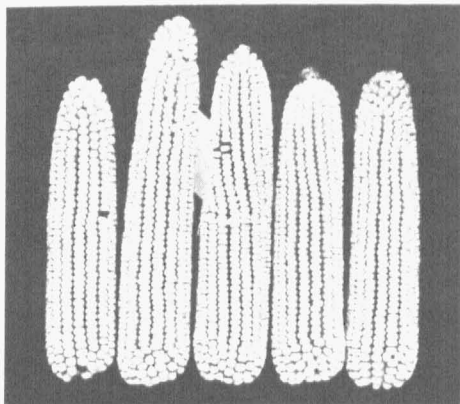
The hybrid known as U. S. 13 and Mo. 313 is adapted for the region of the state indicated by the shaded area of this map.

in Table 1. Mo. 313 has given a slightly less, but probably not significantly lower, acre yield in each of the three regions.

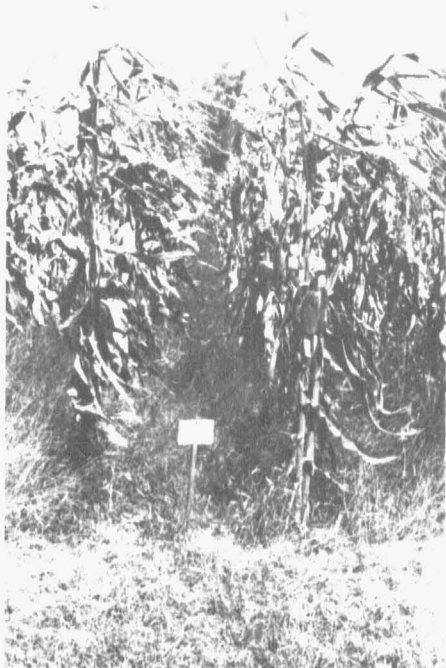
U. S. 13 makes an excellent yield on a wide range of soil types and soil fertility. Certain new hybrids may yield better in a particular year, but U. S. 13 is very difficult to excel over a period of years. The ears usually are borne at a medium height on the stalk but may be rather high on soils of high fertility in seasons of high rainfall. It has a good root system and is average in resistance to stalk lodging. U. S. 13 will drop a high percentage of ears on certain soil types, in combination with the certain environmental conditions. It is very popular with farmers who husk by hand because of its ease in husking.

Table 1.--Average Performance Record for the Four-Year Period 1947, 1948, 1949, and 1950 Comparing U.S. 13, Mo. 313, and the Average of Yellow Hybrids.

Hybrid Average	Acre Yield Bu.	Mois- ture %	Lodged Root %	Plants Stalk %	Ear Height Grade
Northern Region					
U. S. 13	84.9	16.1	1.5	8.9	3.9
Mo. 313	81.2	16.7	0.6	10.3	3.9
Yellow Hybrids	84.0	16.1	1.7	8.4	3.8
Central Region					
U. S. 13	73.2	16.2	8.6	6.5	3.6
Mo. 313	72.1	16.7	12.7	6.3	3.6
Yellow Hybrids	73.6	16.4	12.0	5.8	3.6
Southern Region					
U. S. 13	69.2	15.8	15.8	13.5	3.3
Mo. 313	67.1	15.6	13.5	11.9	3.2
Yellow Hybrids	68.4	15.8	16.2	14.2	3.4



U. S. 13 is especially adapted to the Northern half of Missouri, but it is also very popular in the Southern half of Missouri. Since U. S. 13 does not take advantage of the longer growing period in the Southern half of Missouri, many later-maturing hybrids will outyield it.



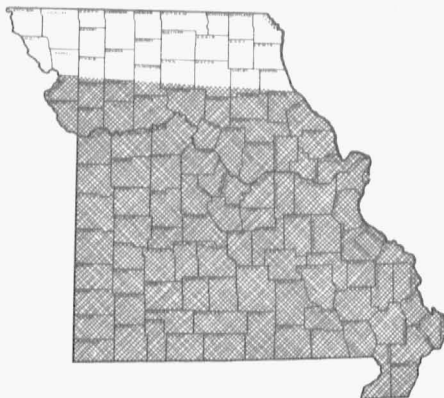
Mo. 148 (WF9 x 38-11) (L3 x K4)

or

Ill. 200 (WF9 x 38-11) (L317 x K4)

Mo. 148 has the same pedigree as Ill. 200 except that inbred line L3 is substituted for L317. Mo. 148 is about 3 to 5 days later than U. S. 13. It is adapted to the Southern two-thirds of Missouri, where due to its longer growing period, it usually outyields U. S. 13, especially on soils of high fertility. The ears of Mo. 148 may be borne high on the stalk on soils of high fertility combined with ample rainfall. Mo. 148 also has a two-eared tendency. Performance records indicate Mo. 148 to have a slight advantage in yield over Ill. 200 in the Northern and Southern regions. In comparison with U. S. 13, its aver-

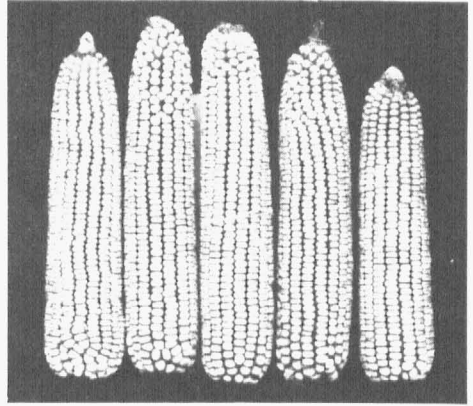
age yield is about the same but its root system is weaker.



Hybrid Ill. 200 and Mo. 148 is adapted to the region of the state indicated by the shaded area of this map.

Table 2.--Average Performance Record for the Four-Year Period 1947, 1948, 1949, and 1950 Comparing Mo. 148, Ill. 200, U.S. 13, and Average of Yellow Hybrids.

Hybrid Average	Acre Yield Bu.	Mois- ture %	Lodged Plants Root %	Stalk %	Ear Height Grade
Northern Region					
Mo. 148	84.2	17.2	0.7	11.8	4.3
Ill. 200	82.4	16.6	0.4	11.3	4.2
U. S. 13	84.9	16.1	1.5	8.9	3.9
Yellow Hybrids	84.0	16.1	1.7	8.4	3.8
Central Region					
Mo. 148	71.1	17.3	16.1	6.7	3.8
Ill. 200	71.4	16.2	16.6	7.1	3.7
U. S. 13	73.2	16.2	8.6	6.5	3.6
Yellow Hybrids	73.6	16.4	12.0	5.8	3.6
Southern Region					
Mo. 148	69.4	15.7	17.4	16.6	3.5
Ill. 200	66.9	15.4	13.7	13.5	3.5
U. S. 13	69.2	15.8	13.5	11.9	3.3
Yellow Hybrids	68.4	15.8	16.2	14.2	3.4



Ohio C92
(WF9 x 38-11) (Ohio O7 x Hy)

Ohio C92 is a midseason yellow hybrid of the same maturity as U. S. 13 and is adapted to the same region of the state. It has many of the good features of U. S. 13 plus the advantage of having more stalk lodging resistance. It is also better suited to harvesting with a mechanical picker. Performance records of Ohio C92 and U. S. 13 show that the former appears to have a slightly higher yield and less stalk lodging in the Northern and Central regions, whereas, in the Southern region, U. S. 13 appears to yield more but has more stalk lodging. Ohio C92, therefore, is not so widely adapted as U. S. 13 and appears to be more specially suited for the Northern half of Missouri.

Farmers in the Northern half of the state who like U. S. 13 and harvest with a mechanical picker, will find Ohio C92 a more desirable hybrid.



Hybrid Ohio C92 is adapted to the region of Missouri indicated by the shaded area of this map.

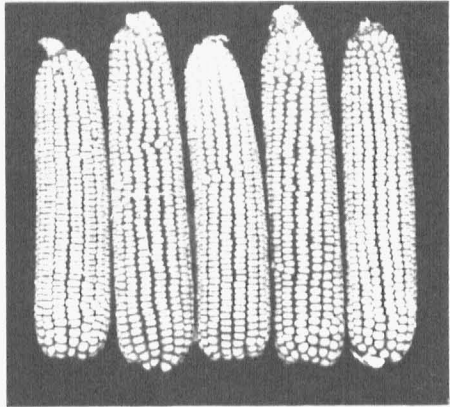


Table 3.--Average Performance Record for the Four-Year Period 1947, 1948, 1949, and 1950 Comparing Ohio C-92, U.S. 13, and Averages of Yellow Hybrids.

Hybrid Average	Acre Yield Bu.	Mois- ture %	Lodged Root %	Stalk %	Ear Height Grade
Northern Region					
Ohio C-92	85.5	15.3	0.5	5.3	3.8
U. S. 13	84.9	16.1	1.5	8.9	3.9
Yellow Hybrids	84.0	16.1	1.7	8.4	3.8
Central Region					
Ohio C-92	73.8	15.7	10.6	3.3	3.5
U. S. 13	73.2	16.2	8.6	6.5	3.6
Yellow Hybrids	73.6	16.4	12.0	5.8	3.6
Southern Region					
Ohio C-92	66.7	15.5	14.3	8.7	3.2
U. S. 13	69.2	15.8	15.8	13.5	3.3
Yellow Hybrids	68.4	15.8	16.2	14.2	3.4



U. S. Hybrid 35
(WF9 x 38-11) (R4 x Hy)

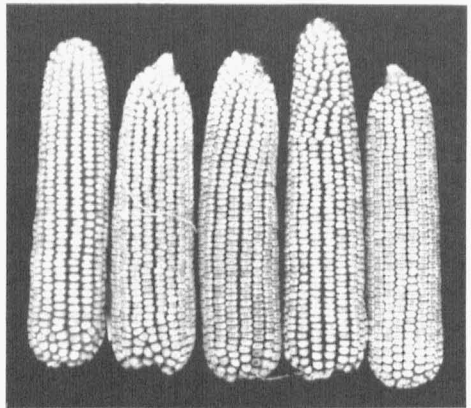
U. S. Hybrid 35 is a midseason yellow hybrid somewhat earlier than U. S. 13. It is desirable for early fall livestock feeding. It is not so high yielding as U. S. 13, since its earliness does not permit it to take full advantage of the growing season. This hybrid is recommended specifically for Northern Missouri and elsewhere in the state where it is necessary to plant corn very late.



Hybrid U. S. 35 is adapted to the region of Missouri indicated by the shaded area of this map.

Table 4.--Average Performance Record for the Four-Year Period 1947, 1948, 1949, and 1950 Comparing U.S. 35, U.S. 13, and Average of the Yellow Hybrids.

Hybrid Average	Acre Yield Bu.	Mois- ture %	Lodged Plants		Ear Height Grade
			Root %	Stalk %	
Northern Region					
U. S. 35	79.6	15.6	0.6	8.2	3.4
U. S. 13	84.9	16.1	1.5	8.9	3.9
Yellow Hybrids	84.0	16.1	1.7	8.4	3.8



Kan. 1639
(WF9 x 38-11) (K148 x K150)

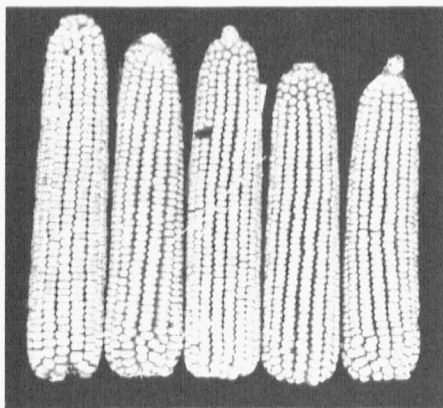
Kan. 1639 is a midseason yellow hybrid slightly later than U. S. 13 in maturity. It is especially adapted to Northern and Western Missouri where it has exceeded U. S. 13 in yields. Although the plants of Kan. 1639 are as tall as those of U. S. 13, the ears are borne lower on the stalk. It has slightly better stalk lodging resistance, drops fewer ears, has better husk cover, and is more drought resistant than U. S. 13. Drought conditions were not prevalent during the past four years but it is assumed that when these conditions again occur Kan. 1639 will be more outstanding than is indicated by its recent performance record. Kan. 1639 has a very good appearance and should be liked by farmers who have grown U. S. 13, but desire a lower-eared hybrid with more husk cover and more drought resistance.



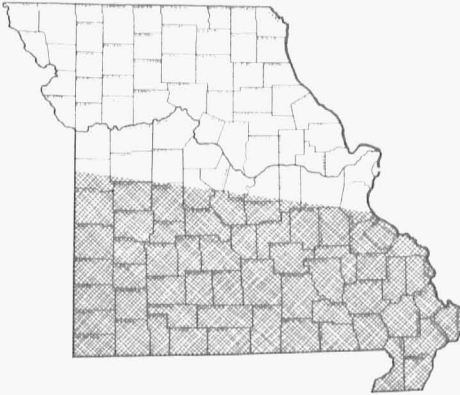
Hybrid Kan. 1639 has given good performance in the region of Missouri indicated by the shaded area of this map.

Table 5.--Average Performance Record for the Four-Year Period 1947, 1948, 1949, and 1950 Comparing Kans. 1639, U.S. 13, and Average of the Yellow Hybrids.

Hybrid	Acre Yield Bu.	Mois- ture %	Lodged Root %	Plants Stalk %	Ear Height Grade
Northern Region					
Kans. 1639	87.6	17.2	1.8	7.8	3.5
U. S. 13	84.9	16.1	1.5	8.9	3.9
Yellow Hybrids	84.0	16.1	1.7	8.4	3.8
Central Region					
Kans. 1639	77.6	16.6	15.1	3.8	3.2
U. S. 13	73.2	16.2	8.6	6.5	3.6
Yellow Hybrids	73.6	16.4	12.0	5.8	3.6
Southern Region					
Kans. 1639	68.0	16.3	15.8	9.6	2.9
U. S. 13	69.2	15.8	15.8	13.5	3.3
Yellow Hybrids	68.4	15.8	16.2	14.2	3.4



Mo. 8
(K4 x B2) (L3 x G)

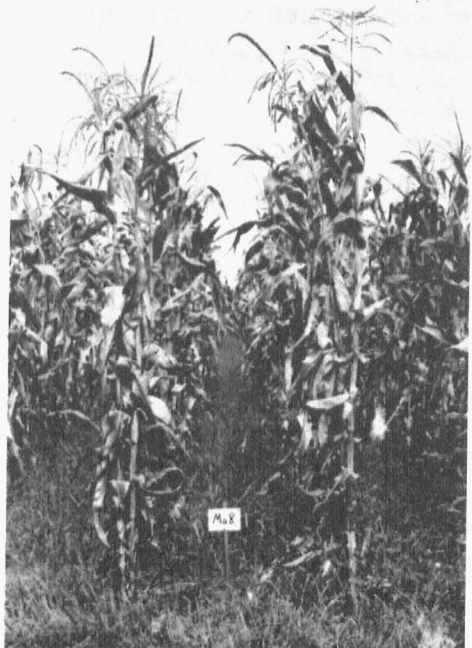
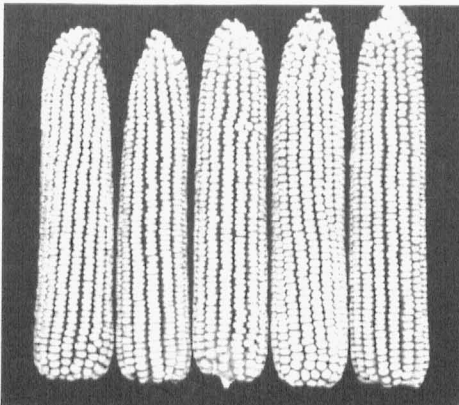


Hybrid Mo. 8 is adapted to the region of the state indicated by the shaded area of this map.

Table 6.--Average Performance Record for the Four-Year Period 1947, 1948, 1949, and 1950 Comparing Mo. 8, Mo. 148, U.S. 13, & Average of the Yellow Hybrids.

Hybrid Average	Acre Yield . Bu.	Mois- ture %	Lodged Root %	Plants Stalk %	Ear Height Grade
Central Region					
Mo. 8	70.9	18.8	17.4	10.6	3.9
Mo. 148	71.1	17.3	16.1	6.7	3.8
U. S. 13	73.2	16.2	8.6	6.5	3.6
All Yellow Hybrids	73.6	16.4	12.0	5.8	3.6
Southern Region					
Mo. 8	71.0	17.2	26.6	17.5	3.7
Mo. 148	69.4	15.7	17.4	16.6	3.6
U. S. 13	69.2	15.8	15.8	13.5	3.3
All Yellow Hybrids	68.4	15.8	16.2	14.2	3.4

Mo. 8 is a late yellow hybrid adapted to the Southern one-third of Missouri. It has many faults including a poor root system, frequent stalk lodging, and susceptibility to ear rots. It is an excellent yielder and produces well under adverse conditions. It is very difficult to harvest and to remove the shucks from the ears with a mechanical picker. Seed producers have difficulty with the single-cross seed parent K4 x B2 which is subject to a high amount of silk cut injury in some seasons. In spite of all the undesirable traits of Mo. 8, it still is a very popular hybrid in some areas of Southwest Missouri.



U. S. 523W
(K55 x K64) (Ky27 x Ky49)

U. S. 523W is a late white hybrid of about the same maturity as the yellow hybrid Mo. 8. Like U. S. 13, U. S. 523W is the product of the cooperative breeding of the Corn Belt experiment stations and the U. S. Department of Agriculture. U. S. 523W is now grown, and is eligible for certification in Kansas, Kentucky, and Missouri.

A desirable feature in the production of double-cross seed of this hybrid is that the parental single-crosses may be planted at the same time.

U. S. 523W has a high yield combined with good stalk lodging resistance. Its weak root system is its poorest feature but it compares favorably with other hybrids of the same maturity in this respect. It usually bears single ears, but will produce two ears per stalk under favorable conditions. Like most white hybrids, it is more difficult to shuck than yellow hybrids, but it can be husked easily with a me-



Hybrid U. S. 523W is adapted to the region of Missouri indicated by the shaded area of this map.

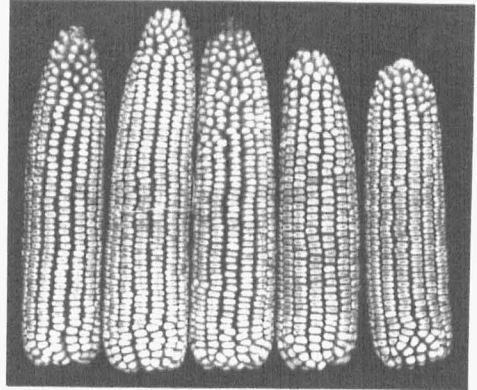
Table 7.--Average Performance Record for the Three-Year Period 1948, 1949, and 1950 Comparing U. S. 523W and Averages of White and Yellow Hybrids.

Hybrid Average	Acre Yield Bu.	Mois- ture %	Lodged Root %	Plants Stalk %	Ear Height Grade
Northern Region					
U. S. 523W	97.0	19.2	1.2	4.8	4.5
White Hybrids	97.1	18.7	0.9	4.7	4.4
Yellow Hybrids	90.6	16.2	0.3	8.5	3.9
Central Region					
U. S. 523W	93.1	17.6	7.8	4.7	4.1
White Hybrids	88.3	17.8	8.3	5.2	3.9
Yellow Hybrids	80.7	15.9	4.6	7.2	3.7
Southern Region					
U. S. 523W	91.7	16.0	12.7	6.5	3.9
White Hybrids	91.2	16.3	13.6	10.5	4.1
Yellow Hybrids	78.1	15.4	8.8	12.1	3.4



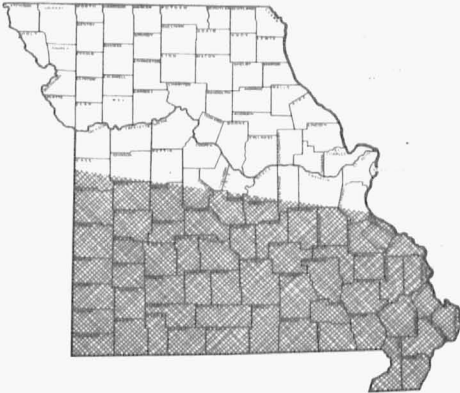
chanical picker. The ears have good shuck coverage and its grain type and quality are very suitable to the white corn milling trade.

This hybrid is especially adapted to the Southern half of the state but it may be grown in the Northern half, providing it is planted reasonably early. (At right: Ears of U. S. 523W.)



Mo. 804
(CI.7 x K4) (38-11 x CI.2IE)

Mo. 804 is a new late yellow hybrid approximately the same maturity as Mo. 8. It was released for the production of double-cross seed on a limited scale in 1950. This hybrid has been tested for three years in both Central and Southern Missouri. During this period, 1948 to 1950, it has an outstanding per-



Hybrid Mo. 804 is adapted to the region of the state indicated by the shaded area of this map.

Table 8.--Performance Record for Comparing Mo. 804 and Mo. 8 for the Three-Year Period 1948, 1949, & 1950.

Hybrid	Acre Yield	Mois- ture	Lodged Root	Plants Stalk	Ear Height
Average	Bu.	%	%	%	Grade
Central Region					
Mo. 804	86.8	16.9	6.1	7.9	4.2
Mo. 8	82.4	18.0	11.0	11.8	4.1
Southern Region					
Mo. 804	81.7	15.7	7.6	11.9	3.8
Mo. 8	74.0	16.5	15.9	16.0	3.6

formance record. In the Central region it averaged four bushels per acre more than Mo. 8 and in the Southern region it averaged 7.7 bushels more corn per acre than Mo. 8. Mo. 804 has about one-half as many root-lodged plants as Mo. 8 and about one-third less stalk-lodged plants. Mo. 804 is much easier to harvest with a mechanical picker. It is more vigorous than Mo. 8 with plant and ears slightly higher than Mo. 8. It is not subject to ear rots, which are so prevalent in Mo. 8. Mo. 804 should be a popular hybrid in Southern Missouri, unless some unforeseeable fault arises.