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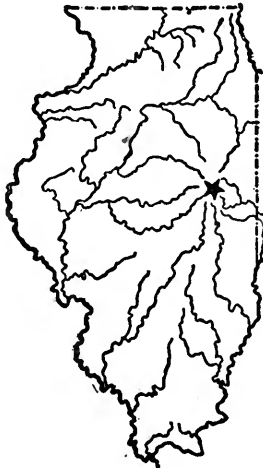
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UNIVERSITY OF ILLINOIS
Agricultural Experiment Station

BULLETIN No. 214

SPRING WHEAT FOR ILLINOIS

By W. L. BURLISON AND R. W. STARK



URBANA, ILLINOIS, FEBRUARY, 1919

SUMMARY OF BULLETIN NO. 214

CULTURE OF SPRING WHEAT.—The cultural requirements of spring wheat are very much the same as for winter wheat. Page 315

TIME TO SOW SPRING WHEAT.—Spring wheat should be seeded early. Page 315

FOUR-INCH AND EIGHT-INCH DRILLS COMPARED.—In so far as these experiments go, there is no evidence that the four-inch drill possesses any advantages over the eight-inch drill, with the ordinary rate of seeding. Page 316

VARIETY TESTS.—At Urbana, in central Illinois, Illinois No. 1 has out-yielded other varieties of spring wheat. At DeKalb, in northern Illinois, Marquis has given better yields than other spring varieties. Page 317

YIELDS AND VALUE OF SPRING WHEAT AS COMPARED WITH OTHER GRAINS.—In central Illinois spring wheat will not produce as large yields as will the hardy varieties of winter wheat.

Owing to the very serious partial winter-killing of fall-sown varieties of wheat at DeKalb, Marquis spring wheat has made a four-year average yield of 2.5 bushels per acre in excess of Turkey Red, which is one of the hardiest of the winter varieties.

At Urbana, in central Illinois, Turkey Red winter wheat, Oderbrucker barley, and Sixty Day oats have given greater monetary returns per acre than any spring wheat. At DeKalb, in northern Illinois, Wisconsin Pedigree barley has given better returns than any other spring-sown crop. Page 318

SPRING WHEAT FOR ILLINOIS

BY W. L. BURLISON, CHIEF IN CROP PRODUCTION, AND
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Within the last two years there has been a revival of interest in spring wheat, particularly in northern and to a lesser extent in central Illinois. The chief reason for this is the great demand for wheat made upon the American farmer by the war.

For the last two years the yields of spring wheat have been very encouraging; in fact, they have been better than had been expected. Spring wheat was grown quite commonly in northern Illinois many years ago, but for some reason not clear to all the practice was abandoned. For the central part of the state it would be unwise to be too enthusiastic about its production.

Spring Wheat Sections in Illinois.—For its best development, spring wheat requires a cool climate. Roughly speaking, the thirty-five counties in northern Illinois can safely include spring wheat in their systems of farming. Counties north of a line drawn between the southern boundaries of Kankakee and Mercer counties may be included in the primary spring-wheat belt of Illinois. Counties north of a line drawn between the southern boundaries of Edgar and Pike counties and south of the line mentioned above have produced very satisfactory spring wheat for the last two years.

CULTURE OF SPRING WHEAT

The cultural requirements of spring wheat are very much the same as for winter wheat. When spring wheat follows a small grain crop, fall plowing is certainly the best practice. This practice makes possible very much earlier seeding than would be possible if the land had to be plowed in the spring. The preparation of fall-plowed land is the same for spring wheat as it would be for any other spring-sown small grain. If spring wheat is to be seeded on stalk land, it would seem to be best to disk the land thoroly and seed then, rather than delay seeding for very long in order to plow.

TIME TO SOW SPRING WHEAT

Spring wheat should be sown early. In 1918 trials were made at Urbana, in central Illinois, to determine the effect of time of seeding upon the yield and quality of the crop. The varieties used were Illinois No. 1 and Marquis. The wheat was sown on ground that had been fall-plowed. At the time of the first sowing, the seed bed was in poor condition.

TABLE 1.—EFFECT OF DATE OF SOWING UPON THE YIELD AND QUALITY OF SPRING WHEAT

Plot	Date of planting	Illinois No.1			Marquis		
		Bushels per acre	Weight per bushel	Percentage scab	Bushels per acre	Weight per bushel	Percentage scab
		<i>bu.</i>	<i>lbs.</i>	<i>percent.</i>	<i>bu.</i>	<i>lbs.</i>	<i>percent.</i>
1	March 6.....	28.9	60.8	1.0	29.6	59.0	2.0
2	March 16.....	23.5	59.4	.8	27.3	58.0	6.0
3	March 29.....	21.8	58.8	5.6	23.8	56.5	7.4
4	April 10.....	....	....	....	22.2	54.8	14.8

The earliest seeding gave the highest yield with both varieties. Each successive seeding produced consistently lower yields. The quality of the crop was also materially affected by the time of seeding. Without exception, the later the seeding the lower the weight per bushel. Scab (*Fusarium roseum*) affected the grain from each seeding, but the early-sown wheat was much less affected. Illinois No. 1 showed considerably less infection than did Marquis.

These results constitute the data obtained in only one year's work, but since they are so consistent they deserve consideration.

FOUR-INCH AND EIGHT-INCH DRILLS COMPARED

In recent years there has been considerable discussion about the value of the drill which plants the grain in rows 4 inches apart, as compared with the drill commonly used which distributes the same amount of grain per acre, in rows 7 to 8 inches apart. Table 2 gives some information on this point.

At DeKalb the wheat was sown in four-inch drill rows in 1916 and 1918 by using an ordinary eight-inch drill and "splitting the middles" the second round. In 1917 the four-inch rows were seeded with a regular four-inch drill. The eight-inch rows were sown with the same drill by stopping every other cup and doubling the rate of seeding. At Urbana the four-inch drill was used both in 1917 and in 1918 in the same manner as described for DeKalb in 1917.

With the exception of the first year during which the experiment was tried at DeKalb, the eight-inch rows gave slightly greater

TABLE 2.—COMPARISON OF YIELDS OF SPRING WHEAT OBTAINED BY SOWING IN FOUR-INCH AND IN EIGHT-INCH DRILL ROWS¹
(Bushels per acre)

	DeKalb				Urbana		
	1916	1917	1918	Average	1917	1918	Average
Four-inch drill rows.....	36.3	22.8	27.5	28.9	32.2	23.9	28.0
Eight-inch drill rows.....	34.7	24.1	31.2	30.0	33.0	25.3	29.1

¹The yields given in this table are the averages of four trials each year, with the exception of those for Urbana, 1918. For that year the figures both for the four-inch and the eight-inch drill rows (standard rate of seeding) are the averages of three trials.

yields on both fields. The average yield at DeKalb for the three years was 1.1 bushels per acre in favor of the eight-inch rows. At Urbana the average for two years was also 1.1 bushels per acre in favor of the eight-inch rows.

Altho it is not yet possible to submit sufficient data upon which to base statements regarding the relative desirability of different rates of seeding, the present available information indicates that when the eight-inch drill is used for spring wheat, a satisfactory rate of seeding is from one and one-half to two bushels per acre.

VARIETY TESTS

CENTRAL ILLINOIS

TESTS AT URBANA, IN CHAMPAIGN COUNTY

The Illinois Experiment Station began a study of spring wheat at Urbana, in Champaign county, in 1912. In that year the Station obtained some spring wheat from a Champaign county farmer who had grown spring wheat with considerable success for a number of years. The original name of the variety is unknown. This wheat proved to be of sufficient worth in the trials to warrant distributing the surplus on a small scale in 1917. This variety has been designated as "Illinois No. 1." It is a bearded variety and produces rather large, long heads. The straw is somewhat coarse and inclined to lodge.

The other three varieties; namely, Marquis, Red Fife, and Durum, were introduced into the trials in 1915. The yearly yields and the average yield of each variety for the last four years are reported in Table 3.

Illinois No. 1 gave an average yield for the last four years of 29.3 bushels per acre, which is 4.7 bushels per acre more than was made by Durum wheat, its closest competitor, and 7.9 bushels per acre more than Red Fife. Marquis produced almost 5 bushels less than Illinois No. 1.

TABLE 3.—YIELDS OF VARIETIES OF SPRING WHEAT GROWN AT URBANA¹
(Bushels per acre)

Variety	1912	1913	1914	1915	1916	1917	1918	Average for last four years
Illinois No. 1. . . .	24.7	18.2	13.9	19.6	27.9	43.1	26.7	29.3
Durum. . . . .	....	....	....	14.4	24.6	31.9	27.6	24.6
Marquis. . . . .	....	....	....	14.6	21.8	36.3	25.1	24.4
Red Fife. . . . .	....	....	....	6.4	18.3	36.6	24.5	21.4

¹The yields reported are the average of two trials of each variety in 1915 and 1916, and of four trials in 1917 and 1918.

"Illinois No. 1" is a tentative name for this variety of spring wheat; in Bulletin 195 it is described as "home-grown."

NORTHERN ILLINOIS
TESTS AT DEKALB, IN DEKALB COUNTY

Spring wheat has been grown on the crop experiment field at DeKalb since 1907. In the early years a number of varieties were tried. Of this number Kubanka and Saskatchewan Fife were the only ones grown for a period of more than two years. These varieties appeared to be about equally adapted to northern Illinois, and under favorable conditions made quite satisfactory yields. A rather more systematic study of the adaptability of spring wheat for northern Illinois was begun in 1915. That year Marquis and Blue Stem were introduced, and two years later Durum and Illinois No. 1. Table 4 gives the yields of these varieties.

TABLE 4.—YIELDS OF SPRING WHEAT GROWN AT DEKALB¹
(Bushels per acre)

Variety	1915	1916	1917	1918	Four-year average	Two-year average
Marquis	30.6	34.7	32.0	42.0	34.3	37.0
Blue Stem	19.6	21.3	28.4	29.6	24.7	29.0
Durum . . . . .	....	....	17.2	44.4	....	30.8
Illinois No. 1 . . . . .	....	....	20.5	37.5	....	29.0

¹The yields reported are the average of four trials each year.

It will be noted that the average yield of Marquis for the four years was 34.8 bushels per acre, which is 10.1 bushels per acre more than the yield of Blue Stem for the same period. The average yield of Marquis for the two years 1917 and 1918 was 37 bushels per acre. Durum ranked second, with an average yield of 30.8 bushels per acre, and Blue Stem and Illinois No. 1 each produced an average of 29 bushels per acre.

**YIELDS AND VALUE OF SPRING WHEAT AS COMPARED
WITH OTHER GRAINS**

The data given in the following tables are suggestive of the relative monetary value of spring wheat as compared with several of the other commonly grown grain crops (winter wheat, oats, and barley). The values are based upon the average August price on the Chicago market for the ten years ending 1913. These prices were: wheat, 92.3 cents per bushel; oats, 37.8 cents; and barley, 60.2 cents. Since the beginning of the war, prices have become unusually high and so subjected to arbitrary control that recent values afford no satisfactory basis for comparison.

In the Urbana trials, Turkey Red winter wheat gave a four-year average yield of 44.6 bushels per acre valued at \$41.16, while Illinois

No. 1, the best yielding variety of spring wheat, produced 29.3 bushels per acre worth \$27.04. Oderbrucker barley produced 57.2 bushels per acre and ranked second in the value of the crop. Sixty Day oats ranked third, and Illinois No. 1, fourth.

TABLE 5.—URBANA: YIELD AND VALUE OF SPRING WHEAT AS COMPARED WITH TURKEY RED WINTER WHEAT, SIXTY DAY OATS, AND ODERBRUCKER BARLEY

Variety	Four-year average, 1915-1918	
	Bushels per acre	Value per acre
Illinois No. 1.....	29.3	\$27.04
Durum.....	24.6	22.70
Marquis.....	24.4	22.52
Red Fife.....	21.4	19.75
Turkey Red (winter).....	44.6	41.16
Sixty Day oats.....	78.5	29.67
Oderbrucker barley.....	57.2	34.43

The spring grains were grown in a four-year rotation of clover or soybeans, corn, corn, and spring cereals. The Turkey Red winter wheat was grown in a four-year rotation of clover, wheat, corn, and oats. The comparison is not entirely fair for the spring cereals, since in the rotation in which they are grown they are removed as far as the system will permit from the legume crop, while the winter wheat immediately follows the legume crop. There is also some difference in type of soil composing the fields devoted to the two rotations.

Notwithstanding the above mentioned advantages which the winter wheat has over the spring wheat, the comparison is instructive.

TABLE 6.—DEKALB: YIELD AND VALUE OF SPRING WHEAT AS COMPARED WITH TURKEY RED WINTER WHEAT, SWEDISH SELECT OATS, AND WISCONSIN PEDIGREE BARLEY

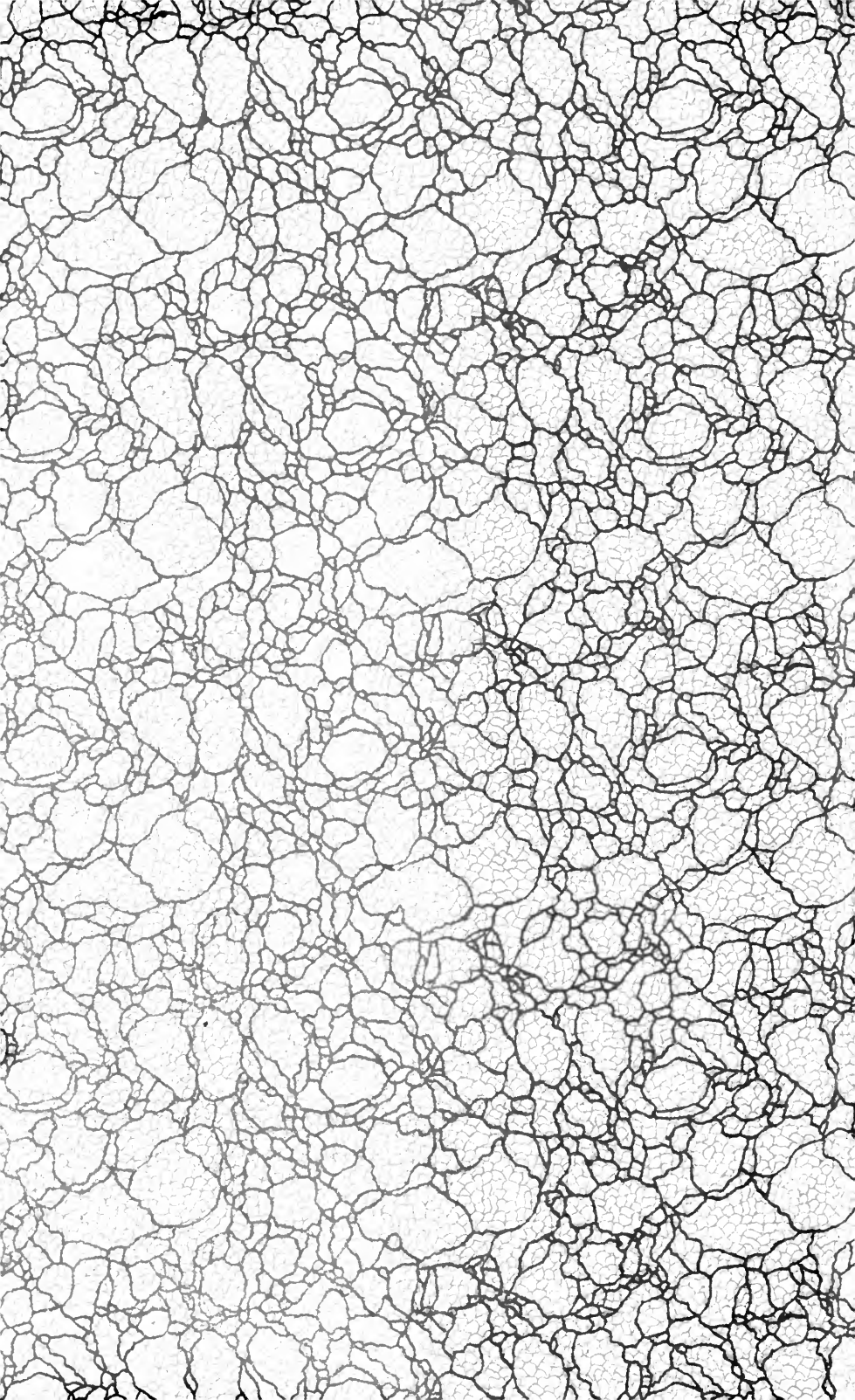
Variety	Four-year average, 1915-1918		Two-year average, 1917-1918	
	Bushels per acre	Value per acre	Bushels per acre	Value per acre
Marquis.....	34.8	\$32.12	37.0	\$34.15
Blue Stem.....	24.7	22.80	29.0	26.77
Durum.....	....	....	30.8	28.43
Illinois No. 1.....	....	....	29.0	26.77
Turkey Red (winter).....	32.3	29.81	26.3	24.27
Swedish Select oats.....	68.8	26.00	75.4	28.50
Wisconsin Pedigree barley....	62.9	37.87	69.3	41.72

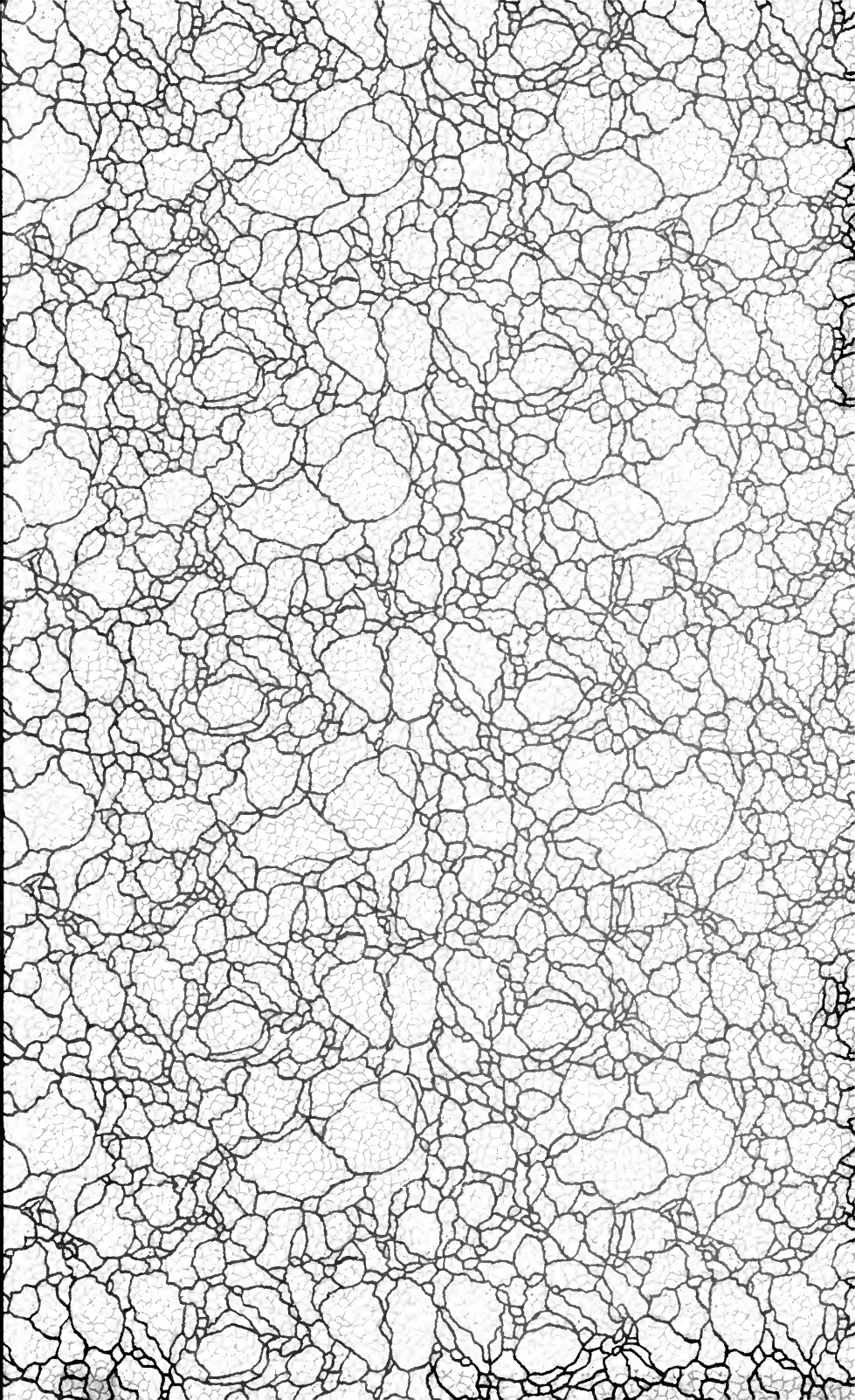
At DeKalb, Marquis spring wheat gave a four-year average of 34.8 bushels per acre, which is 2.5 bushels per acre more than was yielded by Turkey Red. Assuming the grade to be the same, the Marquis wheat was worth \$2.31 more per acre. During the last two years (1917 and 1918), Marquis yielded on the average 37 bushels per acre, or 10.7 bushels per acre more than Turkey Red, and was worth \$9.88 more per acre. Wisconsin Pedigree barley proved the best paying crop of the several cereals tried.

These grains were grown in a four-year rotation consisting of clover, corn, spring cereals, and winter wheat. They were all grown in the same rotation, where the land received the same soil treatment.

Perhaps an even more direct comparison of the relative value of spring and winter wheat may be shown by the experience of the last two seasons (1917 and 1918) at DeKalb on certain plots devoted to winter wheat. Certain varieties of the winter wheat were so seriously winter-killed that it was necessary to disk them up in the spring and to sow spring wheat in their stead. The Marquis variety of spring wheat was used for this purpose. The yields of Marquis so substituted, and of Turkey Red, one of the winter varieties which survived, grown on the same series of plots, were as follows: In 1917: Marquis, 24.6 bushels per acre; Turkey Red, 29.7 bushels. In 1918: Marquis, 36.1 bushels; Turkey Red, 22.9 bushels. The averages for the two years show Marquis yielding 30.3 bushels per acre, as compared with 26.3 bushels produced by Turkey Red.







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