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o 10 years under the prevailing methods f treatment. The average wheat yield f the State could not, therefore, be taken s representing the full or normal wheat roduction. It might be expected that ields of the whole State would steadily mprove coincidentally with the improvement in farming methods in the mallee reas.' To gain a more accurate view of he real improvement made they might onsider what had happened in an old-stablished wheat area, where the acreage nder cultivation had not materially ltered during the period under review. For that purpose, he would briefly consider the developments that had taken lace in the Wimmera district in Victoria, here for the past 33 years the area under heat had remained fairly stationary, viz., 50,000 acres. The accompanying graph howed the relationship between wheat ield and rainfall for the past 3 years. From 1892 to 1903 he winter rainfall graph in inches as consistently above the line representing wheat yield in bushels per acre, but he two lines showed a gradual convergence. From 1903 till 1914 the lines folowed one another very closely. Since 915 the graph of wheat yield per acre howed steady divergence from the graph f rainfall. That graph showed very learly the marked progress in wheatrowing that had taken place in the Wimmera during the past 10 years. For the eriod 1892-1901 the Wimmera wheatarmers averaged 7.08 bushels per acre on winter rainfall of 11.92. Thus they eaped .59 bushels per acre for each inch f rainfall received. Throughout that 0-year period their average yields were ss than the average yields of the State. During the last 10 years, however, the verage yield had been 20.77 bushels per cre on a rainfall of 12.99. Thus, during he last 10 years they had reaped 1.60 ushels of wheat for each inch of winter ainfall. The average yield was nearly hree times as great as it was 20 years go. The main factor which had brought bout that improvement was the almost niversal adoption of the following practices which were demonstrated very clearly t the experimental station established by he Victorian Department of Agriculture t the Longerenong Agricultural College:— . The adoption of late seeding, which in he Wimmera invariably led to cleaner rops, a marked increase in the proportion f grain to straw, a reduction in the water ost of grain produced, and a substantial ncrease in the yield per acre as compared with early sown crops. 2. The recognition of the value of fallowing, and f the thorough working of the fallows to etain soil moisture and promote nitrification. Summer fallowing, or the adoption of a 15-months' fallow, was very eneral in the Wimmera. 3. The use of eavy dressings of water soluble phoshate, especially where cultural methods were thorough. Heavy dressings of superphosphate, when supplemented by conerved soil moisture and abundance of itrates, led to increased wheat yields at lowered water cost. 4. The general use f a variety of wheat—Federation—which nder actual field tests had proved to e better suited to Wimmera conditions han any other variety. Many farmers n the Wimmera are reaping bags per acre where they reaped bushels per acre years go. The following tables show the verage wheat yield, composite seasonal ainfall, and ratio of wheat yield to rainall for three decades in South Australia, Victoria, and the Wimmera district:—

Average Wheat Yield Per Acre.

	1892-1901. 10 Years. Bushels.	1903-13. 11 Years. Bushels.	1915-24. 10 Years. Bushels.
outh Australia ..	4.74	10.02	12.45
ictoria	7.65	11.74	14.58
immera	7.08	13.13	20.77

Average Seasonal Rainfall.

	1892-01. 10 Years. Inches.	1903-13. 11 Years. Inches.	1915-24. 10 Years. Inches.
outh Australia ..	11.55	12.05	12.73
ictoria	11.49	11.88	12.91
immera	11.92	13.00	12.99

Ratio—Bushels Per Inch of Seasonal Rainfall.

	1892-01. 10 Years.	1903-13. 11 Years.	1915-24. 10 Years.
outh Australia ..	.41	.83	.98
ictoria	.67	.99	1.13
immera	.59	1.01	1.60

The Maximum Possible Production?

It had been shown, continued the doctor, hat at present South Australian farmers btain 1 bushel, the Victorian farmers 1.13 bushels, and the Wimmera farmers 1.60 bushels per acre for each inch of rain alling between April and October. They ould next enquire what yield of wheat er acre was possible if production were ushed to the limit? It was not contended hat the question could be answered with ny degree of accuracy, but there was much evidence to show that the rainfall of he wheat belt was sufficient to give yields considerably greater than those obtained t present. He had set out the detailed evidence for that belief in a bulletin on the "Water Requirements of Farm Crops," published by the Victorian Department of Agriculture. Investigations covering a period of six years were made at Rutherglen, Victoria, to determine how much rain had to pass through a crop to produce a ton of dry matter, grain, and straw, and to produce a bushel of wheat. During those investigations it was found that the water requirement of wheat was not constant, but varied considerably with the season. Thus the average water requirement of wheat during the drought year 1914 was found to be double that of the following season. It was found that the amount of rainfall required to produce

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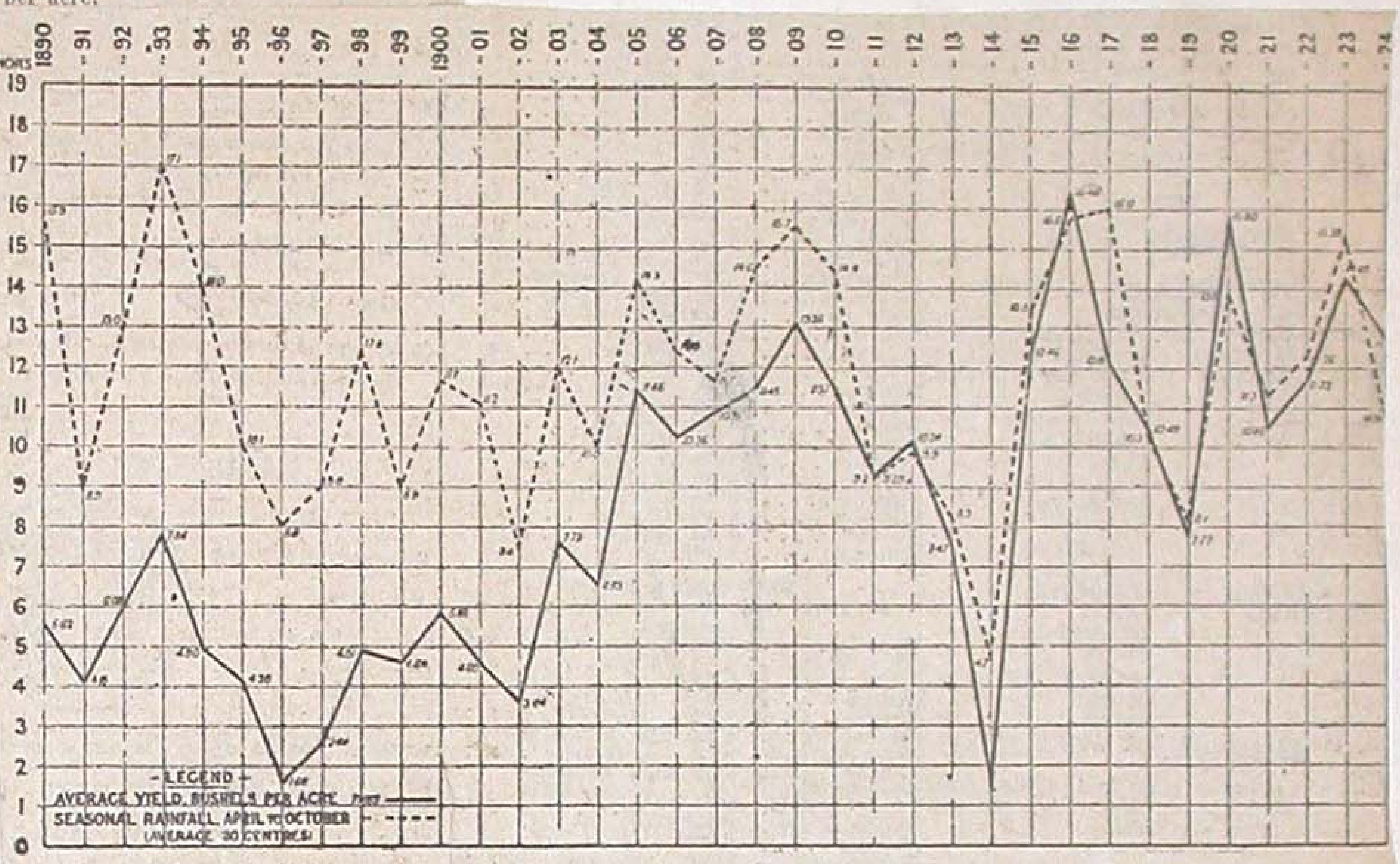
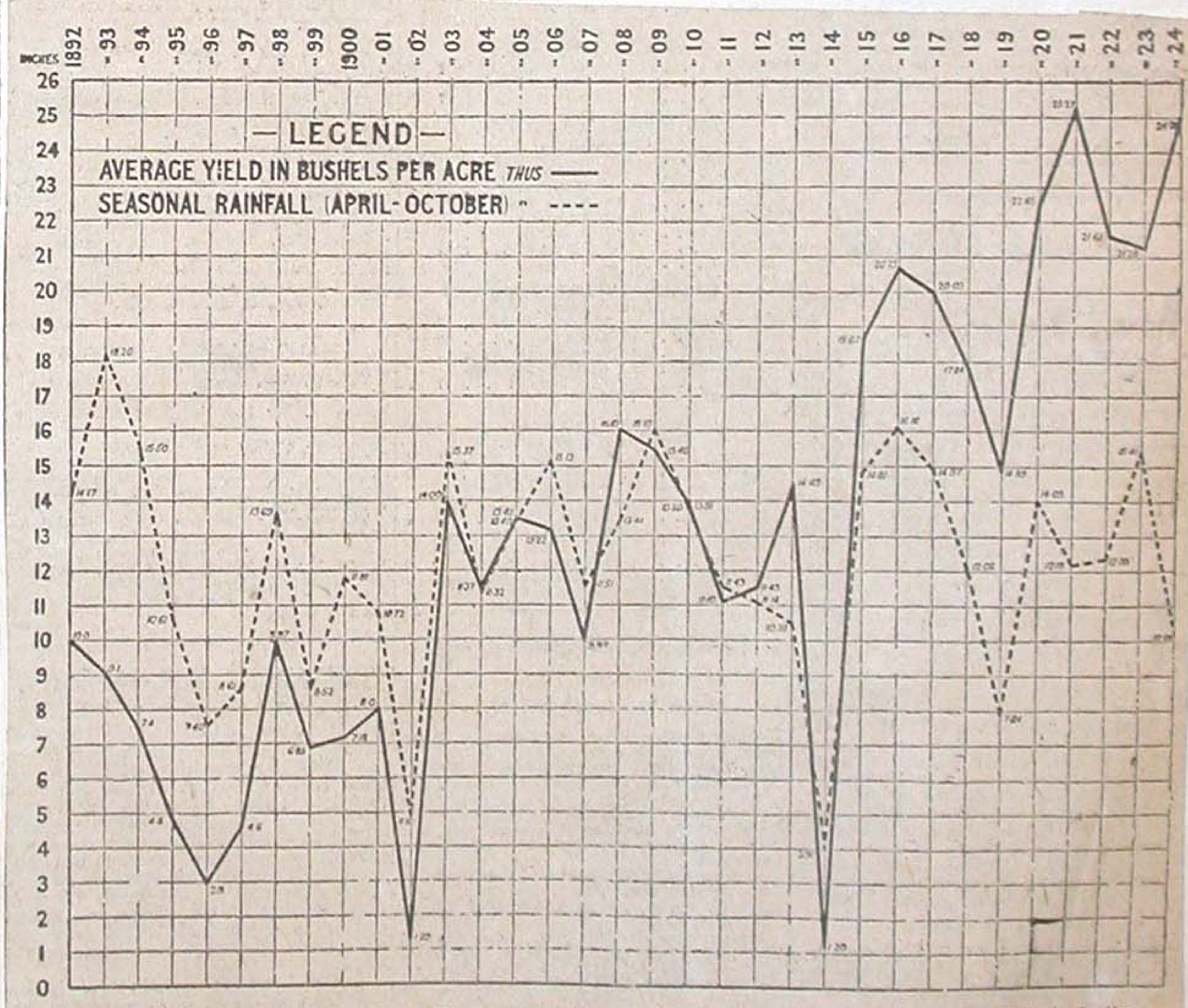
say, a ton of wheat varied considerably with the season, and was dependent on the intensity of the atmospheric conditions, i.e., air temperature, velocity of wind, and dryness of the atmosphere at the stage of maximum transpiration of the crop, which usually occurred in October and November. Over a period of six years it was found that 1,067 tons of water had to pass through a crop of wheat to produce 1 ton of grain. Now, an inch of rain falling on an acre of land weighed 101 tons. Hence 10.53 inches of rain had to be used by the crop in order to produce 1 ton of wheat, so that each inch of rain produced over an average of six seasons 3.54 bushels of wheat.

They might assume, therefore, that with moderate rainfalls, each inch of rain was capable of giving a yield of 3½ bushels per acre.



Graph showing the relationship between the average wheat yield and seasonal rainfall in South Australia for the years 1890-1924.



Graph showing the relationship between the average wheat yield and seasonal rainfall in Wimmera, Victoria, in the years 1892-1924.