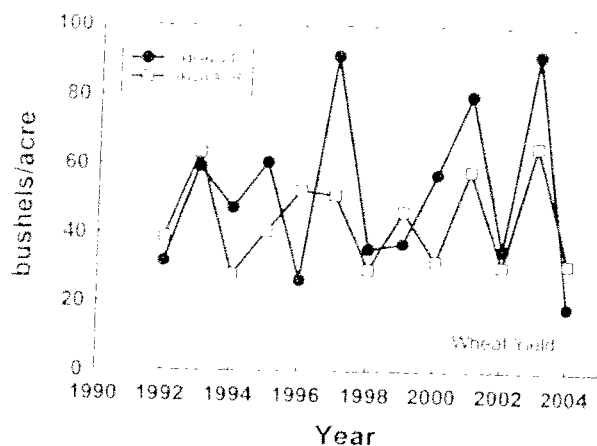


How Wheat Responds to Water

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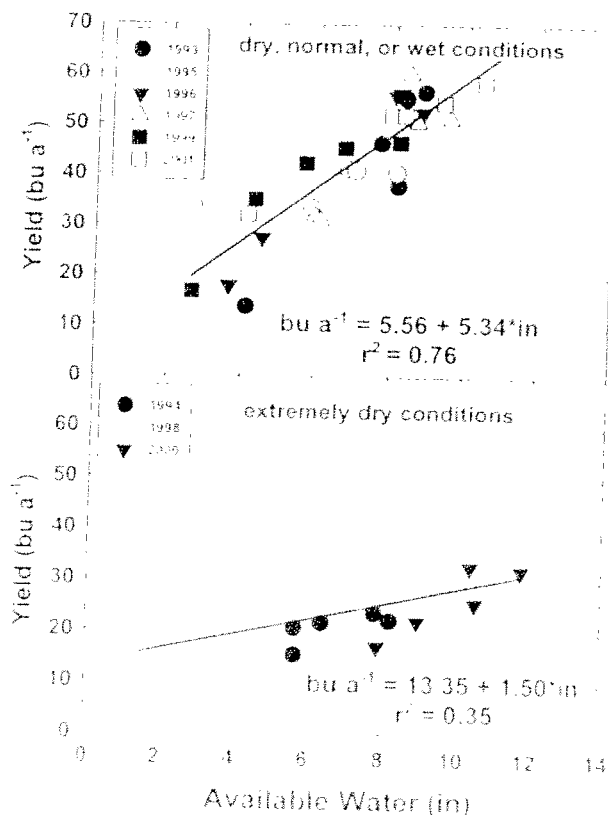
Winter wheat is well adapted to the climatic conditions of the central Great Plains. But dryland yields can vary widely from year to year due to the strong influence of water (soil water, timing and amount of precipitation, and total seasonal water use) on grain production.

Grain yields recorded at Sidney, NE (average of the five highest yielding varieties in the University of Nebraska variety trial) show a range of 19 to 92 bu/acre (average 52 bu/acre) over the time period of 1992 to 2004. At the Central Great Plains Research Station near Akron, CO, the wheat yields in an alternative crop rotation study ranged from 66 to 28 bu/acre (average 44 bu/acre). While there are some influences on yield from insects, weeds, diseases, frost, and hail, most of the variation noted in the graph arises from differences in the amount of water available for crop production.



One of the water factors important to winter wheat grain production is stored soil water. Generally, wheat yield increases by 5.3 bu/acre for every inch increase in stored soil water available at planting time. But under extremely dry conditions [when total pan evaporation in April, May, and June is greater than precipitation by 25 inches], wheat yield increases by only 1.5 bu/acre for every inch increase in stored soil water. These very dry conditions occur in about 13% of the years of record.

The amount of stored soil water is determined by how much soil water the previous crop used, how much precipitation fell during the non-crop period, and how efficiently that precipitation was stored. Precipitation storage efficiency (PSE) increases with tillage reduction and increases with amount of crop residue on the soil surface. PSE is higher during the fall, winter, and spring than during the warm months of summer.



WHEAT TECHNOLOGY CONFERENCE Proceedings Water and Winter Wheat



Monday, February 28, 2005
Holiday Inn: I-80, Exit 59
Sidney, Nebraska (50)
9 a.m. - 4 p.m.

Tuesday, March 1, 2005
Eagles Club: W. 3rd St. (30)
Alliance, Nebraska
9 a.m. - 4 p.m.

Thursday, March 3, 2005
Perkins County Fairgrounds
2nd & Garfield (20)
Grant, Nebraska
9 a.m. - 4 p.m.

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