EFFECT OF CLIMATE ON NITROGEN CONTENT OF MAIZE,
BARLEY, AND RED CLOVER

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The purpose of this investigation was to ascertain what differences in chemical composition of crops, if any, are due to weather and climate. The experiment stations at Ashland and Madison, Wisconsin, were chosen as sites for growing the crops in question. The climatic conditions at these two points, while not radically different, differ quite markedly with regard to temperature, length of season, precipitation, and number of clear days.

The difference in latitude between the two points is 3 degrees and 35 minutes, that of altitude 326 feet. These differences, together with the influence of Lake Superior, a large body of water whose waters are always cool, profoundly affect the climate, as will be noted from Tables 1, 2, and 3 for the 10-year period of 1918 to 1927, inclusive. The length of time between killing frost at Ashland averaged 111.3 days and at Madison 168.9 days, a difference of over 57 days. For the growing season, April to September, there is a difference of over 6 degrees F in favor of Madison. Rainfall for the growing season is nearly 3 inches greater at Madison, but as a result of decidedly higher average temperature at the latter place, with consequent greater evaporation, the usable rainfall for crop production at Ashland is probably as great as at Madison. The total number of clear days at the Ashland station averages 142.4 days, as compared with only 95 days at Madison.

The greater number of daylight hours for the summer season, too, should have some influence on the development of crops and quite possibly on the nitrogen-carbohydrate ratio. Taking into consideration the climatic factors mentioned, there appear to be grounds for believing that considerable differences in chemical composition may exist in plants grown at two different points as widely separated as Ashland and Madison. Whether the claim often made by stockmen, that northern pastures, hays, and grains have a greater nutritive value is justified remains to be proved experimentally.

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