

MANAGING ALFALFA PRODUCTION WITH LIMITED IRRIGATION WATER

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ABSTRACT

To investigate the effects of midsummer water management on alfalfa productivity, a large-scale field trial was conducted on a Hanford sandy loam at the Kearney Agricultural Center in Fresno County, California. Treatments included a standard of two irrigations between cuttings, an “excess” treatment of three irrigations between cuttings, a single irrigation between cuttings, an irrigation skip in July and August, and a July termination of irrigation until the following spring. Hay yields were greatly reduced by deficit irrigation and cutoff treatments. After two years of differential irrigation, all treatments were irrigated twice per cutting for the third year of production during which all treatments produced as well as the standard method. We concluded that alfalfa is impacted by water deficits, but not to the degree expected.

Key Words: alfalfa, irrigation, management, drought, hay quality, water-use

INTRODUCTION

In the central and southern San Joaquin Valley, the water requirement for alfalfa can range between 40 to 50 inches per year. Unlike some crops, which can be stressed for water at particular growth stages with no decrease in yield, alfalfa forage yields are directly related to available soil moisture for vegetative growth. Although yields are decreased by moisture stress, alfalfa plants survive and recover once water is again supplied.

Economics. From an economic viewpoint, water can be the largest single cost in alfalfa production, and the profitability of an alfalfa operation can depend on the price of water. Based on experience with seed alfalfa, it is known that the plant can survive very dry, abusive conditions. In this paper, we report a trial that was initiated to evaluate severe alfalfa hay management options to be faced if the cost of water was high or if, in the case of drought, the water supply was limited. The trial was conducted during 1992-93.

PROCEDURES

Experimental. A field trial was conducted at the Kearney Agricultural Center in Fresno County on a Hanford sandy loam soil with scattered hardpan. Each plot consisted of a check 24 ft. x 857 ft. and treatments, listed below, were replicated four times. The experimental design was a randomized complete block design. ‘CUF 101’ alfalfa was planted September 18, 1992, at a

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