

Nutrition Survey in Arizona Citrus¹

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Introduction

For some time now many citrus producers in Arizona have depended upon California recommendations for fertilization programs. Some of the growers have developed their own fertilization protocols with mixed success. The primary objective of the proposed work is to first survey what growers have been doing in the recent past with fertilization, what their documented and perceived results are and using California recommendations as a standard eventually test one or more protocols based on grower and investigator knowledge and experience.

Survey Criteria

The survey was published in the *Citrus Newsletter*. With the published survey, a request for E-mail addresses and Fax numbers was made to facilitate our communication during this process. After receiving survey responses, some growers were selected to obtain additional information.

The survey requested protocols that include amount and rate of fertilization, and methods of application. Based upon survey response and additional discussion with Arizona growers, protocols were formulated for testing against California recommendations in the following year.

Survey Results

The response to the nutrition survey was good. Although only 16.3% of the those receiving the mailing responded, 32,422 acres of citrus was represented in the survey. Your responses are summarized as follows.

Twenty-nine percent of the respondents owned or managed 1000 or more acres of citrus. They handle 84% of the acreage. Another 29% of the represented growers own 200 or fewer acres. Production acreage greater than 200 and less than 1000 was acknowledged by 18.5% of the respondents. The remaining 18.5% declined to give their production acreage.

Forty-nine percent of you own or manage citrus in Yuma county, 35% in Maricopa county, and 13.5% in Pinal county. Lemons are produced by 71% of the growers responding, with grapefruit, navel, valencia, and mandarin production by, 61, 37, 58, and 71 % of you, respectively. This survey did not determine the distribution of that acreage for each grower. We merely determined the major types of citrus in production.

The majority of the respondents (82%) use flood irrigation, with 16%, 21%, and 26% of you using, furrow, drip, or microsprinkler irrigation. Many of respondents use their irrigation system in fertilizer application (76 %), with 8% water running their fertilizer, 24% using fertigation, and the other 44 % unspecified. The majority (68%) of the respondents also apply their fertilizers foliarly. Since 66% of you apply nitrogen as low biuret urea, this was not surprising. Seventy-three percent of you apply phosphorus, primarily as a 10-34-0 formulation. Only 63% of

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the respondents applied sulfur, primarily for soil acidification. A number of the respondents (45%) did not report the use of several micronutrients or potassium. Those that did, applied them foliarly and often in chelated forms.

Most fertilization decisions (74%) are made on the basis of observation and previous successful seasons. Half of the growers responding use soil and tissue analyses for determining when and how much to fertilize. Only 5% of you feel that current recommendations can be relied upon for your fertilization decisions.

Almost half of the respondents admitted their dissatisfaction with their current fertilization programs. They expressed concern over the use of micronutrients, balance of materials applied, timing of application, cost of application, and ultimately the effect of fertilization on orchard productivity. After talking with several growers individually, it was apparent that research in the area of fertigation is an important concern, as well as water use and availability.

Clearly, there is a need for our careful consideration of the fertilization requirements of growers in Arizona. It is also apparent that we need to take a leadership role in meeting this need. After a careful assessment of the current fertilization programs in Arizona, we are beginning field trials to develop recommendations that are most appropriate for the growing conditions in Yuma and Maricopa counties. These trials are based upon your experience and successes, as well as the recommendations of California and Arizona. The following issues that impact the choice of application protocol that we are pursuing: application cost, application timing and frequency, reduced water use, and yield optimization.

We are making applications with *Unocal* + in our trials, at several times during the year, making comparisons to potassium nitrate application. In addition, we are continuing studies that use novel methods for the application of micronutrients. Others at U of A are developing recommendations for water use and fertigation. As these studies progress, we will be sharing that information with you either through the *Citrus Newsletter* or through this publication.