

RESULTS & DISCUSSION

Presenting the case for a certain point of view is often not that difficult. Finding enough quotations to support theories and concepts does not necessarily "prove" anything. I wanted to demonstrate the actual practices that predominate in the industry in which I worked for over 20 years. I reviewed the actual sales records of fertilizer use in the study area to show what materials are actually being applied. Then I conducted a survey of fertilizer dealer personnel - those who are in regular contact with customers - to see what perceptions and practices contribute to fertilizer use in northern California. I wanted to determine the education level and needs of the industry - because I knew that this was at the heart of the problem.

Sales Records of Fertilizers in Northern California

I reviewed sales records (which are submitted by fertilizer dealers quarterly) in the offices of the California Department of Food and Agriculture (CDFA) in Sacramento. I tabulated these records by county for the years 1975-1995, then combined the figures to show the fertilizer use trends in northern California.

Nitrogen (N) is by far the most applied nutrient of the three major nutrients based on sales averaged over 21 years. In Contra Costa, Lake, Mendocino, Napa and Sonoma Counties, N makes up 62.3% of the total fertilizers sold, P - 22.8%, and K - 14.9% (Figure 2). This coincides with my observations from working with farmers in the area - nitrogen is the most commonly applied fertilizer. When farmers talk about applying fertilizer, they are talking about nitrogen. Hauck (1984) called nitrogen the most commonly used fertilizer nutrient in the world because it is required by plants in large quantities. My survey showed the same trend in Northern California.

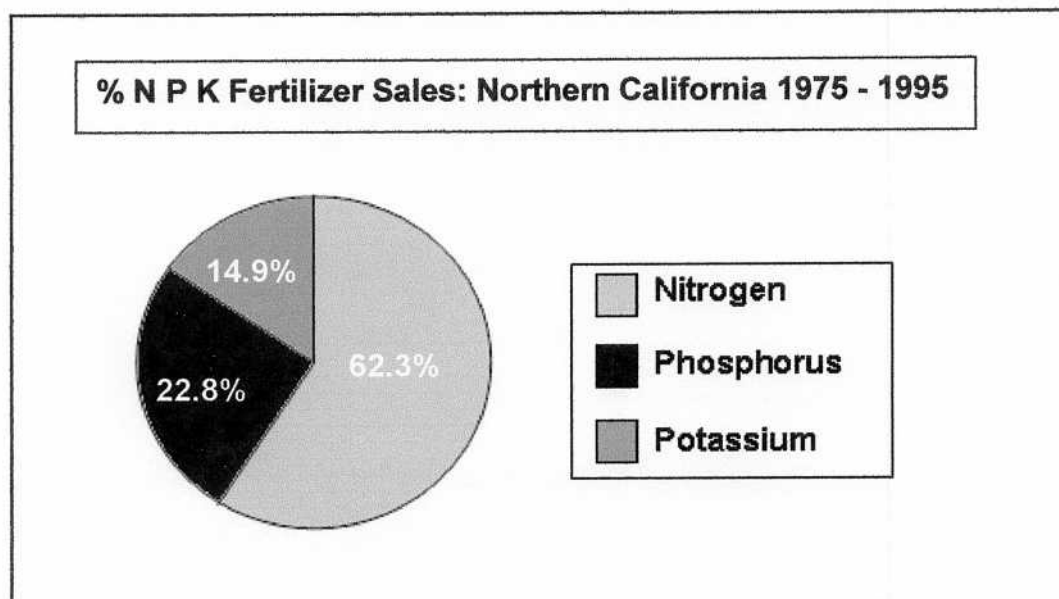


Figure 2. Average sales of N-P-K fertilizers in Contra Costa, Lake, Mendocino, Napa, and Sonoma Counties. Data derived from CDFA (1975-1995) Fertilizing materials annual tonnage report.

The agricultural industry in the United States also relies heavily on nitrogen fertilizers. The trend over the last 35 years in the U. S. shows a gradual but continual rise in N fertilizer use, as shown in Figure 3. Nitrogen rose from 36.7% to 55.1% as the percent of total N-P-K. During that same period from 1960-1995 the total tons of N fertilizers consumed quadrupled. Interestingly, northern California uses a higher percentage of nitrogen than the nation taken as a whole. Nitrogen accounted for 62.3% of total N-P-K in California and 52.0% in the United States.

Is this reliance on nitrogen over other nutrients appropriate for our crops and soils in northern California? Later I will compare specific requirements of tree fruits and vines with this trend towards over reliance on nitrogen. Since increased pest and disease problems, pollution, and quality considerations are all linked to fertilizer use, appropriate fertilization is an important component of sustainable farming and quality production.

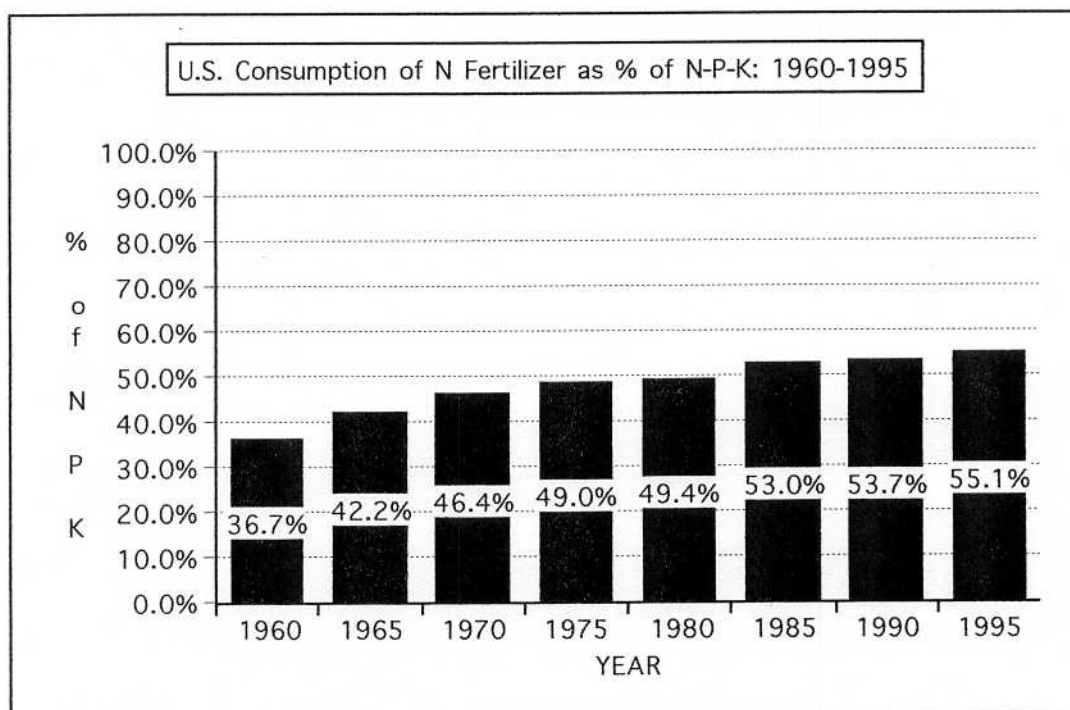


Figure 3. Data derived from University of Kentucky (1997) National Fertilizer Tonnage, showing increasing use of nitrogen fertilizers over the last 35 years.

Calcium (Ca) is an important nutrient for agricultural production. Although it was often neglected in the past, Ca is now receiving more recognition for its importance in soils and plant nutrition. Traynor (1980, p. 51) predicted that: "...over the next 100 years more calcium will be applied to agricultural crops than any other nutrient." Northern California farmers are using more calcium amendments than in the past, as shown by the CDFA sales figures (Figure 4). I believe this trend is due to increased knowledge of soil science, more use of soil testing, and better application technology.

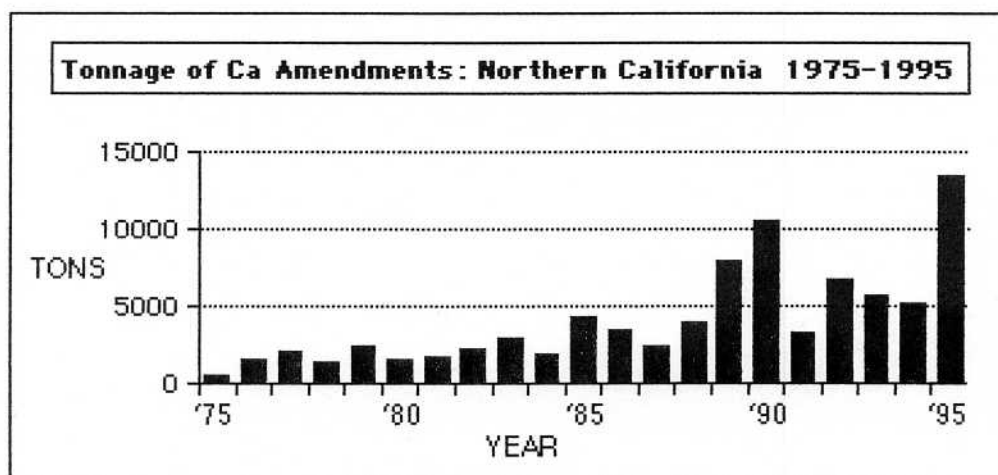


Figure 4. Data derived from CDFA (1975-1995) Fertilizing materials annual tonnage report. Increasing use of calcium amendments.

Dealer Survey: The Need for Training in the Industry

I have been able to compile a very complete survey; 100% of the registered fertilizer dealers located in the northern coastal counties responded. The survey is summarized in Appendix G. It definitely indicates the need for additional training. Although 60% of companies in the area have 1 or more people with soil science training, only half of the companies regularly use soil testing. Of the firms which use soil testing, 60% have in-house people who write recommendations. Only 30% of the companies polled use testing and write fertilizer recommendations. Apparently most fertilizer recommendations in the area are made without specific soil fertility information. Instead, they are based on the personal or professional experience of those in contact with customers.

42.6% of fertilizer dealer personnel have B.S. degrees or above and 40.4% have High School degrees and professional experience. While we all recognize the value of professional experience, the educational level of those in the local fertilizer industry could certainly be better. Since only 30% of the

companies polled actually use soil testing and write recommendations, industry perceptions of the value of soil analysis may be low, and knowledge needed to use this valuable tool may be lacking. A training program to fill the gap, directed at consultants and fertilizer salespeople would be valuable to the industry.

Dealer perceptions of training needs were weak; 56% indicated some need for additional training. This need for training might be demonstrated with more pointed questions, leading respondents towards specific training options. Better explanation of the potential benefits of more extensive training possibly would result in more dealers perceiving additional training needs.

Both sales and dealer perceptions point to reliance of the industry on nitrogen over other nutrients. As I will demonstrate, the major crops in the area need more than just N, yet 50% of the companies do not regularly use soil testing and thus would have a difficult time assessing specific nutrient requirements. This shows another gap in local fertilizer use and knowledge. The majority of soils in the area are not fertilized using the principles of soil science, or according to actual crop requirements.