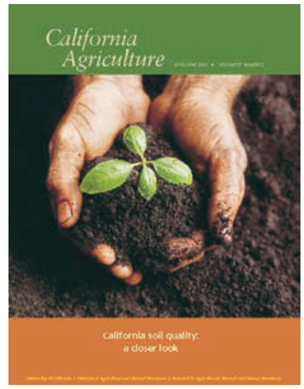
Letters

Skeptical about soil quality



California Agriculture received several letters concerning “Looking back 60 years, California soils maintain overall chemical quality” (April-June 2003, p. 38) by F. DeClerck and M.J. Singer:

I am amazed by the conclusion that the overall chemical quality of California soils is about what it was in 1940, when there was no mention of any minerals other than phosphorus, nitrogen and carbon. Aren’t calcium, gold, iron, manganese, magnesium and so forth chemicals? Or are they simply elements and not to be considered important to the “quality” of the soil?

Clayton L. Olson
Instructor/retired
Santa Cruz City Schools

The apparent increase in clay content in several groups of soils ascribed to soil erosion is inherently implausible and contradictory to changes in other soil properties, particularly total carbon and total nitrogen. A more plausible interpretation of the findings is that the authors obtained more complete dispersal of soil aggregates that were identified as silt or sand in their archival samples.

George Borst, Soil Scientist
USDA Natural Resources Conservation Service (ret.)
Fallbrook, Calif.

Some hunches were borne out in the data: agriculture altered the chemistry of soils, much as expected. The conclusion of the authors once again confirmed transparently the social science aspects of agronomy: “The scientific community, as well as regulators and the general public, have recently raised concerns that uses of soil may be unsustainable . . . We conclude that most of the properties we have measured do not indicate a loss of soil quality in California.”

I struggled to understand this conclusion even in terms of the social values I advocated and I could not. Clay percentage, clay being harder to move than phosphorus, jumped three-fold, detailing huge erosion losses, which in turn modify huge carbon gains.

Bud Hoekstra
San Andreas, Calif.

Economic analysis clarified

California Agriculture received the following clarification from author Louise Jackson concerning “Scientists, growers assess trade-offs in use of tillage, cover crops and compost” (note correct title)(April-June 2003, p. 48–54):

In the economic analysis of Salinas Valley cropping systems that differed in tillage and organic matter management, a spreadsheet error occurred in the calculation of broccoli yields used in table 4 and figure 5. Although broccoli in the conventional tillage plus organic amendment (+OM; such as cover crops and compost) treatment still has the highest harvest costs, total costs, total returns and net returns (see table), the values are not as high as presented originally. The values for the three other treatments also increase because the harvest costs were calculated as a proportion of total harvest costs. However, the relative ranking of the treatments remains the same as originally presented.

Conventional tillage +OM is still the most profitable treatment for broccoli even though it was not the most profitable treatment for the lettuce crops in the experiment, possibly because broccoli

TABLE 4. Revised cover crop + broccoli; crop harvested Apr 2000

Management costs per acre ($)	Min till +OM	Min till –OM	Conv till +OM	Conv till –OM
Harvest costs	3908	3599	5112	3746
Interest on capital	99	72	124	88
Total costs	6605	5866	8250	6466
Returns per acre ($)				
Total returns	7405	6812	9685	7097
Total costs	6605	5866	8250	6466
Net returns	800	946	1436	632

WHAT DO YOU THINK? The editorial staff of *California Agriculture* welcomes your letters, comments and suggestions. Please write to us at calag@ucop.edu or 1111 Franklin St., 6th floor, Oakland, CA 94607. Include your full name and address. Letters may be edited for space and clarity.

The authors respond:

Mr. Olson asks how we can make a statement about the chemical soil quality when we do not investigate all the possible elements that make up soil. Nitrogen, organic matter content, some measure of microbial activity and soil density are measures often used to assess the suitability of soil for agricultural purposes. These properties are indicators of change in the chemical, microbiological and physical properties of soil. Would our conclusions have been different had we measured many other parameters? Perhaps, but those that we measured provide a good look at some of the most important soil constituents that are likely to change the most on agricultural lands over the time period in question.

Mr. Borst suggests that the changes we measured are incompatible and that the clay data are a function of the method used to measure the clay content. All samples were treated the same in the laboratory, and we know of no reason to suggest that the archived samples would behave differently than the new samples in the particle-size analysis.

Soil quality is, as Mr. Hoekstra observes, a qualitative not quantitative parameter. We agree that the concept is qualitative, but as scientists, we try to inform the qualitative with quantitative information. The clay percentage changes may be a function of erosion, deep plowing, land-leveling or natural variability. Among the variables

Research update

Breeding and genetics key to stemming Pierce's disease

"Breeding grapes can be frustrating," Walker says. "Wild species are often hard to classify; they are hybrid forms that can vary between parental extremes. For instance, the same species could have members that are very resistant or very susceptible to Pierce's disease. We can not select parents for breeding without extensive pretesting to ensure they have the high levels of resistance we need."

The process of identifying genes for resistance to Pierce's disease could be shortened by using gene-mapping techniques similar to those used to map the human genome. It may be many years before the grape genome is completely mapped, but Walker and colleagues have begun to build basic maps that will help them find genes that confer resistance, as well as identify better hybrids for breeding purposes.

However, Walker warned: "You can isolate a desirable gene from one grape species and splice it into the chromosome of another, but you currently have little control over where the new gene is placed on a chromosome, or how it is expressed. In many ways, gene-splicing techniques involve as much trial-and-error as traditional breeding techniques."