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Plant Scientists Should Promote Plant Science Through Education

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COMMENTARY

Charles J. Arntzen [(1989). Plant Cell **1,** 1–2] and Robert Rabson [(1989). Plant Cell **1,** 167–168] recently made pleas in THE PLANT CELL for increased funding for plant science research. Unfortunately, these pleas are probably not reaching the appropriate audiences of legislators and taxpayers. If plant scientists want more research funding, then we need to promote plant science more effectively. This is especially important considering current budget limitations and the increasingly poor perception of science because of well-publicized fiascos, such as the space shuttle disaster, scientific fraud cases, Alar on apples, and the dismal state of USA science education, which means that most citizens are largely ignorant of plant science.

How can we promote plant science more effectively? One promising strategy would be to improve plant science education. Plant scientists have generally done a poor job of supporting plant science education. There is no journal dealing with plant science education, yet there are education journals for chemistry, physics, biotechnology, biology, animal physiology, agronomy, horticulture, and agriculture. There is minimal emphasis on education in universities compared to research. Nearly all refereed plant science journals do not accept articles on education, yet textbooks often contain errors and misconceptions about plant science [Storey, R.D. (1989). Am. Biol. Teacher **51,** 271–274]. Mediocre science education is not solely a plant science problem, but it is almost assuredly causing a slow erosion of excellence in plant science research as the quality of education received by future plant science researchers continues to decline.

How can plant scientists improve plant science education? One method is to convince universities to provide appropriate rewards, in terms of tenure and promotion, for excellence in teaching. Starting a plant science education journal would also be desirable since innovative teaching methods could be shared among plant science educators. This could possibly be a joint effort by several plant science societies.

Plant scientists could also try to create greater interest in plant science at all levels of the educational system. This could possibly be accomplished by plant scientists volunteering to speak to public school science classes and clubs and by plant science organizations giving awards to outstanding plant science students at all levels. At the university level, awards could consist of certificates, publication of the recipient's picture or name in the organization's newsletter or journal, or a free journal subscription. Plant scientists could also copy the innovative idea of the food technologists, who give certificates to junior and senior high school students whose science fair projects deal with food science. Plant science organizations like the American Society of Plant Physiologists could also nominate one or more outstanding high school students for the National Science Foundation (NSF) Young Scholars Program [National Science Foundation (1987). NSF83-57, Washington, DC]. Costs of these student recognition programs should be minimal considering the potential benefits—proud parents, motivated students, and favorable publicity for plant science.

Plant scientists might also consider increasing public awareness of plants. Animals seem to get much greater coverage on television and in movies than plants. Perhaps plant scientists could develop some shows and movies on plant science. Maybe a movie with a plotline similar to *Fantastic Voyage* (e.g., "*Plantastic Voyage*") would stimulate greater public interest in plant science. (In *Fantastic Voyage*, people were miniaturized and traveled inside a human body.) Funding for such ventures could possibly be obtained through the NSF Informal Science Education Program. Efforts to educate the public might pay big dividends. The increased number of law school applications is being partly attributed to television shows like *The People's Court* and *L.A. Law*.

Plant scientists also might earn more support by writing articles for popular magazines. Refereed plant science journals have an extremely limited distribution, often 5000 or less. Popular magazines reach much larger audiences. As an example, *Organic Gardening* has a distribution of more than one million.

Plant science organizations should also change their attitude on education to the viewpoint of NSF, which considers that "the term 'research' includes projects to improve the teaching and learning of science" [National Science Foundation (1987). NSF83-57, Washington, DC].

A final strategy is to take the advice of the noted plant scientist Liberty Hyde Bailey [(1919). Proc. Am. Soc. Hort. Sci. **16,** 197–203]:

"The responsibility for the stimulation of research lies with the teachers and investigators. It is not sufficient that we engage in research on our own account, but we must also live the significance of it in public view. As we investigate and as we express the results of our investigation, so will the people measure the value of the research spirit as a motive in life."