1991. As mentioned above, but deserves repeating, findings so far have not indicated the amount and number of pesticide contamination concerns that were feared initially. The chemicals most frequently found have been soluble nitrogen, atrazine, alachlor, and dacthal, principally in high-use areas where soil conditions and possible misuse may have contributed to contamination. Even in those instances where these and other chemicals were found, in almost every case the concentrations were at or significantly lower than levels permitted in drinking water. This is not to say nurseries should not be concerned or not take prudent steps to manage pesticides and fertilizers properly.

EPA is also considering a groundwater strategy to assist itself in addressing pesticide and other chemical contamination problems across the different federal regulatory programs throughout the United States. This groundwater strategy will address such issues as whether the goal of regulation should be zero degradation, and whether groundwater should be classified by intended use. These are issues that Congress wrestled with and ducked over the last few years. Classification of groundwater by intended use is very important when you consider that available regulatory, financial, and manpower resources may not be sufficient to protect all groundwater to drinking-water standards. In other words, should drinking water be protected at the highest level while groundwater under a farm or nursery operation is regulated at a less rigorous standard? This is perhaps an oversimplification, since groundwater recharge and movement depend on geology, precipitation, and other factors.

In addition, EPA is considering regulations to require restricted-use classification on certain pesticides that may or may not have been shown to contaminate groundwater. This will provide criteria for identifying pesticides that may pose an unacceptable hazard and require such pesticides to be managed only by state-certified applicators. The herbicide atrazine was the first pesticide to be classified as restricted-use because of groundwater concerns.

As you can see, EPA under the Bush Administration is taking a comparatively more aggressive water quality role in an effort, in part, to ensure that the increasing regulatory activities by the states reflect national policy priorities. Just as the focus of the 1980s was groundwater, the American Association of Nurserymen believes that we will witness a slow, but steady, change in regulatory emphasis away from groundwater and more toward surface water in the 1990s—if for no other reason than the fact that groundwater represents only 22% of our fresh water, while surface water represents the lion's share of 78%. We are already beginning to detect an ever-so-slight shift in political circles in our nation's capital.

We hope this short presentation helped shed some light on how water quality recently came to the political forefront and on current political thinking and likely future political directions.

Nursery Operator's Perspective on Water Quality Impact

R. Wayne Mezitt¹

The purpose of this paper is to discuss the impact of irrigation runoff and groundwater quality concerns on nurseries and nursery operators. From 1986 to 1990, the Water Management Committee (WMC) of the American Association of Nurserymen (AAN) studied what must be done to assure that the people in the nursery industry can effectively become better managers of their water resources. I will examine our current nursery water management status nationally and locally and review a water management plan of action currently underway. I will then present some of my views about research needs. I hope some of these ideas and perspectives will assist researchers in helping nursery people become truly prudent managers of their most important and primary natural resource.

Although forward-thinking nurseries are clearly aware of the challenges, the majority of nursery operators across the country are relatively unaware that there is a problem with their use of water. Some believe that because they are in an industry whose livelihood depends on an adequate supply of water, they have a right to use whatever water is necessary to enable them to produce their products. Most are doing what they perceive to be the right things with their water use and are confident that future water needs will be met in the same manner as in the past. Many have found it necessary to meet the immediate requirements of regulators, but they consider themselves to be powerless to change many of the ways they are using water and believe that they are already doing a good job of managing it. Many are truly shocked when faced with the realities of complying with new water restrictions and regulations.

The nursery industry is positioned in a uniquely environmentally oriented sector of our economy. We are far more than merely an assembly of profit-making endeavors. We propagate and bring to market the "tools" to naturally clean up and maintain a healthy environment. The trees and plants we produce are the solution to many of

society's environmental (and perhaps social) problems. In many respects, our industry is comprised of people who are actually "practical environmentalists." In the absence of availability of living plants, society would be forced to resort to far less efficient artificial ways to filter water, recycle wastes, clean the air, and render life enjoyable. It is clearly in the best long-term interests of society that the nursery industry continue to thrive.

In this context, I believe our industry faces a critically important two-fold task. First, we must convince nursery operators that there is a problem with their perception of status quo water management and that future restrictions on water use are imminent. Second, we must show nurseries what a good water management program looks like, how each of them can reasonably achieve it, and how to market themselves effectively as prudent water managers.

It seems appropriate to characterize our current water management situation as a national (or even international) challenge requiring local solutions. Even though many policies and actions can be mandated and initiated nationally, it is only through local accomplishments that they can be truly effective. To their credit, our national nursery and landscape associations have begun to identify successfully in the minds of the consumer the value of nursery products to the environment, how living plants are important to a person's health and well-being, and, of course, the aesthetic beauty of trees and shrubs. They are in an appropriate position to begin communicating in a similar manner the value of effective water management within our industry and to the public.

At the local level, the way our nurseries are perceived is the critical issue. Perception varies region by region and nursery by nursery depending on a number of factors, some of which may be beyond the nursery operator's control. An operation in a nonfarming region is certainly regarded differently than a similar one in a community accustomed to farmers and farming activities. Often the visibility of water use or the perception of water waste or conservation is a significant factor. What may be considered normal irrigation practice in Iowa or Texas might appear entirely wrong or inappropriate in Massachusetts, even though the activity may be identical. Attempting to educate the public about "normal" irrigation practices is a difficult long-term process at best and may even prove impossible in communities that have no way to relate to farming. This dichotomy becomes even more pronounced in times of stress, such as during water bans or water quality threats.

The relationship between an individual nursery and its community can also vary considerably, and often merely the attitude expressed by the nursery operator can make a major difference. The manner in which farmers assert their rights must be adapted to their standing in the community. It is one thing to be aggressive in a town that understands and supports the activities of the

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nursery; it is quite another to try the same approach in a region that does not understand or is antagonistic toward activities of the nursery. On the other hand, the nursery operating in a nonfarming community has an opportunity to position itself as unique and valuable, and it can give the area benefits that would be difficult to obtain in the absence of the nursery (such as open land, sites for meetings, inexpensive plants, interesting employment for students, etc.). It is at the local level that we find the greatest opportunity to enhance our industry's image by effectively demonstrating and communicating our prudent use of water.

The plan of action developed by WMC involves both a defensive and a proactive stance. The defensive activity encompasses a determination of our industry's base-line water needs, knowing which water regulations currently affect our nurseries, anticipation of future regulations, and identification of what water management resources are now available to us. Much of this is already underway. The WMC has set up a database to collect information from any member or region that wishes to participate. The AAN has also funded through the Horticultural Research Institute a number of studies on water use and management. Many other agricultural and horticultural groups are also sponsoring water studies and research. Knowing accurately where we are enables us to use our resources wisely and build our efforts from a position of strength.

As water becomes more scarce and as national concerns over the quality of water intensify, a significant increase in the amount of guidance at the national level is essential. This is where our national associations must assert a strongly proactive and aggressive stance that enables local nurseries to demonstrate and communicate effectively how they prudently manage their water resources. The nursery industry must establish a national water-management policy that is acceptable to all nurseries and that provides uniform guidance on standards for prudent water use. Such a policy not only creates a framework for individual nurseries to use in their management of water, but also provides the mechanism for effectively telling our story to the public.

Our AAN WMC is now in the process of drafting "best management practices" for all segments of the nursery industry. Our intent is to document and analyze experiences of nurseries across the country in managing water. We believe this will help avoid duplication of efforts, recognize and step around pitfalls that others have en-

countered, and create bench marks against which we may measure progress. We foresee how presenting specific examples will enable nursery operators to use proven methods that have been effective for others. It also helps to develop a source of new ideas that will make it easy for people to build on successes of others. As an offshoot, we also hope that there will be such a vast amount of attention devoted to water issues that all nursery operators will clearly recognize the importance of water management to their future well-being.

As important as it is to do the right things with our management of water, telling our story effectively to those outside our industry will ultimately ensure that nurseries are perceived as prudent water managers. Nursery operators are by nature generally conservative and often reticent in telling others about their accomplishments, but communicating how and why we are effective managers of water is in many ways the most critical part of our strategy.

Nurseries face major challenges in preserving their right to use water. I believe we are making progress in identifying the problems and educating the members of our industry, but there is far more than we can accomplish by ourselves. The research community occupies a unique position in its ability to assist nursery operators on at least two fronts. First, there is an established network of communication that enables researchers to be very efficient in their use of resources. Second, and perhaps most important, researchers are by their nature very scientific in their approach to solving problems. They are perceived by the observer to be neutral in approaching solutions and their expertise confers credibility on the results. I believe it is by intelligently using the authoritative information provided by the research community that we can most effectively establish nursery operators as prudent water managers.

Research already has provided our industry with a vast amount of information on water management, largely in the areas I have referred to as the defensive part of our strategy. We still need more study, particularly on the specifics of water management for various regions and climates. Much of the recent research has focused on the proactive and innovative aspects of water management. Studies such as those on controlling runoff and practical recycling are invaluable in creating good water-management programs. The leaders in our industry must continue to define our needs to enable researchers to concentrate on the most critical needs of nurseries. We must also commit

to continuing funding to ensure future research.

To confidently assert that nurseries are managing their water resources effectively, we must ensure that nurseries use the information available to them and implement the recommendations from the researchers. This is no small task in a diverse and independent industry such as ours, but unless we are effective in this effort, it will be very difficult to present and support honestly our image as prudent water managers.

One of the major shortcomings of our industry is our apparent inability to communicate effectively vital information among ourselves and to those outside our industry. We must tap into some sort of network that enables us to distribute that information to those who need it. The AAN's WMC database seems to be a reasonable beginning to making information available, but we need guidance on how to set it up and use it most effectively so that the right people can benefit from the information. I am sure some members of the research and extension community can assist us in this effort. We may even discover that much of what we must do has already been accomplished, thereby avoiding waste of valuable resources through duplication of efforts.

Perhaps one of the most productive areas in which researchers can further assist nurseries is in this communication process. Some researchers are equipped to communicate with those outside the nursery industry by using university resources, extension publications, or public relations resources. Most have the ability to convey information within the nursery industry. I believe it is by combining and managing these communication networks that the research community can be of immense assistance in assuring the future of the nursery industry. It is apparent to me that the effectiveness of our communication efforts, especially with those who regulate us, will ultimately determine how successful we are in retaining our water use options.

Our longer-term objective must be to continue this educational process and to include eventually our customers and the public. While this is undoubtedly a worthy goal, our primary efforts must be concentrated on assuring the survival and well-being of the nursery industry itself. Some of the challenges of water supply and quality appear overwhelming, especially compared to the situation only a few years ago, but it is entirely appropriate for us as nursery operators to serve as the true protectors of the environment and providers of trees and shrubs for generations to come.