

NURSERY RUNOFF: A FUTURE CHALLENGE

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While visiting a container nursery recently, I jokingly stated that I was there to check on the presence of potential groundwater pollutants in the runoff water from the nursery. The nurseryman, immediately and without hesitation, informed me that he had no runoff water problems. Well, during the course of the visit, I collected a water sample from a drain that was leaving the nursery and found the water to contain levels of nitrate nitrogen well above EPA standards. Since that time, a more detailed study of nutrient levels in runoff water from container nurseries by this author and others in the eastern United States has revealed that the finding in the above nursery was no exception. Another study has indicated runoff water from nurseries also contains pesticides. The concern over findings such as these is that surface runoff water containing nutrients and pesticides may enter streams and lakes and eventually contaminate the groundwater.

The issue of groundwater pollution raises a flood of questions with few answers. Groundwater is not visible; therefore, it is difficult to evaluate and follow its movement. Contaminated water may be the result of chemical spills years earlier. Thus, certain questions are important: What are the conditions that contribute to groundwater pollution? Which pollutants and at what levels of contamination constitute a threat to human health? Groundwater contamination by substances such as pesticides and fertilizers is a very real problem. It has become a national issue facing federal, state, and local governments.

Scientists in the past believed that groundwater was purified as surface water percolated through the soil. The soil was believed to filter out all man-made impurities. This, of course, is incorrect. A 1985 U.S. Geological Survey study indicated that at least 20 percent of the nation's wells are contaminated with nitrate nitrogen from nitrogen fertilizers (2). Also, 17 different pesticides have been detected in groundwater in 23 states, according to a 1986 EPA study (4). Production agriculture has been labelled as one of the prime contributors to groundwater pollution. In a study by the Iowa Geological Survey, it was demonstrated that recent nitrate nitrogen increases in groundwater in a purely agricultural region parallels an increased use of nitrogen for crop production in that area (1).

The EPA has recently published a strategic plan for coping with the groundwater pollution and has for the most part relegated the responsibility of legislation and enforcement to state and local

governments (5). The EPA, however, will attempt to ensure some degree of uniformity in the laws from state to state. The problem may develop that some states have stiff laws while others pass less stringent legislation. Many states have already enacted legislation that will affect the nurseries as enforcement of the laws is carried out. It is just a matter of time until each state enacts and enforces similar legislation. The state agency responsible for the inspection of nurseries for plant pests might also have the responsibility of monitoring test wells and runoff water from nurseries for the presence of pesticides and mineral nutrients. If contaminants are above federal or state standards, a violation will be recorded with possible fines unless the condition is rectified.

Currently, enforcement is more of a reaction to complaints rather than action toward overall enforcement. Unhappy neighbors could, for example, register a complaint to the state or local water control board that your nursery is contaminating their well water with pesticides or fertilizers. The burden of proof is on you. Determining whether you are or are not becomes your responsibility. If the evidence indicates that you are contributing to pollution, you must take action to correct the problem or be faced with a lawsuit and fines.

The following are suggestions that nurserymen might consider in order to reduce their contribution to surface and groundwater pollution:

1. Apply pesticides strictly in accordance with the label. Who is liable for groundwater contamination when pesticides are applied in accordance with the label is not clear.

2. Apply pesticides only when needed and never above recommended rates. Plant pest laws requiring nurserymen to market only pest-free plants may have to be modified in favor of less pesticide usage. A balance between the retailer's demand for perfect plant specimens with no apparent pest damage and cleaner water may have to be considered.

3. Use proper cultural practices since plants under stress are more likely to be attacked by disease and insects.

4. Irrigate only as needed, based upon different plant species and sizes.

5. Fertilize according to plant demands with the most efficient source of nutrients. In the interest of clean water, we can probably reduce fertilizer application rates with a limited amount of growth reduction. This is possible because as one approaches maximum growth, incremental increases in growth become progressively smaller with each incremental increase in fertilizer applied. A combination of slow-release fertilizers and liquid supplements through the irrigation water for container-grown plants may reduce nutrient runoff but still provide for adequate growth.

Nurserymen who grow plants in containers should design the

surface drainage system in the nursery in such a way that all runoff water is captured before it leaves the property. If it contains pesticides or nutrients at levels above EPA limits, efforts should be made to remove these contaminants before it leaves the property. While runoff water from nurseries in all states is not currently monitored, it may be a matter of time until it will. Monrovia Nursery in California was mandated in 1975 to regulate the level of certain contaminants in the runoff water from the nursery (3). After considerable study, the nursery decided to collect, treat, and recycle all irrigation water. The results have been very encouraging for the nursery from the standpoint of water conservation, reduction in fertilizer usage, and control of pathogens. Although the feasibility of a small nursery's being able to accomplish such a task may seem questionable, a small nursery in Virginia is economically accomplishing the same thing in order to conserve water. Thus, if necessary, it appears that nurseries of any size will be able to control water runoff.

In any case, I would recommend that nurserymen monitor the level of nutrients and pesticides in water as it drains into collection basins or leaves the property. I would also recommend that test wells be dug in order to monitor any contamination of the groundwater under the growing area. With this information in hand, you can take steps to reduce groundwater pollution at your nursery and help to enact state and local legislation based upon facts and not emotion.

Nursery operators take pride in their profession because they are producing plants that beautify the environment and improve the quality of life. Let us also be responsible stewards of the environment and leaders when it comes to preserving the quality of an invisible resource like groundwater:

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