

Green Sense of Balance

By Tim Tice

Every so often a subject crosses the desk that is a pendulum of opinion with strong emphasis of either for or against, and the subject is the usage of pesticides. Lately the advertisers and product peddlers highlight the prominence of organically grown fruit and veggies. Now it may be that my awareness stems from the fact that working with synthetic organic chemicals (pesticides) happen to be a regular theme. Attempting to understand more fully all aspects of pesticides and their uses; those points in dealing specifically with water quality, has lead to researching the subject.

The Oregon State University Extension Services prints a number of brochures outlining key points dealing with environmental subjects. One particular focus is the understanding of pesticides in the environment and assessing their affect on groundwater vulnerability.

Obviously the adage of, "if a little is good then more is better" has been proven a myth when it comes to applying chemicals for whatever purpose is intended. The yield curve of crops actually diminishes too much fertilizer has been applied. The cost of the product outweighs the increased yields of the crop, and the profit curve turns downward. Through science, the application process has evolved and continues to advance. Agriculture is benefiting from such science, yet, does this evolution cross the educational barriers of the public?

Pesticide persistence and mobility through the soils depends on a number of factors, some of which are listed below:

- ◆ Chemical breakdown, how quickly or slowly
- ◆ Microbial degradation
- ◆ Sorption in the soils
- ◆ Erosion, run-off and leaching

The chemical properties of the pesticide, soil matrix, site conditions, water solubility, weather and application method all play a role in how long and where a pesticide may end up.

Persistence:

Persistence in the environment is expressed in terms of half-life. This equals the time it takes for one half of the original quantity to breakdown. Time frames of half-lives vary depending on if the chemical is subject to air, water, soil or a combination of the three. An example of a half-life for an individual herbicide, "glyphosate" is between 30 days and 100 days, which categorize it as "moderately persistent".

Microbial degradation:

This term refers to the breakdown of chemicals by microorganisms. These small bugs consume pesticides as food. These action levels are at their peak when the conditions are warm, moist, with well aerated soils and a neutral pH.

Mobility:

Four factors affecting pesticide mobility may allow the chemical to reposition on the applied site or allow a percentage of the chemical to move off-site.

- ◆ Attachment to soil particles, vegetation and other surfaces
- ◆ Attachment to soils that erode away
- ◆ Dissolving in water and taken up by plants, run-off or leaching
- ◆ Evaporation with wind becoming airborne

Applying a pesticide on a hillside above a lake under stormy conditions will probably not have an effect on the intended area, yet will assist in keeping the mosquito larvae numbers down along the shore.

Many aspects will determine if chemicals in general will show up in drinking water. The understanding on the amount of time a pesticide will remain in the environment is increasing. Knowledge of the activities in your drinking water protection area will enhance the overall consideration to the vulnerability of the groundwater.

Information only for the purpose of information is as important as a book on the shelf that has never been opened. Information for the purpose of sharing, increases awareness and allows for a better decision making process in the future. There is a boat load of information provided to you, the water operator. Review county soil survey maps to know if your water has a more natural protective layer. Talk with county extension offices about where and

what pesticides are being applied in the drinking water protection area. If the surrounding area receives forty inches of rain annually and twenty five percent percolates into an aquifer, how does it equate to the recharge of your water source. Take a few moments to understand those activities; both naturally and man-made within your drinking water protection area that may affect the ground water's level of contamination.

Informed decisions should benefit the majority and create fairness when the solutions are tough to find. We probably won't please all the consumers all the time, but understand a simple aspect to life's story; some people will continually get up on the wrong side of the bed and complain a ton of gold is too heavy to carry. If water operators continue at a level of sustained competence then everything will take care of itself. Managing time, people, money and personal life is a sense of balance that will always be in adjustment. The best that life has to offer!