



ENVIRONMENTAL IMPACT and WATER SAVINGS *Using Irrigation to Deliver Fertilizer*

Overview

In order to provide an analysis and understand the benefits of fertilizing through irrigation, several aspects of the fertilization process must be defined and understood. Results from several accredited Universities, State and Government authorities were used in this evaluation.

Background

The use of fertilizers delivered through irrigation has been used extensively in agriculture, golf course management and nurseries for decades, providing more efficient, vibrant and cost effective crops, foliage and landscape. Designed and patented by a NASA engineer, the R.I.D. System™ was created to convey this effective technology to the residential and light commercial market.

Irrigation Technology

Advancements in irrigation technology have lead to a great reduction in water usage for crop production and foliar maintenance. These include satellite communication, automated management systems, drip systems, recaptured water and equipment enhancements to name a few. The R.I.D. System™ simply provides advancement in the design and implementation of responsible irrigation practices.

Fertilizers: Liquid vs. Dry Broadcast

Dry Broadcast

Once applied, dry fertilizers must have water to disperse down to the root system. The granules must dissolve and depending on the type of water added (natural, irrigation) and may or may not dissolve evenly, thus varying the concentration of nutrients delivered. Burning of plants and foliage can also occur as a result of uneven distribution and release of these nutrients and does not take advantage of a plants' foliar absorption ability. This type of fertilization practice can create a feast or famine feeding schedule for the plant which increases the succulence of the grass, increases its demand for water, makes it more susceptible to heat damage and inhibits its root growth. It also weakens the plant, making it more susceptible to disease and insect infestation.

Most notably, contamination caused from run off of dry fertilizers has caused a great concern in the ecosystem of many costal areas including Texas, Mexico, California and Florida where "dead zones" in the oceans and waterways have been linked to irresponsible fertilizing. Legislation is being passed in many areas to address this concern and limit or eliminate the use of these harmful fertilizing practices.

Organic Liquid:

Studies prove that plants take in liquid fertilizer through foliar absorption (i.e. leaves, stalks, branches) as well as through the root system. The result is a much more efficient and even distribution of nutrients creating healthier plants, lawns and foliage that are less susceptible to weed growth, disease and insect infestation. The Research and Development Subcommittee of the Joint Committee on Atomic Energy conducted a Congressional study and reported that as



much as 95 percent of liquid fertilizers applied may be used by the plant. This ensures the maximum benefit of fertilizer nutrients delivered to the plants chlorophyll allowing more productive photosynthesis with a significant reduction in water used and less wasteful runoff.

Water Savings with the R.I.D. System™

According to research, irrigation water accounts for approximately 50% of water consumed residentially. By using liquid fertilizer to increase the effectiveness of a plants' ability to absorb nutrients, water usage can be reduced approximately 20-50% with a nearly 80% increase in overall efficiency. In addition, millions of gallons of water used to mix, dilute and distribute pest control and fertilizer products via tradition application methods can be saved when delivered via water already earmarked for irrigation. The Department of the Interior released a study that estimates "every major metropolitan area in the western United States has significant potential for conflict over water supply as early as 2025". The R.I.D. System™ is another tool in the advancement of irrigation technology aimed at reducing the strain on our most valuable natural resource by doing more with less. The system and ongoing fertilizing costs are recovered through savings recognized by reduced water consumption.

Energy Reduction and Savings

Fertilization through irrigation presents a number of benefits in terms of energy reduction and cost savings. One key factor is the reduction of chemicals used with conventional dry broadcast fertilizers which use significant energy, specifically in the manufacture of nitrogen found in such fertilizers (approximately 24,600 BTU per pound of nitrogen). Studies also indicate that lawns can be up to 30 degrees cooler than areas without grass (i.e. pavement, bare lawns, etc.). Efficient distribution of liquid fertilizer leads to lush vegetation and foliage, provides more shade and a cooler landscape, resulting in a reduction of energy required to cool a home as well as conserving energy in the delivery and distribution by traditional methods.

Environmental Impact

Organic and natural fertilizers are derived from renewable resources that do not pose a significant concern to the aquatic life or the environment. When used with irrigation the result is less run off and a more effective targeted delivery using less water. Energy savings are realized through the reduction in production and transportation of pesticides and chemicals. No gas powered or electric equipment is used to disperse the products and according to a water resources report from the city of San Diego "plants and turf not only absorb carbon dioxide and release oxygen into the atmosphere but the plant system (leaves, root, and soil) combine to remove toxins from the air."

Social Economic Factors

The introduction of fertilizer delivered through the R.I.D. System not only has positive affects on the environment but creates a beautiful landscape which adds value to your home and community. According to the Nursery and Landscape Association, landscape "adds 7% to 15% value to a residential property."



Summary

As outlined in this analysis and researched by countless Universities, Agriculturists, Government bodies and dedicated professionals, the need for responsible irrigation practices in the residential market is clear. Following the lead of agriculture and over 50 years of using fertilization through irrigation, the R.I.D. System will provide one of the many solutions at the forefront of this movement in new technology development and implementation.