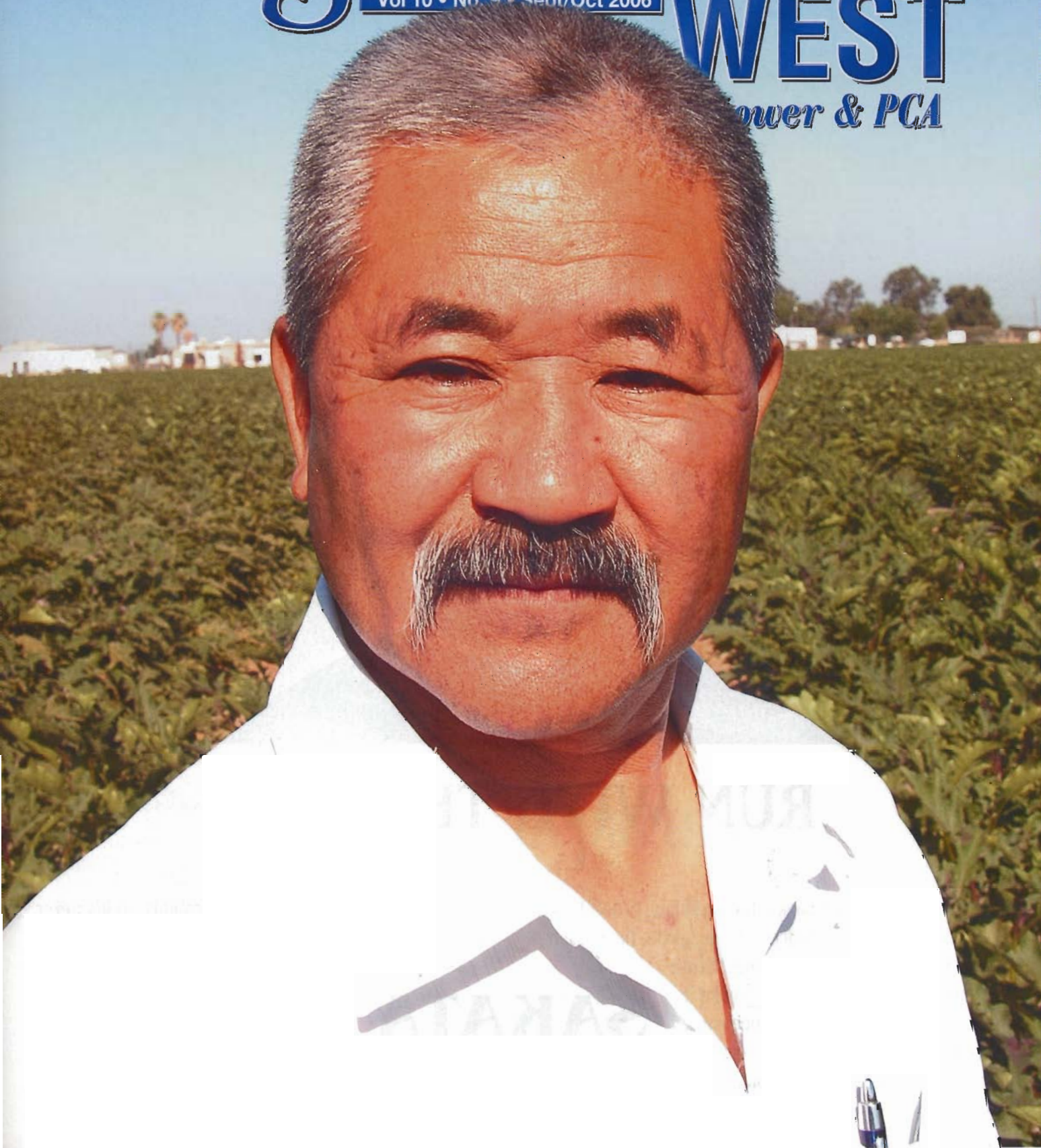


# Vegetables

Vol 10 • No. 9 • Sept/Oct 2006

# WEST

Power & PCA



# SOIL INFO CENTER

WITH PHILLIP BERLIN

## An Optimized System of Soil Inputs Achieves Instant Fertility

Most Agronomists now recognize that beneficial bacteria and beneficial fungi play a vital role in plant health, although the majority of commercial soils have been depleted of these essential components. Over fertilization, soil compaction, intensive cropping without proper crop rotation, as well as overuse of fungicides and pesticides, have all contributed to microbial in-balance in the soil.

New soil inputs, developed after years of experimentation, successfully address this problem. By using this new, optimized system, growers add all the essential microbes and enhance fertility instantly.

Endomycorrhizal (VAM) fungi spores are activated in the soil by the nutrient package and the chemical signals sent out by plants. Mycorrhizae are important to almost every plant. According to Michael Amaranthus, Ph.D., president of Mycorrhizal Applications, Inc., "The

word 'mycorrhizae' literally means 'fungus-roots' and defines the close mutually beneficial relationship between specialized soil fungi (mycorrhizal fungi) and plant roots.

"About 95 percent of the world's land plants form the mycorrhizal relationship in their native habitats. It is estimated that mycorrhizal fungal filaments explore hundreds to thousands more soil volume compared to roots alone." ([www.mycorrhiza.com](http://www.mycorrhiza.com))

By adding Endomycorrhizal (VAM) fungi spores as inoculants, optimized soil input is bringing the benefits of a renewed population of these important beneficial fungi to growers' crops.

The most favorable combination of selected beneficial microbial inoculants plus VAM fungi spores contributes significantly to the reduction in fertilizer and water application. By enhancing the soil with microbes and this soil input nutrient system, root volume

can be 30 to 50 percent larger than in untreated plants. In addition, the VAM fungi increase the effective root area even more by mining and transporting nutrients and water to the plants' root system. Furthermore, mycorrhizae have been shown to attack nematodes, helping to reduce their impact on the plants' root system.

The better the root system works, the better the crop. An efficient root system maximizes inputs and reduces costs. Using the combination of beneficial microbes and VAM will work, but it requires that growers modify their cultural programs. Usually, an optimized system requires growers to cut back on the amount of fertilizer used and reduce irrigation. Ironically, this is an instance where growers **must** do less in order to get better results and increased profits.

### *What Constitutes an Optimized System?*

The combination of starch-based superabsorbent (which holds at least 200 times its weight in water), a proprietary blend of nutrients – yucca and others – endomycorrhizal fungi, and selected beneficial microbial inoculants is the optimal blend of ingredients to achieve instant fertility, maximum yield and overall better crops.

This formula is designed to promote early emergence, reduce seedling disease, build larger and healthier root systems, increase plant population, provide a reservoir of water available to the plant to diminish stress, reduce the amount of fertilizer used to grow the crop, eliminate the need to "over apply"



irrigation water, supply plant growth regulators and plant growth factors, increase yield, and improve quality. All of these benefits are occurring while at the same time soil health is re-established and ground water pollution is diminished.

Starting at planting, an optimized system should be placed as close to the seed as possible, and it will begin to work as soon as the seed or plant is in the ground. If planting into moisture, it will absorb excess water and form a gel, starting the microbial inoculants growing. If planting into marginal moisture, the gel will remain dry until the first irrigation, at which time the starch-based superabsorbent will hydrate.

### **Direct Seeded Crops**

The hydrated gel acts as an incubator for the endomycorrhizal fungi and the beneficial microbial inoculants. At the same time the starch-based superabsorbent gets hydrated, yucca powder, which is part of the proprietary nutrient system, will hydrate and become active. Yucca will promote microbial growth in the gel and surrounding soil, while simultaneously act as a surfactant on the seed coat. This softens the seed coat, allowing moisture to enter the seed and start the germination process.

At this early stage, humic acid, another nutrient component, will also hydrate and become active. Humic acid promotes the growth of microbial populations while stimulating the seed to germinate. Humic substances provide minor elements and important plant growth factors to the germinating seed, powering it to faster germination.

Seaweed powder also hydrates immediately and works much like humic acid, except that it also carries plant growth regulators that promote plant development. At this point in the growth process, seaweed powder gives root growth an extra kick. Like humic acid and yucca powder, seaweed is a big stimulus to microbial population growth.

As soon as the seed starts to germinate, it cracks the seed coat and begins to extend roots into the soil. As the root begins its growth in the soil, it is immediately colonized by the microbes. This allows the microbes to begin to form a mutually beneficial relationship with the plant.

As a root grows, it exudes material from the tip of the root that is designed to lubricate the soil particles, allowing the root to penetrate and grow. At the same time, these exudates are a preferred food for microbes. Microbial growth at the root tip helps expand soil particles and build more lubricants to allow for further penetration of the root into the soil. As the root grows, microbes colonize along its surface, protecting it from harmful soil microbes and mechanical damage.

All of this activity causes the plant to germinate and grow faster. Faster seedling growth is important as it gives the crop a jump on weeds, which can substantially reduce growers' weed control costs. Faster seedling growth usually means less seedling disease, which leads to more ideal plant populations. Faster germination and seedling growth allow for a shorter crop cycle, giving growers a faster-to-market competitive advantage.

### **Success with Transplants**


Usually, transplants were at one time seedlings. Therefore, the ideal transplant program begins with an application of the soil input in the seed flat. After the seed emerges, the

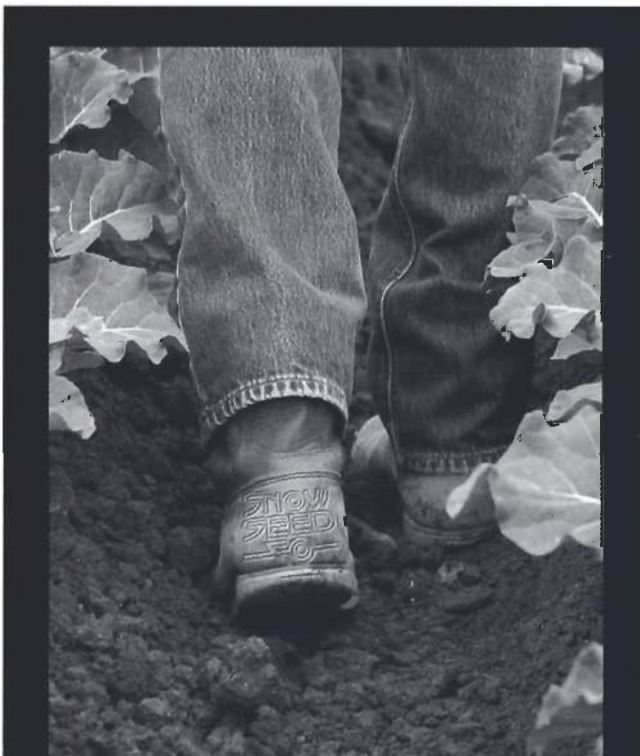
input acts the same, whether or not the crop is transplanted. From this point on, the methods and results are the same as traditional growing procedures.

As the plant continues to grow, the microbes begin to mine the soil for nutrients. Research indicates that plants actually exude materials along their root surfaces that feed the microbes in exchange for minerals, enzymes, plant growth factors, and plant growth regulators produced by the microbes. Beneficial microbes protect the plant by attacking pathogenic microbes, shielding the roots from attack by nematodes, and providing enzyme structures that can be used by the plant to repair injured tissues.

### **Instant Fertility: Mission Possible**

While instant soil fertility may have eluded growers in the past, today it is a reality that can benefit growers worldwide. Focusing upon the initial stages of growth with targeted soil inputs, all stakeholders derive benefits: Growers can shorten crop cycle while increasing quality and harvest yield; farm managers can minimize costs of water and fertilizer – increasing profits without sacrificing yield; consumers can purchase quality produce at affordable prices. The environment also wins because less excess fertilization and over irrigation mean less water pollution and more water availability for other uses.

*Phillip Berlin is CEO, of Super Absorbent Co. The company, with more than 20 years of production experience, is the nation's oldest and leading manufacturer of biodegradable, non-toxic and environmentally safe starch-based superabsorbents.* 



We are with YOU every step of the way.

Corporate Office  
21855 Rosehart Way  
Salinas, CA 93908  
831-758-9869  
www.snowseedco.com  
info@snowseedco.com

