The Vital Earth News

Agricultural Edition

Volume VI, Number 1 Vital Earth Resources • Gladewater, Texas Winter 2000/2001

Biological Transmutations

Do They Occur in Spite of Scientific Skepticism?

by Paul W. Syltie, Ph.D.

Biological transmutations are changes occurring within the nucleus of atoms, so that one element becomes another element. Physicists of today, with few exceptions, claim that transmutations are impossible except in the decay of radioactive elements, or in atomic reactions involving uranium or plutonium. Certain of these reactions release tremendous amounts of energy in a very short time to cause highly destructive atomic explosions.

In order for this explosion to occur there needs to be an activation energy applied to a critical mass of the radioactive element. It is this high energy of activation needed to trigger nuclear explosions that leads conventional physicists to conclude that the transmutation of elements at low, ambient temperatures is impossible ... even if evidence points toward their reality.

Within living cells, however, some very amazing things happen, many which we do not yet understand. There is strong evidence that somehow the cell is able to convert elements from one atomic number to another, through the addition or subtraction usually of hydrogen or oxygen. Interestingly, these are the elements that comprise water: H_2O!

A hen may seem like a rather plain, unsophisticated egg producer, but what goes on inside this really marvelous creature to produce much more calcium than it takes in is an enigma to conventional scientists.

More than any other researcher in history, Dr. C. Louis Kervran of France has contributed immensely to the understanding of biological and nonbiological transmutations amidst a hostile academic environment. He died in 1983 but left a legacy of scientific articles and books on transmutation. Though all were published in French, one has been translated into English entitled *Biological Transmutations* (Happiness Press, 1980), and another has been unofficially translated by Christopher Bird entitled *Proofs in Geology and Physics of Weak Energy Transformations* (Bird, date unknown), of which the author has a copy.

Low energy of activation transmutations occur due to cellular activity, of living systems exerting some sort of influence upon elements to literally change them from one to another. Though deviating from classical physics, Kervran stated,

> "The greatest men of science now recognize that neither the chemistry nor the physics of inert matter are integrally applicable to living matter."

Simple chemistry cannot explain biology, for life has a "spirit" quality to

See Low Energy Nuclear, page 3

The New, Safe Bicarbonate Fungicides

by Paul W. Syltie, Ph.D.

In the world of agriculture today most pest control agents are highly toxic to life. The very toxic chlorinated hydrocarbons, carbamates, organophosphates, and other compounds, by virtue of their toxicity to enzymatic systems, kill bacteria, fungi, nematodes, mites, or insects. Their use has replaced a great deal of labor which farmers in past decades have invested in less lethal forms of pest control, such as the use of copper compounds or crop rotations.

However the hazards of toxicity to the applicators, to the environment, and to consumers of treated crops have surfaced as intolerable risks in many cases. Is there any way out of the current dilemma, of farmers having to apply pesticides to save a crop from sure damage while risking damage to oneself and the land?

A major step forward in the move toward nontoxic pest control has occurred recently in the development and release of bicarbonate fungicides. For years many gardeners have recognized that baking soda, a simple compound found in any kitchen, can control the onslaught of fungal attacks for many crops.

Taking this knowledge to the labora-

$$— HCO_3^{-1}$$

The bicarbonate ion

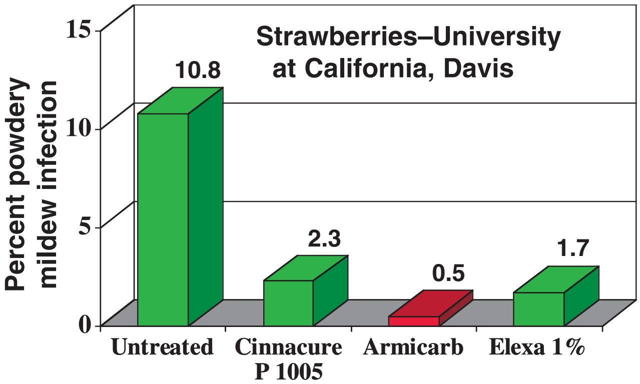
Combined with potassium, sodium, or ammonium this anion forms a potent antagonist to pathogenic fungi of many sorts.

See Non-Toxic Way to Control, page 2

Non-Toxic Way to Control Fungal Disease

Continued from page 1

tory, Ken Horst, a plant pathologist at Cornell University in Ithaca, New York, proved over a number of years that



bicarbonate salts — $KHCO_3$, $NaHCO_3$, and NH_4HCO_3 — combined with the appropriate surfactant, will control a number of serious fungal diseases for agricultural and horticultural crops. He and others showed control for the following organisms on the indicated plants and fruit:

Powder mildew (*Leveilluella taurica)* on tomatoes, roses, grapes, and cucurbits

Powdery mildew *(Sphaerotheca pannosa* var. *rosae)* on roses and strawberries

***Erysiphe polygoni* D.C.** on tomatoes

Gray mold *(Botrytis cinerea)* in vitro (potato dextrose agar)

Alternaria brassicae in vitro

Fusarium graminearum in vitro

Black spot (*Diplocarpon rosae)* on roses

Postharvest decay *(B. cinerea* Pers. and *A. alternata* Fr.*)* on bell peppers in storage

Silver scurf *(Helminthosporium solani)* on potatoes in storage

Green mold *(Penicillium digitatum)* on citrus fruit in storage

Postharvest decay (*A. alternaria, Fusarium* spp., and *R. stolonifer)* on melons

Dr. Horst and others discovered that the surfactant used along with the bicarbonate was important. They have settled on adding a basic, anionic spreader–sticker which synergizes with the bicarbonate. About 2.5 to 5.0 lb/acre of a dry powder is mixed with water and sprayed on the crop for fungal control that surpasses the effectiveness of most currently used fungicides.

The bicarbonate fungicide (85% $KHCO_3$) is marketed in the U.S. by Helena Chemical (where it is called *Armicarb*) and by Cleary Chemical (where it is called *First Step*). Helena markets primarily to agricultural outlets and Cleary to horticultural outlets. The components are so innocuous to people and the environment that few restrictions are necessary for its use.

How They Work

A mixture of 2.5 lb/100 gallons of water is needed for preventative situations, whereas curative situations require 3.5 to 4.0 lb/100 gallons. Effects are due to the following:

1. Buffering a high pH environment and increasing osmotic levels on leaf surfaces creates an environment unfavorable to fungi and fungal spores.
2. Germ tube development of spores is inhibited.
3. An elevated pH environment can disrupt enzymes required to solubilize and expand cell walls and membranes of fungal spores.

Note how a healthy powdery mildew mycelium appears before bicarbonate application.

After bicarbonate treatment the fungal mycelium collapses and dies.

4. Membrane activities and/or cellular physiology are disrupted.
5. Powdery mildew spores collapse within one minute or less after application; the mycelia shrivel and dehydrate.

What is doubly attractive about the bicarbonate fungicides, besides being effective and nontoxic, is that they will not stimulate a resistance developed by various fungal species on repeated applications. There are few, if any, negative aspects of bicarbonate fungicide use, especially when contrasted to typical toxic fungicides. This fungicide is truly part of the up and coming wave of grower-friendly pesticides, safe for a child to use and as effective as Benlate. ❑

References

- *Armicarb 100 technical brochure,* Helena Chemical Company, Memphis, Tennessee.
- *First Step technical brochure,* Cleary Chemical, Dayton, New Jersey.
- Several journal articles authored by R.K. Horst, S.O. Kawamoto, L.L. Porter, Y. Aharoni, E. Fallik, A. Copel, M. Gil, S. Grinberg, J.D. Klein, D. Sorenson, J.L. Smilanick, D.A. Margosan, C. Olivier, C.R. MacNeil, R. Loria, S. Grinberg, O. Ziv, and others. For details on these articles contact Vital Earth Resources.

Pesticide Sprays Aid Disease Organisms

The BBC news service reports on research in *New Scientist* magazine conducted by researchers from the University of Winnipeg. It concludes that harmful bacteria are more likely to grow on produce sprayed with pesticides. Specifically, it charged that chlorothalonil, linuron, permethrin, and chlorphrifos were among the most beneficial hosts for bacteria. The bacteria Salmonella, E. coli and Shigella grew the best in pesticides – up to 1000 times more than on controls.

The research went further to claim that when farmers irrigate their fields they may be spreading large quantities of contaminated water. A spokeswoman for Friends of the Earth in England said, “The research raises further doubt about the safety of intensive farming.”

Low Energy Nuclear Transformations

Continued from page 1

it in the ordering of its cellular activities through nucleic acids (DNA and RNA) and enzymatic activities. Magnetic and electrical powers are invoked amongst the myriads of intercellular activities, which have been proven to be influenced by other cells, electromagnetic waves of all sorts, thoughts of people, and even the phases of the moon and planetary constellations. Why, then, should life not be considered capable of enabling elemental transmutations?

A myriad of studies could be quoted to illustrate transmutations in action. Only a few pertaining to agriculture will be discussed here, and then a number of others will be outlined.

The Chicken and the Egg

Hens generate calcium for their skeletons during embryonic development within the egg, and for the eggs they lay, by transmuting silicon in mica, quartz, and feldspar.

$${}^{28}_{14}\mathrm{Si} + {}^{12}_{6}\mathrm{C} \longrightarrow {}^{40}_{20}\mathrm{Ca}$$

[The upper-case numbers indicate atomic weight (protons + neutrons), and the lower case numbers indicate atomic weight (protons only) in the nucleus.]

The calcium of a developing embryo in an egg does not come from the shell, but at hatching the chicken skeleton contains four times the amount of calcium as in the entire yolk and white. Where does the calcium come from? From organic silica derived from the membrane under the egg shell.

This conversion explains why osteoporosis — the loss of calcium from the bones of older people — can be cured by supplementing the diet with horsetail, or eating fibrous, green vegetables, which are rich in silicon. Cows give much more calcium in their milk than can be accounted for by their intake of grass, yet their bodies are not depleted of calcium. Their bodies convert the silicon from the grass into calcium.

Other calcium transmutations include the following, involving potassium and magnesium:

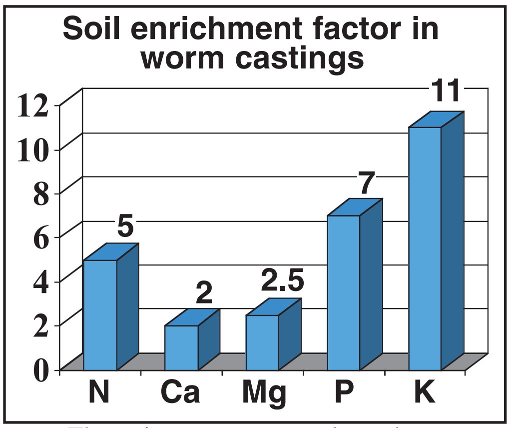
$${}^{39}_{19}\mathrm{K} + {}^{1}_{1}\mathrm{H} \longrightarrow {}^{40}_{20}\mathrm{Ca}$$

$${}^{24}_{12}\mathrm{Mg} + {}^{16}_{8}\mathrm{O} \longrightarrow {}^{40}_{20}\mathrm{Ca}$$

Soil Fertility Concerns

Earthworms are noted for their ability to build soil through aeration and structural improvements. However, they also improve soil fertility substantially by enriching soil elements in their castings by many times: see the figures below.

These worm castings are greatly enriched with available nutrients compared with the surrounding soil. Transmutations are thought by some to play a critical role in this enrichment; see the graph below.



These increases come through transmutations.

Soil magnesium can come from calcium. "It has been observed that when magnesium is missing, lime can replace it, but the opposite does not hold true".

$${}^{40}_{20}\mathrm{Ca} - {}^{16}_{8}\mathrm{O} \longrightarrow {}^{24}_{12}\mathrm{Mg}$$

Soil potassium in both plant and animal systems can be generated by sodium, according to the following reaction. As for all of these transformations, a living, vibrant microbial community within the root zone or the intestines is critical for the success of these reactions, because they occur within microbial cells.

$${}^{23}_{11}\mathrm{Na} + {}^{16}_{8}\mathrm{O} \longrightarrow {}^{39}_{19}\mathrm{K}$$

Potassium can also be generated with nitrogen and magnesium.

$${}^{14}_{7}\mathrm{N} + {}^{25}_{12}\mathrm{Mg} \longrightarrow {}^{39}_{19}\mathrm{K}$$

Daisies, dandelions, and horsetails tend to spring up in calcium-deficient soils. They transmute silicon into calcium so other plants, requiring these elements, can prosper. Nitrogen is produced in the intestinal tract and within soils by the conversion of high carbohydrate materials — which are high in carbon — to nitrogen in the presence of

$${}^{12}_{6}\mathrm{C} + {}^{16}_{8}\mathrm{O} \longrightarrow {}^{28}_{14}\mathrm{N}$$

oxygen.

According to transmutation theory, iron and manganese are interconvertible

$${}^{56}_{26}\mathrm{Fe} - {}^{1}_{1}\mathrm{H} \longrightarrow {}^{55}_{25}\mathrm{Mn}$$

as follows:

This explains why some stones, which contain only 0.05% Mn, may accrue a black surface having 5% Mn due to the conversion of iron to manganese.

It is possible that nitrogen may be converted from the breakup of silicon into two atoms (${}^{28}_{14}\mathrm{Si} \longrightarrow 2\,{}^{14}_{7}\mathrm{N}$). On and on goes the list of possible transmutation reactions in all types of living organisms. It is thought that the massive iron ore deposits of Minnesota were created by microbial transformations, as are so many of the mineral deposits worldwide ... even oil and coal. As Kervran points out, chemical analyses prove the total impossibility that the hydrocarbon components of coal and oil came from wood and vegetable matter.

$${}^{28}_{14}\mathrm{Si} - {}^{16}_{8}\mathrm{O} \longrightarrow {}^{12}_{6}\mathrm{C}$$

They were derived as follows:

The reader is invited to obtain *Biological Transmutations* and study this issue more deeply to verify for himself whether or not transmutations are for real. One thing is for certain: if transmutations occur they are expedited within living cells. Therefore, a vibrantly living environment of soils, plants, animals, and microbes must closely conspire to allow the transmutations to occur which engender the healthiest possible situation. Also, if transmutations occur to a significant degree they must throw into disarray the

See How Little We Really Know, page 6

15-Minute Soils Course

Lesson 12:

Soil Formation

The top six inches of the earth's crust that feeds us is unique in many ways from the soil below ... and from the material from which it originated. These differences are very important, for they help us understand how to manage the soil for greater productivity.

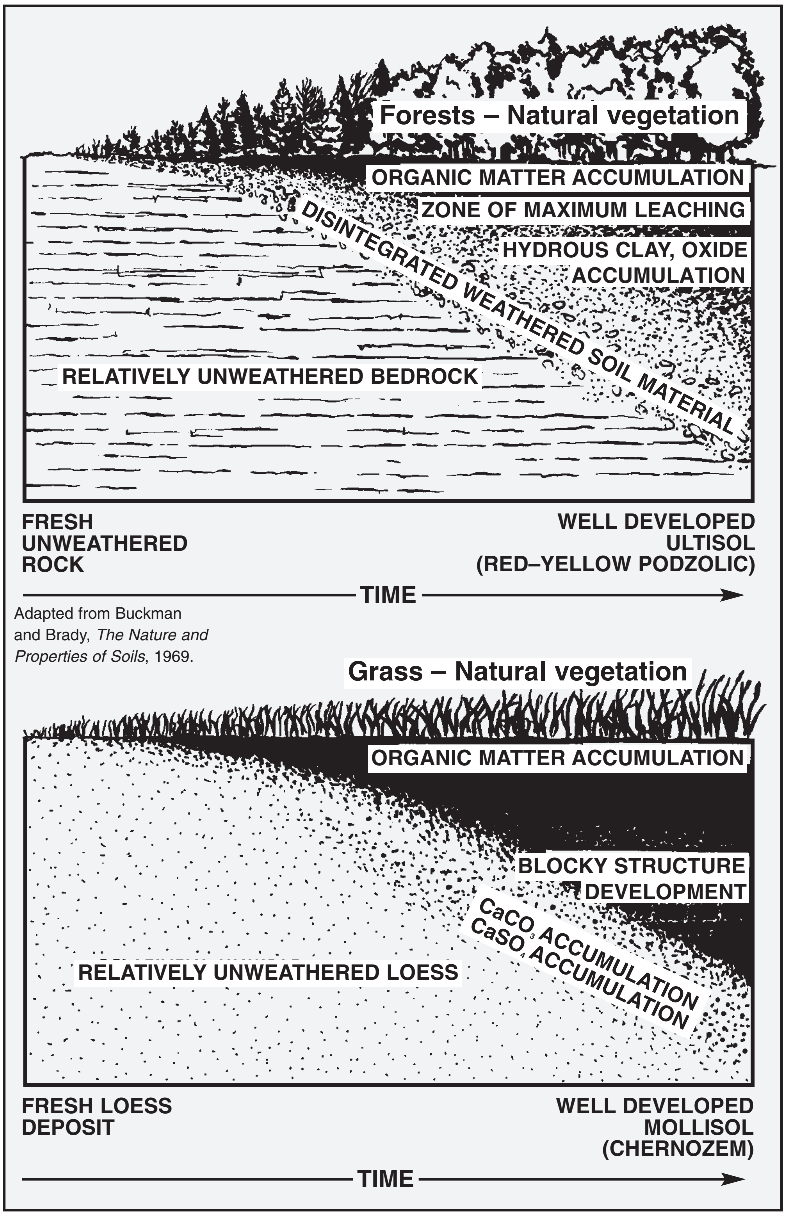
It has been recognized for millennia that various climatic, topographic, and geologic factors are responsible for the soils that develop at a particular location. In the 20th Century a soil scientist named Hans Jenny synthesized the knowledge on soil formation and isolated five major factors which form soils:

1. **Climate:** rainfall (amount, intensity, distribution), temperature, humidity
2. **Parent material**
3. **Vegetation:** forest (coniferous or hardwood), grassland
4. **Topography:** slope position
5. **Time**

In summary, one can envision a soil as being the product of all five factors working in concert: ***Soil = C, PM, V, T over Time***

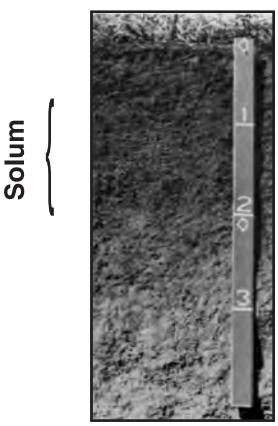
Soils begin developing from a particular base *parent material* which can be rock, gravel, sand, silt, or clay of a particular chemical composition. These may have been decomposed from rocks or deposited by lakes, rivers, glaciers, wind, or volcanic action. Such base materials are acted upon by microorganisms and plants. Microbes consume elements from the rocks and secrete acids that dissolve minerals. Plant roots create intensively active zones of mineral breakdown that accelerate the development of visible *horizons*, especially a zone of organic matter accumulation at the surface ... called the "A-horizon."

Soil structure develops from the top down, bringing water and oxygen into the profile easier over time, allowing roots and microbes to penetrate deeper and create a "B-horizon." The materials – rock or unconsolidated minerals – below the B-horizon are affected last since they are farthest removed from the forces of *climate* (rain and tem-



Adapted from Buckman and Brady, *The Nature and Properties of Soils*, 1969.

The Soil Profile



Surface soil (A-horizon). Zone of greatest organic matter accumulation and root and microbe activity

Subsoil (B-horizon). Zone of less organic matter accumulation, with an upper transition zone and a lower zone of accumulation

Parent material (C-horizon). Zone of limited weathering, with many similarities to deeper strata

Continued on the next page

15-Minute Soils Course

Continued from the previous page

perature) that influence plant and mineral growth.

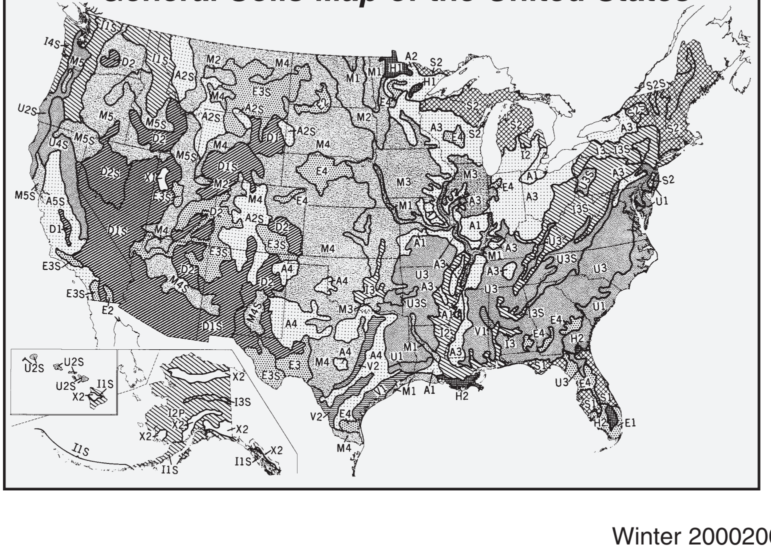
All of these factors work together over *time* to create an enriched topsoil as roots carry minerals above the surface, which then are recycled to the topsoil as leaves die and fall. Roots themselves greatly contribute to organic matter and structure.

Climate governs the vegetation of an area, which in turn controls soil formation. Grasslands form typically organic and mineral-rich, neutral to basic topsoils, whereas forests accumulate less organic matter on the surface, allow more leaching of minerals, and generate soil acidity.

Note in the figure on page four how natural vegetation (a product of climate) and parent material work together over time. Forests have a fairly thin organic layer and intensive zone of leaching ... in this case on weathered bedrock. Grasslands (shown over loess, or wind-blown silt) create highly organic topsoils—up to 6% or more—and a blocky structure.

Weathering becomes more intensive as one moves to tropical areas, so minerals that are broken down easiest by microbes leach out, leaving the resistant aluminum and silicaceous minerals. Cold, temperate zones reduce the rate of organic matter oxidation, so it accumulates, producing soils richer in minerals and organic compounds. Desert areas support little vegetative and microbial growth due to water deficits. Thus, soil development is very limited. Organic soils form in some areas where mosses or grasses in boggy areas limit organic matter oxidation. A generalized soils map of the U.S. is shown here, with ten basic soil groups.

General Soils Map of the United States



A = Alfisols (gray to brown surface, clay accumulation in the subsoil, usually moist, from forests)
D = Aridisols (dryland soils, low organic matter and few horizons)
E = Entisols (desert or alpine soils with no horizons)
H = Histosols (organic soils)
I = Inceptisols (usually moist forest soils with horizons but no subsoil accumulations)
M = Mollisols (black, organic-rich prairie soils)
S = Spodosols (soils with amorphous materials in subsoils)
U = Ultisols (usually moist soils with a horizon of clay accumulation)
V = Vertisols (soils with a high level of swelling clays that crack when dry)
X = areas with little soil

Over time the effects of vegetation and climate tend to override the effects of parent materials, so that a soil built upon very basic limestone may be quite acidic. Soil forming processes are highly complex to form unique soils over the entire earth's surface. By appreciating how they got there we can better manage them for optimum production.

See How Much You Learned

1. The zone of soil formation that contains various "horizons" is called the soil _________.

2. Which of the following is an important soil forming factor? a. Climate b. Vegetation c. Time b. Topographic e. Parent material f. a to e

3. Soil microbes are extremely important in soil development. T or F

4. Grassland soils are more naturally productive than forest soils because they have more ___________ and __________.

6. Tropical soils are poor due to intensive weathering and leaching. T or F

7. Who in modern times developed the concept of soil forming factors?

1. profile; 2. f; 3. T; 4. minerals, organic matter; 5. a; 6. T; 7. Hans Jenny

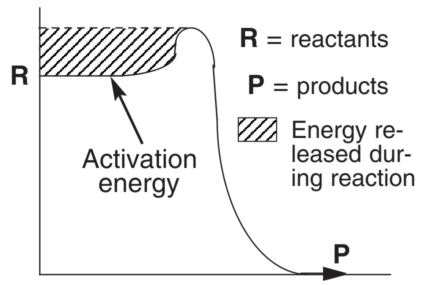
How Little We Really Know!

Continued from page 3

supposed superiority of conventional chemical fertilization and management schemes, and explain the sometimes paradoxical results of organic and natural farmers who produce excellent crops with few or no outside inputs, or who raise 250 bu/acre corn during a drought year when the neighboring conventional field yields 50 bu/acre.

What we know is only a tiny fraction of what there is to know. Let us be both humble and truthful, and be willing to accept the extraordinary when its truth is beyond doubt.

Note the graph below, which shows the "activation energy" for a typical reaction ... the energy required to initiate the reaction of the reactants to produce the products. To produce nuclear reactions in bombs the activation energy is very high, but reactions of biological transmutations need to occur at ambient temperatures.



The means by which changes in nuclear configuration occur are buried within the secrets of God's nature, but surely involve the particle/wave nature of all matter. What we do not know far outweighs what we do know. We can be certain that the realities of the unseen world of the atom are awesome indeed, a fact that ought to humble all of us when pondering the truths of the natural world. ❑

Heavy Metals in Fertilizers?

There is potential for heavy metal contamination in fertilizers. Sources for the primary nutrient phosphorus, as well as the micronutrients zinc, iron, copper, manganese, boron, molybdenum, and chloride, are sometimes by-products from manufacturing, food processing, or other industrial activity. These by-products sometimes contain heavy metals such as chromium, cadmium, lead, nickel, selenium, and mercury. We know that crops take up heavy metals and that they can affect the quality of our food supply as well as the feed supply for animals. It is also believed that excessive heavy metals in starter fertilizers banded close to the seed may be harmful to newly germinated plant tissues.

The U.S. Environmental Protection Agency has taken very little action to regulate heavy metals in waste products used as land-applied fertilizers, and state labeling laws concerning heavy metals in fertilizers are basically non-existent. On the other hand, Canada has been much more aggressive with government regulations and has strict labeling requirements for fertilizers concerning heavy metal content. In this country, the burden of establishing the safety of a product for heavy metal content falls on the consumer. As a consumer, you should ask for information concerning the source of the micronutrients in the fertilizer you buy.

Midwest Laboratories Newsletter, 1995. ❑

USDA REFUSES TO ABANDON TERMINATOR TECHNOLOGY

At its second meeting in July, the 38- member Advisory Board on Agricultural Biotechnology learned that the USDA will continue its contractual agreement with Delta and Pine Land Company on the Terminator technology. This technology, the genetic engineering of plants to produce sterile seeds, has been widely condemned as a dangerous and morally offensive application of agricultural biotechnology and a misuse of public funding.

At the Advisory Board meeting, the USDA revealed that an official public comment period on agricultural biotechnology, from March 30 through July 21, yielded 213 comments: 207 were negative towards biotechnology, and 162 comments called on USDA to ban and abandon its work on Terminator technology. "There is no public support for Terminator, because it's antifarmer and benefits only the corporate seed industry," concludes Hope Shand, Research Director of RAFI.

Despite this public input, the Advisory Board was only given the option of exploring restrictions on the exclusive licensing of its Terminator patents to Delta and Pine Land – restrictions that would have to be agreed upon by Delta and Pine Land.

"USDA obviously favors private gain over the public good and rights of farmers," said Michael Sligh, a member of the Advisory Board and RAFI-USA's Director of Sustainable Agriculture. "USDA has concluded that abandoning the patents and condemning the technology is not an option."

Southern Sustainable Farming. Fall, 2000. (28). ❑

"One of the most important truths we can pass on to our children is the fact that people are more important than things. The best place for learning how to treat people is in the home where there is an opportunity to act out love in the situations of life day by day. Here is where respect for life, others, and self is either formed or destroyed.... In the home we learn to think of ourselves as being part of a family, as being part of something beyond ourselves."

Kenneth Chafin. *Is There a Family in the House?* Word, Inc., Waco, Texas, 1978.

Compost Cleans Up Pesticides in Polluted Soils

Adding compost to contaminated soil dramatically accelerates the degradation of pesticides, according to Michael Cole, professor of soil microbiology at the University of Illinois-Champaign-Urbana.

"Compost adds much-needed microbes to the soil. In turn, the microbes use hydrocarbon-based chemicals as food, converting the chemicals to safe by-products in the process," Cole says. Organic materials such as grass, leaves, manure, and food wastes provide the best raw materials for compost piles. Compost produced from these products are rich in microbes.

Dr. Cole figures that compost treatment of contaminated soil costs about $150 per ton. Off-site landfill disposal costs more than $300 per ton, and off-site incineration costs about $600 per ton. More field tests are planned. ❑

Midwest Laboratories Newsletter, Volume 18, Number 1, 1998.

The most important thing a father can do for his children is to love their mother.

Statement of Purpose

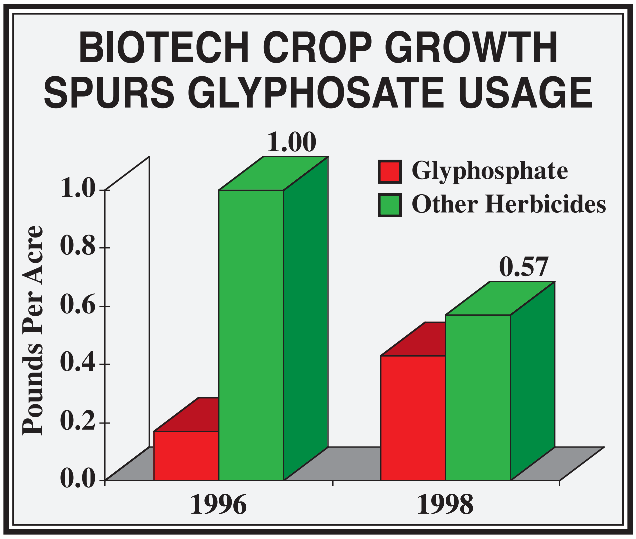
Vital Earth Resources is a for-profit private corporation dedicated to the development, production, and sale of top-quality, ecologically sound horticultural and agricultural products. *The Vital Earth News* is a periodic publication of Vital Earth Resources to inform customers and other interested parties about our products and programs, and to educate our readership on critical issues facing growers today and in the future. If you would like to receive future issues of this newsletter or product information, simply fill out the form on the right and mail it to us.

Roundup Ready Seeds Cause Glyphosate Use to Soar!

With glyphosate [Roundup herbicide]-tolerant seeds gaining much wider acceptance and usage, the use of the accompanying Roundup necessarily increases as well, as the graph here shows. That fact greatly pleases Monsanto, the makers of Roundup Ready seeds and Roundup Herbicide, but what does such a marked increase in the use of this chemical have on the soil and the crop on which it is applied? Moreover, how do glyphosate residues in food affect human and animal health?

Some studies have shown that under many conditions the chemical takes years – not weeks – to degrade into harmless components ... especially in low organic matter soils. In the meantime it may leach into groundwater or run off with surface water or eroded soil. Residues of the herbicide and its breakdown products contaminate food and feed supplies, the health effects of which have hardly been investigated. As more Roundup Ready seeds and Roundup are used, the potential health problems – and cost factors as well – intensify for the farmers and applicators who use them.

Roundup may seem like a boon to weed control for farmers, but add to it the health and environmental hazards and those herbicide effects take on a darker side. Weeds are also beginning to adapt to the toxic effects of glyphosate, similar to how insects have adapted to pesticides. Weeds just take longer to adapt and survive than do insects because their generation time is greater. We may soon have come full circle and discovered that mechanical, flame, or other forms of non-chemical weed control are the best after all in spite of their greater labor requirement. ❑



[Above:Economic Research Service, USDA,

> Success is to be measured not so much by the position one has reached in life as by the obstacles one has overcome while trying to succeed.
>
> Booker T. Washington

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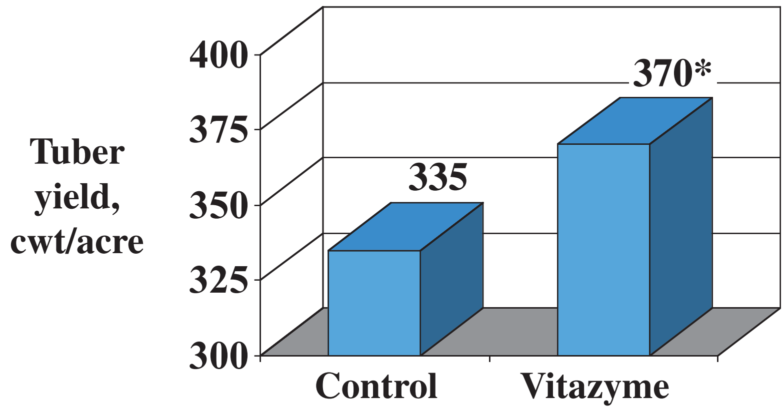

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