NATURE'S WAY RESOURCES
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WHY ORGANIC?

NUTRITION

- Organic milk has higher levels of Vitamin E, antioxidants and Omega 3 essential fatty acids, according to new research released at the Soil Association's annual conference, held in conjunction with the University of Newcastle's Quality Low Impact Food (QLIF) Congress in Newcastle. Organically reared cows, which eat high levels of fresh grass, clover pasture and grass clover silage, produced milk which is on average 50% higher in Vitamin E (alpha tocopherol), 75% higher in beta carotene (which our bodies convert to Vitamin A) and two to three times higher in the antioxidants lutein and zeaxanthine than non-organic milk. The data supports the higher antioxidant levels reported by an Italian Research Council Study. In addition, the research team found higher levels of omega 3 essential fatty acids, confirming earlier research into raised omega 3 levels by the University of Aberdeen and the Institute of Grassland and Environmental Research.

- The Australian Government Analytical Laboratory has found that organically grown vegetables (tomatoes, beans, peppers, and beets) had higher levels of calcium, potassium, magnesium, and zinc than conventional produce. Calcium levels were up to 8 times higher, potassium levels were 10 times higher, magnesium was 7 times higher and zinc levels were 5 times higher. July 1999

- University of Copenhagen has found that organically grown food has higher levels of nutrients than conventionally grown food. Specifically higher levels of vitamins, and secondary metabolites that are thought to lower the risk of heart disease and cancer.

- In Massachusetts the Kushi Institute has measured the drop in nutrients in the soil and in the food grown on that soil using conventional methods. They found that from 1975 to 1997 calcium levels in 12 fresh vegetables declined 27%; iron levels declined 37%, vitamin A levels 21% and vitamin C levels 30%.

- An Acres, USA study (4,000 samples of corn from 10 Midwest states) showed that open pollinated corn contained 75% more protein, 875% more copper, 345% more iron, 205% more manganese. The same trend was observed for calcium, sodium, zinc, and magnesium.

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- A study done by spectrographic testing at the laboratories of Armount's Institute of Research (Chicago) compared hybrid corn and open pollinated corn. The hybrid failed to pick up cobalt

  (the core of vitamin B-12 is cobalt) and many other trace minerals.

- "....70% of all deaths in the United States are caused by diseases linked to the consumption of our diet." The Impact of Nutrition on The Health of Americans, The Bard College Center, Annadale-On-The-Hudson, New York, The Medicine and Nutrition Project, Report No.1, The Ford Foundation, July 1981

- Vitamin C content decreases in crops as the use of synthetic nitrogen fertilizers increase. Soil Scientist, USDA

- Excess synthetic nitrogen (fertilizers) can also reduce carbohydrate synthesis which results in lower glucose content which affects taste. Soil Scientist, USDA

- Four minerals that are considered harmful to humans- aluminum, cadmium, lead and mercury are lower in foods grown organically as compared to those with synthetic chemicals. Doctor's Data Analytical Laboratories.

- The Co-Op Gardening Group Earth Care Newsletter (January, 1994) reports that in a study conducted with Rutgers University, that compared nutritional values between conventionally (commercially) grown vegetables and organically grown vegetables. On average **the conventionally grown (using dangerous synthetic chemicals) vegetables contained 87% LESS minerals and trace elements.**

- Organically grown wheat, corn, potatoes, apples and pears were higher in beneficial minerals and lower in toxic minerals than equal amounts of the same crops grown conventionally (with synthetic chemicals). The organic crops were 63% higher in Calcium, 59% in Iron, 125% in Potassium, 91% higher in phosphorus, 70% boron, 78% chromium, 73% iodine, magnesium 138%, molybdenum 68%, zinc 60%. Aluminum was 40% lower (possible cause in Alzheimer's disease), lead 29% lower, and mercury 25% lower. Analyses were made over 2 years worth of samples. Journal Of Applied Nutrition

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  Ford Foundation, July 1981

- "Pico children" or children that eat soil (10+ g/day) are increasing in numbers across all socio-economic groups, used to be only the poor children that were malnourished. Rufus Chaney, PhD, USDA, BioCcyle, Washington D.C. 1995.

- A new study has found that vegetables grown in organic media contain more nutrition (calcium and vitamin c) than the same species grown in hydroponic media (soilless). HortScience, Vol. 33(2), April 1998.

- The vitamin B_{12} was found to be twice as high in soils fertilized with organic fertilizers as compared to synthetic chemical fertilizers. Both grasses and corn were found to have at least 1.5 times as much vitamin B_{12} in the plant. A. Mozafa, Plant and Soil, vol. 167, p.305-311.

- The USDA in an interview with the Rodale Research Center (Spring 2000) admits nutrient levels in conventionally grown food are dropping and says they do not know why, but it is nothing to worry about and that the USDA is not going to do anything about it.

- In the book "Why Grassfed Is Best", the author Jo Robinson documents why animals that are raised in fields (free range) versus confined factory farms are better for our health:
  - lower levels of disease causing acid resistant E. coli bacteria
  - fewer pollution problems from massive amounts of manure at factory farms
  - over 50% less fat in beef and 20% in chickens
  - over 33% less cholesterol in eggs
  - meat has 2-6 times more heart friendly essential omega-3 fatty acids and eggs 20 times
  - more anti-cancer agents such as the potent fat called conjugated linoleic acid
  - more vitamins (400% vitamin E, 50% more vitamin A, more beta-carotene, etc.)

- The USDA has recently approved exposing food to radioactive materials, a process called irradiation. Exposing food to nuclear radiation makes in unhealthful: it destroys essential nutrients and vitamins, creates a host of new chemicals in the food, some of which like benzene are potent carcinogens. Nuclear irradiation facilities also inherently dangerous to employees and communities. This was done to sterilize food that contains feces, rodent or insect parts, etc. Food & Water Journal, Fall/Winter 1997.

- Producers of organic products are more quality oriented and will use open pollinated grains rather than modern hybrids. For example, the benefits of the grain "Spelt" the ancestor of modern wheat:
  - high in water solubility which makes it easier to digest
  - a simpler type of gluten hence can be eaten by people with gluten intolerance
  - full of fiber, B-vitamins, and carbohydrates
  - contains complex carbohydrates called mucopolysaccharide which boosts blood clotting and the immune system
  - contains 10-25% more protein than modern wheat
  - naturally resistant to insects and disease hence pesticides are not required
  - stores and keeps better than modern grains

- Researchers have found that grass fed livestock is better for our health:
  - contains lower levels of acid resistant *E. coli* bacteria that causes health problems
  - sirloin steak contains less fat (1/2 to 1/3 that of grain fed)
  - chicken contains 20% less fat than conventional confined chickens
  - The USDA found that eggs from free-range chickens contained 1/3 less cholesterol
  - fewer pollution problems from waste disposal
  - meat from grass fed animals contains 2-6 times more essential omega-3 fatty acids
  - free range chicken eggs contain up to 20 times more omega-3 fatty acids than in conventional
  - grass fed animals contains more of the beneficial fat called conjugated linoleic acid which is a powerful anti-cancer agent.
  - meat from grass fed animals contains more nutrients and vitamins (4 times the vitamin-E, 50% more vitamin-A, and more beta carotene)
  - organically grown meat is free-range and grass fed

Kansas State University has found that the Asian vegetable Pac Choi has higher levels of health promoting phenolic compounds when fertilized organically (vermi-compost, compost tea, and fish emulsion), than when synthetic fertilizers is used.

HEALTH (CHILDREN, ADULTS, BEHAVIOR, CANCER, DEGENERATIVE DISEASE)

- The USDA (1993) has stated our bodies are so contaminated with pesticides and other chemicals that if we lived in a cannibalistic society our bodies could not be sold as food under current regulations.

- According to the national health service before 1940 non mortal poisonings were practically non-existent. After the birth of agricultural chemicals there was 1,500 fatal and 60,000 non fatal poisonings in 1952. Before 1952 there was no poison control centers but by 1963 their was 570. By 1962 poisonings had reached 822,000.

- Scientific American put the number of mentally retarded births at 20,000 per year by 1952. In 1965 President Lyndon B. Johnson cited the number as 120,000 per year. By 1968 the statistics of U.S. Pediatricians reported mentally retarded children had increased to 550,000 per year (15% of all births). Since then data is hard to come by but it is estimated that the number has increased to between 1.5 and 2 million per year. Births of mentally retarded children have increased dramatically since the introduction of toxic chemicals on a wide scale.

- The health impact of pesticides is enormous. According to the World Health Organization for the year 1990: 3 million "severe, acute" poisonings: 735,000 chronic defects caused and 220,000 deaths. This, they add, is about half of the actual total, because of the large number of incidents that go unreported.

- The EPA now says that about 70 pesticides now in use are "probable" or "possible" cancer causers.

- Studies now suggest that even low level exposure to pesticides for several years can cause cancer. Example- Women with the higher levels of DDT in their breast tissues are 4 times

more likely to have breast cancer (Mount Sinai School of Medicine in New York).

- The National Academy of Science has said "exposures to pesticides early in life can lead to a greater risk of... cancer, neurodevelopment impairment, and immune dysfunction". This means

our children are in far greater danger.

- Tap water from most public water systems contains chlorine. Chlorine can stunt or kill needed bacteria living in the soil. Chlorine will stunt or kill many plant species. Other effects on plants will cause leaves to turn yellow on some species. Fluorine (Fluoride) is another chemical

frequently added to water systems that has been found extremely dangerous. The EPA has recently re-classified the toxicity of fluorine to be between lead and arsenic in danger and risk. Even very low concentrations (1 part per million) will stunt, weaken the immune system, or kill many plant species.

- The fungicide benomyl marketed under the name Benlate is widely used on vegetables (such as carrots and cucumbers), fruits (such as strawberries) and many ornamentals. It causes tumors, birth defects, and reduced sperm counts in laboratory animals. Regulating Pesticides in Food, National Academy of Science, Government Printing Office, Washington, D.C.

- Studies (4) have shown that many common pesticides used on food crops break down into estrogen as a by product and exposed women have at least a 4 times greater chance of getting breast cancer. Other studies have shown this same exposure will cause male sterility in animals. 10/21/93 ----Health problems like cancer, the ability to have children, etc. continue to increase. Farmers continue to increase their use of pesticides...I wonder how strong this parallel is coincidence or cause and effect?

- A medical school study shows that children in families that use a lot of pesticides are nearly seven times as likely to develop leukemia. .....The EPA estimates that 300,000 hired farm workers and their children suffer acute illness and injuries from exposure to pesticides each year. Farm Workers Still Unprotected, New York Times 2/25/92.

- According to the National Research Council, 6 of the top 7 and 9 of the top 15, foods with oncogenic (cancer causing) risk are produce items with high nitrate content from pesticides or nitrogen fertilizers. A 12 year study comparing organically grown versus chemically grown showed that chemically grown foods had **16 times more nitrate (i.e. oncogenic or cancer**

causing).

- Tumor prevention - synthetic chemicals are only tested as a direct agent not in combination with other chemicals or agents. Many common gardening chemicals are many times more carcinogenic if a person has been exposed to some other agent first such as ultra violet light or a common x-ray. The EPA (much less the chemical companies) does not check for synergistic

effects.

- In 1993, at least 150 million pounds of pesticides whose use is prohibited in the U.S.A. were exported from this country for use elsewhere! These include pesticides that have been banned as well as those which were never allowed on the market in the U.S.A. because of their hazards for human or environmental health. Many of these chemicals come back on and in the fruits and vegetables we import as food.

- Male fertility has decreased dramatically over the last 50 years while abnormalities of the male reproductive system have increased. Researchers believe this is due to endocrine disrupters or environmental hormones of which some are pesticides such as DDT and other organoclorides. A recent study of Danish organic farmers did not have these problems, in fact they had sperm densities about double men that did not eat organically grown food. The study funded by the Danish government's Pesticide Research Program and reported in *Lancet* (June 11, 1994), has found higher sperm counts in members of the Danish Organic Farmers Association than other tested blue-collar workers. The members had a **significantly higher sperm density** that all three reference groups.

- A USDA study (April 94) tested 6,000 produce items (12 kinds of produce) and pesticide residues (49 different pesticides) were found on 61% of the samples. ***All items were***

prepared for human consumption (washed, peeled or cored) before being tested.

- The Environmental Working Group, a non-profit research group, has found peeled apples that contain 8 different pesticides. A dozen different peeled fruits and vegetables were found to contain 13 different carcinogenic pesticides, 17 different pesticides that damage the nervous system, and 11 hormone-disrupting pesticides. Acres, U.S.A., October 94.

- ALL of the dozen or so commonly recommended lawn pesticides are suspected of causing serious long term health problems. Captan and Benomyl are carcinogens and mutagens. Many people have severe allergic reactions to Captan often requiring hospitalization. Dursban has caused chronic kidney damage in laboratory tests and 2,4D has been linked to lymphatic cancer. Many homeowners report problems with common lawn chemicals causing excruciating headaches, nausea, extreme fatigue, and other debilitating illnesses. Garbage Magazine, July/August 1990.

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- A recent research study suggests that children under 14 have four times the normal risk of contracting cancer (soft tissue sarcoma) *if* their gardens have been treated with pesticides or herbicides. North Carolina Center for Health and Environmental Statistics, New Scientist.

- A study reported in the "American Journal of Public Health" has found that children whose yards were treated with herbicides (weed & feed) and insecticides had **four times** the risk of certain cancers. Houston Chronicle, February 27, 1995.

- A report from France published in the New England Journal of Health, has found that average sperm count of Parisian men has decline by 33% during the last 20 years. The vitality or quality of the sperm was also found to have declined. This study confirms the result of other European studies. Houston Chronicle, 2-2-95.

- Studies have shown that nitrate from synthetic chemical fertilizers put babies at risk by causing

  the "blue-baby syndrome". Other studies correlate gastric cancer with nitrate ingestion. Animals are at risk also, high abortion rates and lower milk productivity have been found in dairy herds and are attributed to nitrate concentrations. USEPA, "Groundwater Pollution Prevention Regulations From the State and Local Perspective"

- A study has found that "the persistent, disabling symptoms reported by...multiple chemical sensitivity groups are strikingly similar to those reported among individuals exposed occupationally to pesticides and solvents." Archives of Environmental Health 50(2):119-1298(March/April) 1995).

- One million Americans get sick and 900 die each year from drinking contaminated water. A 1997 EPA study concluded that the federal agency will need to spend over $138 billion on infrastructure over the next 20 years to ensure safe supplies of drinking water. This figure was derived without considering the potential savings from protecting water at its source (i.e. watershed protection rather than expensive water purification plants). Mother Earth News, January 1998.
- Many herbicides are claimed and sold as environmentally safe. For example assorted studies on "Roundup", a popular herbicide containing glyphosate, has found the following:-it is toxic to earthworms, fish, many species of beneficial insects; soybeans and clover planted in fields previously treated, have reduced ability to fix nitrogen; reduces the growth of beneficial soil dwelling mycorrhizal fungi; glyphosate makes bean plants more susceptible to disease; sperm production in rabbits was reduced 50% after exposure; Roundup's active ingredient is the 3rd most commonly reported cause of pesticide illness among agricultural workers; Roundup's active ingredient is the most commonly reported cause of pesticide illness in landscape workers; it has been found in lettuce, carrots and barley, even though it was applied in a previous year.

- A recent study by doctors in Chile, where pesticides are heavily sprayed on fruit orchards, has found a high rate of toxic poisoning and infants born with serious birth defects. This fruit ends up in United States markets. Interpress Service 4/1/97.

- A common childhood malignancy, called Wilm's Tumor, has been linked to the *parents being exposed to pesticides.* American Journal of Epidemiology 141(3)(1995):210-217

- Researchers at the University of Florida and Tulane University have found that endosulfan,

toxaphene, dieldrin and chlordane when tested by themselves had a weak estrogenic response. However, when combine the response increased dramatically. For example when endosulfan and dieldrin were combined the estrogenic potency increased up to 1,600 times over the individual chemicals! Reported in Journal Science, National Wildlife Oct./Nov. 1996.

- EPA and USDA reports show that by the time the average child is **one year old**, the infant will have received the acceptable lifetime dose of eight pesticides from just 20 commonly eaten foods.

- Levels of the pesticide DDT are 35% higher in women with breast cancer (Mount Sinai School of Medicine and New York University)

- The Environmental Working Group (non profit research institute) reports that children may receive 35% of their lifetime dose of carcinogenic pesticides by the age of 5.

- Life threatening bacteria (such as *Shigella, Salmonella, Lusteria,* and *Escherchia coli*) that cause food poisoning, actually thrive on 1/3 of the pesticides tested. New Scientist Journal, No. 2259, 10/07/00, pg. 20.

ENVIRONMENTAL

- Synthetic chemicals do not work: 1) Since the 1940's, crop loss inflicted by insects pests have nearly doubled from 7% to 13% despite a ten-fold increase in insecticide use. 2)

Twenty-five to 50% of the air sprayed pesticide doesn't hit the field and 98% doesn't even target the pest. Most of what is applied enters the environment, contaminating the soil, water, and air, not to mention poisoning or adversely affecting non-target organisms including animals and humans.

- At one time the United States had 1,517 million acres of farm and grazing ground. The Same estimate says 282 million acres became unusable by the end of WWII and that non-ecological farming will ruin another 775 million acres. Acres, USA October 1993.

- "Chemical fertilizers are combined with salts that aid their solubility (in water). These salts,

however, often damage the soil. Because of this plants can only absorb about 20-30% of the fertilizer applied. This means excessive amounts of chemical fertilizers are required to provide plants with the 20-30% they will use. Because excessive amounts are used, chemical fertilizers remain in the soil, resulting in chemical runoff and the pollution of streams, lakes and even wells." Acres USA, June 1993

- A study by Mills McCarthy Associates (an environmental firm) found that over a seven-year average lifetime, gas powered mowers spew 28 pounds of hydrocarbons and nitric oxides (contributors of smog), 300 pounds of carbon monoxide, and 1,400 pounds of carbon dioxide. Use a push mower or use less grass area (less mowing) to help reduce pollution.

- Earthworms and other beneficial organisms are destroyed by synthetic chemical fertilizers and fungicides, pesticides, etc. (Reviews of Environmental Contamination and Toxicology, 1992). In the absence of earthworms, the soil becomes lifeless, sterile, and nutrient deficient or even worse an incubator for pathogens and disease.

- We have been forced to pass laws prohibiting fishing of our rivers and lakes due to excessive nitrates, and yet the local lawn & garden guru is on the radio or TV telling us it is time to apply our synthetic fertilizer and pre-emergent herbicide.

- When using synthetic fertilizers at least 35% of the chemical nitrogen, 15-20% of the phosphorus and potassium applied to land is lost because they are applied in amounts greater than can be immediately assimilated by plants or soil. Composting, Rodale Press, 1992

- A recent study of nurseries in 6 states found that 81% of the Nitrogen applied in irrigation water was not used by the plants. It also found that up to 29% of the Nitrogen released from Osmocote was leached out of potting soils within just 11 weeks. "Container Nursery Nitrogen Runoff: A Six State Summary", International Plant Propagators Society, 1992.

- Many beautiful and beneficial insects are being destroyed. Pesticides targeting other harmful (undesired) insects, like mosquitoes or the Gypsy moth, also have been responsible for reduced butterfly numbers. Texas Parks and Wildlife Department, Nongame and Urban Program.

- **We do not and can not test for all the combinations of toxic synthetic chemicals and how they affect the environment.** Example: The herbicide Dicamba is characterized as "slightly toxic" or "practically nontoxic" to fish. It has been found that this is widely variable. If Dicamba is absorbed by vermiculite (a common ingredient in potting soils) its toxicity increased by 30 times. No effects were observed on yearling coho salmon at 100 ppm. However, it has now been found that doses as small as 0.25 ppm can kill coho salmon as they migrate from seawater to fresh water for spawning.

- "Dead Zone Spreading" - A lifeless area devoid of oxygen covering more than 7,000 square miles (the size of New Jersey) developed in the Gulf of Mexico in the summer of 1995, the largest ever. Scientists at Cornell University conclude that the dead zone is the end result of an ecological chain reaction set in motion by fertilizers, sewage, and runoff ending up in the Mississippi river. The excess chemicals in the run-off stimulate the rapid growth of algae and phytoplankton. When these die they decompose depleting the water of oxygen. As a result, shellfish, shrimp, and fish that cannot escape soon suffocate and die. The implications of the dead zone exceed those caused by the ozone hole in the atmosphere. The New Garden Journal, January/February1996.

- A study published by the American Chemical Society, concerning the death of hundreds of moose in southwest Sweden said that acid rain is changing the micronutrient composition of plants that moose graze. In addition moose graze fields that have been limed by farmers further messing up their nutrition. New York Times, 12 March 1996.

- A series of investigative reports (copyrighted) by the Seattle Times Newspaper has found that many companies that manufacture synthetic fertilizer add hazardous waste and radioactive waste to their fertilizers. These extremely dangerous wastes then end up in our food supply or in our yards for our children to play in. July-August 1997, Seattle Times Newspaper.

- Scientists have warned us about the dangers of synthetic chemicals. Dr. Jerome Wiesner has stated that using agricultural chemicals is more dangerous than atomic fallout from a nuclear war. Rachel Carson warned us of many dangers in her famous book "Silent Spring".

- An article in *American Nurseryman* reported that pesticide usage reached an all time high in 1995. According to the Natural Resources Defense Council and the U.S. Public Interest

  Research Group chemical usage was **1.25 Billion pounds** of pesticides, insecticides, and fungicides.

- Between 1982-1987 there was over 230,000 *imported pest insects* found by the USDA that have entered the United States hence record keeping was discontinued. However, the natural biological controls that kept these pests in check have not entered or have not been allowed to enter the United States by the USDA. Mike Rose, PhD, Texas A&M University Bio-Control Laboratory.

- Insects such as aphids decide which plants to munch on by the odors they produce. USDA Scientist, Greenhouse Manager, June 1994. It is well known that plants over stimulated by synthetic fertilizers produce more odors (i.e. attract more pests).

- Traditionalists (synthetic chemicals supporters) fight nature (paddle upstream) while the organic philosophy works with nature.

- "Here in America, agricultural chemicals are the single biggest cause of surface water pollution. Most of the nations **underground** water supplies are also contaminated by insecticides, herbicides, and chemical fertilizers. And, unfortunately, the filtration systems that treat public drinking water can't get all the chemicals out. In Ohio and Iowa 82% of treated public drinking water contained residues of two or more pesticides."

- A report in the scientific journal BioScience says that a mere 1% of the chemical insecticides applied to plants ever reaches its ultimate destination...the plant insects. The other 99% pollute and poison the air, soil, water table, good insects, animals and man.

- Many synthetic fertilizers now contain hazardous waste like lead, cadmium, mercury and arsenic. When these toxic fertilizers are applied to crops they are absorbed into the plant and when we eat the food produced they enter our bodies. Studies have shown that 80% of the potatoes used in French fries contain dangerous metals and is one of the causes of ADD of our children,

ECONOMICS AND COSTS (HIDDEN AND REAL)

- The Agriculture Research Center of Finland and Biodynamic Research Center of Switzerland recently published the results of a 32 year study comparing conventionally grown food (using dangerous synthetic chemicals) to an organic approach. American Journal of Alternative Agriculture, Volume 12, Number 2, 1997.
  They found the following results:
  - yields in the organic or biodynamic approach increased 65% compared to only 50% for the synthetic chemicals
  - protein quality was higher in wheat and potatoes (the conventional had higher total amino acid

    and protein content but was not suitable for animals or man)
  - for potatoes the storage quality and resistance against deterioration was higher in the organic treatments
  - the starch quality was higher for wheat in the organic approach

- The United States subsidizes its chemical based agriculture by nearly $23 Billion each year to keep it functioning and hide the true costs.

- "Plants grown with ammonia- based synthetic fertilizers actually attract pest insects." Earth Kind Gardening, 1993

- Pesticides do not work well anymore. Over 500 insects and other pests have developed resistance to pesticides (Earth Kind Gardening, 1993). By another count 900 species of

insects are now resistant to commonly applied pesticides (Country Life, May/June 1994).

- Synthetic nitrogen (fertilizers) has been found to reduce insect and disease resistance of plants. Soil Scientist, USDA and Ohio State University 2003.

- Studies in England, over a 34 year time period, have found that cows grazed on organically grown field produced significantly more milk, used 10-15% less supplemental feed, and had a better breeding record.

- The 1993 National Corn growing championship was recently won by a "Organic Farmer", Gary

Cross of Logan County, Illinois, beating out synthetic chemical based farmers (598 finalists) from 7 different states. He produced 249.5 bushels/acre nearly twice the nationwide average. Organic Gardening, July/August 1994, and Associated Press.

- If synthetic chemical insecticides and sprays are used to kill off all insects...you have created a problem. Pest insects reproduce faster than beneficial insects, hence pests will return with no natural controls to stop the damage. This means more chemicals are required and the circle continues with the only beneficiaries being the vendor and manufacturer of these chemicals.

- Plants grown organically have much greater resistance to freeze damage than plants fertilized with synthetic chemicals. Examples range from grape growers in Missouri in 1989-90 season with -21EF temperatures where 80% loss was common for grapes grown with synthetic chemicals while organic growers had normal and full yields. The same arctic front killed the Mango and Passion fruit plants in Southern Florida except for the organic grown plants which survived without problems. Acres, USA, May 1994

- Steve Rioch, administrator of Ohio University's farm reports that yield increased *seven-fold* just 5 years after converting this former piece of farmland to organic raised bed techniques. Organic Gardening, February, 1994.

- In 1991 Texas had 500 acres of organically grown cotton, in 1993 there was 15,000 acres of organic cotton. Organically grown cotton is far superior in quality to conventionally grown

hence commanding a premium price in the market. Preliminary reports indicate that there was over 42,000 acres of organically grown cotton in 1994.

- The International Rice Research Institute (IRRI) recently announced that farmers worldwide spend $2.4 billion to protect rice, more than any other crop. IRRI says that it is a poor investment as the cost of spraying far exceeds the benefits. IRRI has found that natural pest control consistently has the highest net benefits for farmers. Science News.

- Organic Techniques are cheaper: if you compare a bag of synthetic chemical fertilizer to an organic fertilizer the synthetic appears cheaper
  - synthetic will loose 40-60% of nutrition to runoff

  - synthetic will add salts that poison the soil and disrupt pH
  - synthetic have to be applied 4-5 times per year (vs. 2 times that will eventually go to one time, extra labor)
  - synthetic encourages forced growth of plants that attract insects and diseases which require increased costs for additional synthetic chemicals and labor, increased risks
  - organics require less water (often 50%) less,
  - organics produce more flower and fruits
  - organics promote healthier plants...less loss to insects disease, or hot or cold extremes of climate

  ALL the result of healthier soil.

- A recent study with wheat has found that the highest yields were from soils containing the highest organic matter content. Soil Science Society of America, Vol. 58, Jan.-Feb. 1994.

- Iowa State University has released the results of a 11 year study that showed Iowa farmers have been **wasting $200 million per year** on N, P, and K fertilizers that they did not need.

- The USDA's Agricultural research center in Beltsville, Md. reports that tomatoes grown organically are producing yields equal or better than those grown with chemicals. The report also says that these tomatoes are producing ***profits*** of $7,365 per acre compared to conventionally grown (plastic mulch and chemicals) of $4,128 per acre. Organic Gardening, Dec. 1994

- The USDA's Agricultural research center in Beltsville, Md. reports that using vetch and winter wheat to suppress weeds is working as well as herbicides (which cost more and does not improve the soil). Organic Gardening, Dec. 1994

- Use of synthetic fertilizers encourages growth of "scale" populations. Scale populations increase rapidly when quick release forms of synthetic chemical nitrogen are used. This does not occur if slow release organic forms are used.

- In 1980 the USDA reported in "Returns To Corn Pest Management Practices" found that herbicide use was not economical. For every $1.00 spent on herbicides the farmer will receive a return of $1.05. Environmental damage, soil damage, health risks, etc. was not included in

  this report.

- Each year, American farms dump more than 40 billion (40,000,000,000!) lbs. of fertilizer on farm fields and 500 million (500,000,000!) pounds of pesticides. Much of which ends up in the food we eat, the air we breathe, and the water we drink. The federal government spends more than $2 billion each year in its loosing effort to control pesticide pollution and agricultural runoff. The federal government pays farmers (through grants, incentives, and tax breaks) to apply these dangerous chemicals then pays to try and clean them up, all with taxpayer (your) money. This type of activity makes the military and its wasteful activities look frugal by comparison.

- In 1996 cotton growers in the Rio Grand valley have voted kill the "boll weevil eradication program" (i.e. blanket large areas of the country with pesticides (malathion) to control boll weevils) and growers in other states are requesting referendums for the same. The result of the spraying in the Rio Grand Valley was a decrease in yields from 307,943 bales without spraying to just 54,101 with spraying. Farmers across the south had similar experiences. For example, one farmer Mississippi in their eradication zone on 700 acres averaged 280 lbs/acre and spent $128/acre on pesticides on his 700 acres outside the zone he averaged 510 lbs/acre of cotton and only spent $81/acre for insect control. Texas Organic News, Summer 1996.

- Studies have shown that each inch of soil loss due to erosion in the U.S. corn belt reduces crops by 6%. United National Environmental Programme reported at 1994 National Poultry Waste Management Symposium

- Three billion tons of topsoil is lost on American farms each year--also the direct result of the use of agricultural chemicals." Organic Gardening, December 1992

- Studies conducted in England since the 1940's and known as the Haughley Experiments have shown that hens given organically grown grain: began laying at an earlier age (166 days vs. 181 days); the hens produced more eggs over 9 months (192 per hen vs. 150 per hen); and the eggs had a better keeping quality (27% spoilage vs. 60% spoilage after 6 months at room temperature).

- South Texas cotton farmers will incur losses of over $210 million in 1995 because their over spraying of pesticides has killed off the beneficial insects. Houston Chronicle 9/28/95.

- **Organics or Environmentalism creates jobs**, the conclusion of 2 new studies by the National Commission for Employment Policy an Independent Federal Agency. Between 1994 and 1998 the environmental industry will generate 184,000 jobs directly with indirect job creation creating even more, for a 3.9% annual job creation growth rate, more than double the economy average. Environmental jobs now employee more than 1 million people. American Nurseryman, June 15, 1995
- An organic rice farm obtains 85% the yields of its chemical neighbors, has a lot lower production costs (over $100/acre), and gets 200% or more of the price of its conventional

  neighbors. "A Farming Revolution", National Geographic, December 1995,.

- Research at the USDA in Beltsville, Maryland [HortScience 32(4):659-663 1997] have done studies comparing hairy vetch (Vicia villosa, a winter hardy legume) and plastic. The vetch plots had a longer season and produced up to *twice* as many tomatoes. Vetch is less expensive, more environmentally friendly, and enriches the soil by adding organic matter and nitrogen. Other crops that had a strong positive response to vetch mulch were melons, snap beans, peppers, and eggplants. These studies suggest that other mechanisms were responsible other than nutrients: 1) improvement of soil physical properties by an organic

mulch, 2) reduction of foliar diseases that can affect nutrient uptake, 3) a lower proportion of reflected far-red radiation that can influence the development of vegetative and reproductive growth.

- Researchers have found that natural organic fertilizers can supply all the nutrients that hybrid bermuda grasses need (like the kind used on Golf greens) [HortTechnology July-September 1997]. This is without all the dangerous environmental side effects of synthetic chemical fertilizers.

- According to an analysis by the Environmental Working Group (EWG), between 1996 and 1998, the USDA subsidized conventional polluting agriculture for $23 BILLION worth of taxpayers dollars! Over 61% went to the largest 10% of corporate factory farms.

- The United States suffers a topsoil loss every year worth an annual value of $27 Billion! Harold Willis, PhD, Acres, USA, 3/97.

- A recent conference/study (November 2000) in Canada on pollution and environmental issues found the following:
  - 1 in 8 Canadians suffer significant symptoms (increased absenteeism, measurable impaired abilities to do work, etc.) due to normally safe/legal exposures to common chemicals found in homes and at work
  - the cost was over $10 billion a year in lost productivity
  - over $ 1 Billion eroded from the tax base
  - over $ 1 Billion each year in additional health care costs
  - over $ 1 Billion each year in avoidable disability payments, etc.

- In the year 2001, the USDA will hand out $30 billion dollars in taxpayers money to support conventional (uses dangerous chemicals) agriculture but less than $10 million to support organic agriculture. Of the 30 billion, $17 billion goes to corporate farms as handouts, not to the small farmer whom needs it most. Acres, USA February 2001

- Organic food sales have soared from $174 million in 1980 to $1.25 billion in 1991 to over $15 billion in 1998.

DANGEROUS CHEMICALS DO NOT WORK

- Insecticide and pesticide use has increased tenfold in the last forty years, however the loss due to insects nearly doubled in that same time! Synthetic chemicals are not the answer and will not work successfully in the long term.

- Natural biological controls work. In California, after repeated failures with chemical controls, a grant was issued to the Bio-Control Laboratory for $500,000 to develop natural controls for a species of imported white fly. Within a short period of time natural controls were identified, brought to the United States, propagated and released into the problem area. The pest was quickly controlled. It was estimated that it saved growers in just 1 county over $19 million in pesticides. Mike Rose, PhD, Texas A&M University Bio-Control Laboratory.

- Mycorrhizae fungi live in a symbiotic relationship with plant roots. Some plants can not survive without these root-fungus associations. Benefits include increased water and nutrient absorption, reduces transplant shock, and controls certain root diseases. Growlines, Sept./Oct. 1995.

  Note: Unfortunately most plant propagation programs (rooting mixes, fumigated (sterile) soils, synthetic chemical fertilizers, and treated water (chlorine and fluorine) discourage their development. And you thought you didn't have a green thumb.

- Researchers have found that tomato plants grown with a living mulch without chemicals (plants- hairy vetch and crimson clover, and rye) yielded more than those from other treatments such as black plastic. These techniques worked well in hot humid summer climates. HortScience, Vol.

  31(1), February 1996.

- A Danish study has shown that herbicide resistant rape in two generations has passed on its resistance to its weedy brassica cousin. About 42% of the second generation brassica weed seedlings had inherited the resistant gene. New York Times, 7 March 1996.

- The University of California at Berkeley has found that broccoli and other vegetables

fertilized with organic fertilizers attracted less pests than those with chemical fertilizers. Additionally, the organic fertilized plots out yielded the commercial plots!

- After decades of spraying with expensive dangerous chemicals the cassava mealybug remained a major pest in Africa. This pest had threatened total destruction of the cassava plant, one of Africa's major food crops. In 1995 the World Food Prize was given to Dr. Hans R. Herran an entomologist who learned how to bread and distribute a tiny wasp that was the natural predator of the mealy bug. Within 5 months of the wasps release, they had spread 120 miles from the release point and reduced mealybug populations below damaging levels. At the end of seven years mealy bug damage was eliminated in 30 African countries! Alternative Agriculture News, November 1995.

- For years we have read about the damage the imported "Gypsy Moth" was causing to forests in the Northeast and mid-continent. Massive chemical spray programs were used for over 20

  years with defoliation damage increasing to nearly 1.4 million acres of forest in 1995. Then a natural fungus (biological control) was released in many states with damage rapidly dropping to only a total of 200,000 acres in 1996 with some state not recording any damage. American Nurseryman, May 1, 1997.

- Researchers at Ohio State University have repeatedly shown that the European Corn Borer moths lay 18 times more eggs on sweet corn plants grown in chemically farmed soils that corn grown on organically managed soils. Plants growing in organic soils can absorb exactly the minerals they need for photosynthesis and more quickly convert simple sugars and amino acids into complex starches and proteins needed to grow leaves flowers and seeds. Soils managed with synthetic chemicals lacked this needed balance. Journal of Environmental Entomology, vol. 25, 1996.

- Experiments with Gleditsia tricanthos inermis ("Honey Locust") have found that the destructive necteria cankers are greatly increased when grown on bare ground or where herbicides had been applied. Avant Gardener, 8/97.

- In the last 10 years, the number of weed species known to have become resistant to herbicides has increased from 64 to 270 species and the number of plant diseases resistant

to fungicides has gone up 50%. Pest Management at The Crossroads, The American Gardener, March/April 1997.

- Independent researchers say it (Benlate) must somehow turn poisonous...through a complex series of reactions...that involve the breakdown products of benomyl or inert ingredients used... Farmers Worried as Chemical turns Foe, New York Times 1/24/93.

- The USDA-ARS research laboratory in Georgia has found that when pecan trees are given "optimal" amounts of nitrogen fertilizer and irrigation according to conventional wisdom, they actually had more foliar damage from pecan aphid and mites (and subsequent reduction of yields) compared to trees that received minimal cultural inputs!

- In the past 50 years, more than 500 insect pests, 230 crop diseases , and 220 weed species have become resistant to pesticides and other chemicals. Organic Gardening Sept./Oct. 2000

POLITICS, REGULATIONS AND EDUCATION

- **Why does the public not hear more about the dangers of synthetic chemicals?** "The suppliers of agricultural chemicals have a $35 billion to $50 billion a year business to protect." Organic Gardening, December 1992.

- The entire concept of natural or organic gardening philosophy would signal the beginning of the end of the highly profitable synthetic chemical industry. An industry that is deeply entrenched in established economics.

- "The question of research (grants) is more clear, in spite of a rather impressive list of clinical studies published on organics...organics does not get studied. While chemicals are studied by
  the thousands, both by government and the chemical industry whom wishes to sale the chemicals. It also means, thanks to the stonewalling role of media (another corporate establishment) that you (or your garden center horticulturalist) don't even know that such orthodox studies are conducted and reported on".

- "After years of study and lots of money all I learned was to keep disease at an acceptable

level". PhD Horticulturalist, Soil Scientist, USDA

- Its cheaper to farm organically than with synthetic chemicals. Organic farmers do not put pesticides, fungicides, herbicides, and other extremely toxic chemicals into our air and water (rivers, lakes, and aquifers). Organic farmers do not destroy topsoil or other living creatures. They do not use toxins. Yet, Organic farmers are punished when they go to the market place because they have to compete with producers who don't take care of their land or water or crops. So they have a price disadvantage. Also, organic farmers must prove that did not pollute or chemically contaminate their produce. Farmers using synthetic cancer causing chemicals can sell what ever contaminated food they want to the public. If farmers who are destroying the soils, polluting the air and water, and destroying our health would take full responsibility for their actions, then foods grown with synthetic chemicals would cost dozens if not hundreds of times more.

- The entire concept of natural or organic gardening philosophy would signal the beginning of the

  end of the highly profitable synthetic chemical industry. An industry that is deeply entrenched in established economics.

- Most people in the green industry are hardworking honest people with the best of intentions for the customer...however, the chemical industry has taught us to treat the symptoms rather than the problems (this practice ensures lots of repeat business - since problems keep reoccurring).