

The Collision of Technology & Know-How Need



by John Pade

When I was born in 1949, the population of the world was approximately 1/3 of what it will be just a few years from now. Agriculture was a way of life for me since I was born on a Dairy farm in the heart of the Midwest. When I was young I always wished I could have a nickel for every time my Dad or Grandpa said "If we could only control the weather." The challenges they faced buying retail, selling wholesale, gambling with the weather and still making a profit and creating a well balanced, wholesome environment for the kids in the family to grow up in made me realize they were probably the most savvy and intelligent businessmen I've ever known. The diversity of knowledge a young person acquires on a small farm or ranch serves well for a lifetime.

In spite of this, foolishness of youth and the incorrect perception that city kids seemed to get to do more things than I did, convinced me that agriculture wasn't a career field for me. Little did I know, later in life I would discover hydroponics and aquaponics. High-tech agriculture has purpose and appeal in our society today.

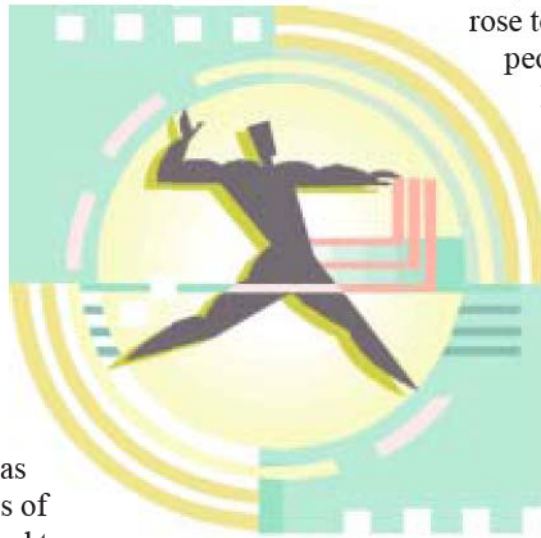
Not all collision courses are bad. Let me explain. Yesterday's computer nerds - you know the ones I mean, they were more interested in solving an algorithm than going to a sockhop - were on a collision course with an incredible need for their skills in the future. They didn't know about the coming Internet revolution, web design, search engines, etc. but what made them dot-com millionaires was the collision of the computer age technology and the skills that they possessed.

I believe that young people today in grade school, high school and college learning the technology of hydroponics and aquaponics are on a similar collision course. Small-scale, resource-poor farmers of developing nations, as well as the more developed western nations, are realizing the need for more efficient, compact food production systems...the types used in hydroponic and aquaponic designs today. Young people studying and acquiring skills in this technology are going to be in great demand in the future. Who knows, today's dot-com millionaires could be replaced by tomorrow's dot-aqua millionaires. In ancient times, people skilled in growing



food were respected and considered necessary to survival of a society. History repeats itself and this time will come again.

From the beginning of time, all that stood between man and extinction was a few inches of topsoil and a little rain at just the right time. Since crop species were domesticated between 10,000 - 12,000 years ago, agriculture has been a battle between the forces of natural bio-diversity and the need to produce food in larger quantities and under increasing pressure. Through advances in science during this century, world food production has increased and become more reliable but the problems with declining soil and water quality have the potential to reverse this trend.



In 1999, our global population rose to over 6 billion people. Yes, 6 Billion.

By the year 2050 it is estimated the population of our planet will be 8.9 billion (*United Nations World Population Prospects, 1998, see chart below*). The growing global population and declining farm land will put pressure on

farmers to produce more healthy, locally grown food.

There was a time when it seemed as though hydroponic and aquaponic food production could only satisfy a very small portion of the



BOX 1

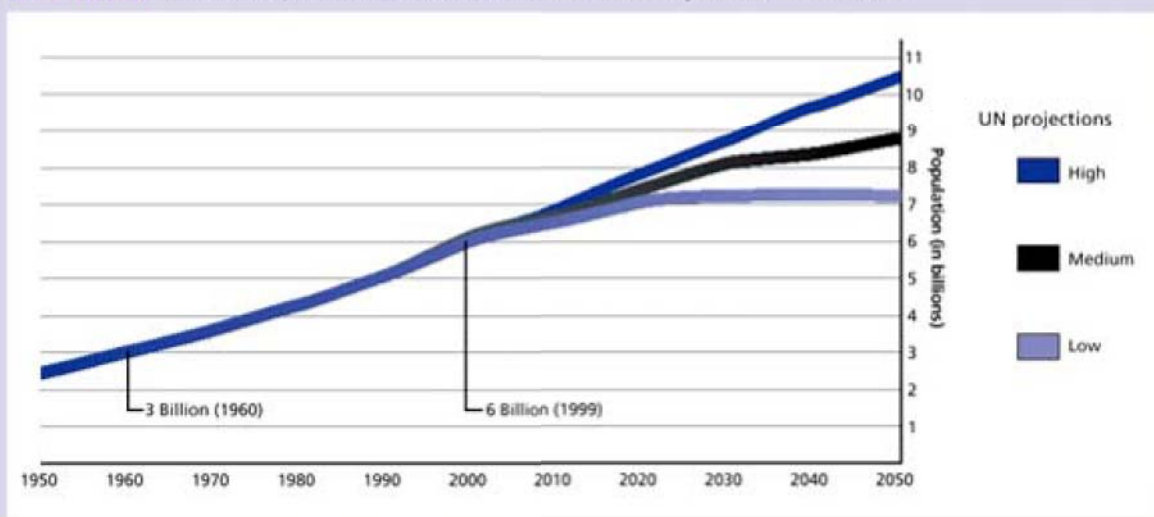
Population May Grow to 8.9 Billion by 2050

The Population Division of the United Nations Department of Economic and Social Affairs projects that world population will grow from 6 billion in 1999 to between 7.3 and 10.7 billion by 2050, with 8.9 billion considered most likely. The 3.4 billion difference between the high and low projections, which reflect

varying assumptions about future fertility rates, is as much as the total world population in 1966.

The current growth rate is 1.33 per cent. In the median projection, annual increments are expected to decline gradually from 78 million today to 64 million in 2020-2025, and then sharply to 33 million in 2045-2050.

FIGURE 1: World Population Growth, Actual and Projected, 1950-2050



Source: United Nations. 1998. *World Population Prospects (The 1998 Revision)*.

demand for produce and only provide for those who could afford premium prices. As hydroponic and aquaponic technology develops, it is becoming apparent that we could be wrong about that idea. Recent studies in China demonstrate that aquaponics can be done outdoors in existing water ways on a large scale. In addition, massive amounts of lettuce, tomatoes, peppers and cucumbers are grown in Australia, New Zealand, throughout Europe and shipped world wide.

Students are experimenting with a variety of aquaponic applications. For example, high school biology students at Mariposa County High School, under the guidance of Tammy Kudela, have researched saltwater fish and algae production in aquaponics, comparative species studies in aquaponics and growth rate analysis in aquaculture.

An encouraging aspect of the intense production of fish and plants in a relatively small space is that, as agricultural lands are being lost to urbanization, these small farms can be neatly tucked into an urban location. New small, but very profitable, family farms can thrive by incorporating hydroponic and aquaponic closed-loop recirculating systems.

There are many advantages to a small farm in an urban area. They can provide fresh, healthful, local produce and fish to their nearby consumers. A properly designed system has zero waste and recycles or uses all "waste" products. They reduce the need to transport, refrigerate and store their products thereby reducing traffic, pollution and fuel consumption. While transporting food great distances is common in the US, there are

many lesser-developed countries that don't have a system to move massive amounts of food throughout the land.

There are many hurdles to overcome to make aquaponics have a major impact on world food production for both high-end consumers and remote villages in developing nations. Dedicated researchers and commercial growers are working to overcome the obstacles. The young people experimenting with aquaponics are gaining knowledge and experience

that may guide them to be the engineers and designers of the food production systems it will take to feed the estimated 8.9 billion people in the year 2050.

The pioneers in this industry may not be around in the year 2050 but, I hope in addition to systems they design, they leave a legacy of well-informed, educated youngsters whose

interest in aquaponics has been sparked. Introducing this technology to young people may lead them to a rewarding and satisfying career that will be as necessary to society in the future as the dot-com kids were to the dawning of the Internet age.

About the Author:

John Pade, partner in Nelson/Pade Multimedia, first logged onto what is now the Internet in 1969 at the Department of Defense. He has been involved in the hydroponics and aquaponics industry for over 12 years in capacities including greenhouse construction and system design, commercial production, marketing and consulting. He can be reached by e-mail at: pade@aquaponics.com

