The Roots of Cuba's Agricultural Renascence

In: "Latin American Issues and Challenges"
Editors: L. Naciamento and G. Sousa
ISBN: 978-1-60692-349-8
2009

Paul L. Gersper
THE ROOTS OF CUBA’S AGRICULTURAL RENASCENCE

Paul L. Gersper
University of California, Berkeley, USA

ABSTRACT

In 1989 Cuba began rapidly converting its agriculture from an energy- and chemical-intensive, conventional model, similar to that used in most of the U.S.; to a low energy, organic-based, sustainable model similar to that used by Amish farmers. This wasn't done willingly by most agricultural scientists, policy makers and farmers, but rather was economically forced, due to the collapse of the Communist Common Market in 1989. This collapse plunged Cuba into an economic crisis, which they called the Special Period.

Cuba was successful in making the conversion, as verified, over a three-year period, by five U.S. Scientific Agricultural Delegations. The first delegation found the conversion had, by the end of 1992, reached the point which indicated that it had very good prospects for success. The necessary components of animal traction; organic matter recycling and utilization; biological control of crop pests and diseases; ecologically-based rotations of crops and pastures; etc.; were already in place and working. Many innovations had been developed: effective animal traction implements; cloning of superior crop plants; large-scale vermicompost production; large scale production of biological control agents; etc.... Finally, the last delegation found that, by the end of 1995. Cuba was producing enough high quality food to meet the caloric and nutritional needs of all its people.

However, the conversion had a lot of detractors and reluctant participants. Although the five delegations found the new model to be based on a unique blend of science, innovation and appropriate technology; with promise to be a workable model for practical, sustainable food production in every country; many Cubans, even among the agricultural leadership, were not proud of this. To them the new model was, embarassingly, a step backward, not forward; because it essentially was “peasant” in nature. They were particularly embarassed by their need to replace tractor traction with animal traction.
The speed and success of the conversion were due mainly to three factors; which together form the roots of the nation's agricultural renascence: Fidel Castro, whose leadership, wisdom and untiring efforts, especially since 1964, attempted to convince the agricultural community of the efficacy of applying the principles of André Voisin for sustained productivity and good health of the population; a small number of scientists and practitioners, who, for a long time, had been advocating for an ecologically sound, organically-based agriculture; and a small number of so-called "peasant" farmers who had never abandoned wisdom nor the appropriate technologies of animal traction, organic recycling and fertilization, and biological pest and disease control.

INTRODUCTION

During the early 1990s there were rumors and trickles of information circulating through the academic and scientific agricultural communities in the U.S., that there were rapid, dramatic changes taking place in Cuba: that Cuba was converting from conventional, petroleum-based, energy-intensive to sustainable, organic, low-energy agriculture. In response a broad-based group of experts was formed and became the first U.S. Scientific Agricultural Delegation to Cuba. In November 1992, this delegation spent two weeks of comprehensive, intensive study of Cuba's agriculture and reported their findings in a published report, The Greening of the Revolution: Cuba's experiment with organic agriculture, as well as in numerous published papers. I was a member of that delegation, and I also led three follow-up U.S. agricultural delegations, during 1994 and 1995. Also, I made two additional trips there, in 1993 and 1998, to participate in Conferences and to continue the gathering of research data.

The U.S. delegations visited many of the agricultural research and educational institutions, mainly in Havana, Pinar del Rio and Matanzas Provinces, as well as many of the state farms and private farm cooperatives in these three provinces. Villa Clara, Sancti Spiritus and Ciego de Ávila Provinces also were visited, from time to time, by individuals and small groups from various of the delegations. In addition to gathering comprehensive information and data about the characteristics of agriculture the delegations talked with as many people as they could, throughout the provinces they visited, to get their opinions of what had been taking place in agriculture during their lifetimes, especially since 1989: people from all walks of life and of all ages. What they discovered is astounding.

In 1989 Cuba began rapidly converting its agriculture from an energy- and chemical-intensive, conventional model, similar to that used in most of the U.S.; to a low energy, organic-based, sustainable model similar to that used by Amish farmers. This wasn't done willingly by most agricultural scientists, policy makers and farmers: but rather was economically forced, due to the collapse of the Communist Common Market in 1989. This collapse plunged Cuba into an economic crisis, which was dubbed the Special Period.

The delegations found the new Cuban agriculture to have the potential to be a model for agriculture which is truly sustainable: conserving of the natural resource base; effectively recycling organic matter, nutrients and water; cutting demands for petrochemical energy, fertilizers and biocides to a minimum; using effective biological control of crop damaging insects and disease; developing an effective infrastructure, based on appropriate technology, to produce the necessary inputs for maximizing and sustaining production; shortening the
distance between producer and consumer to a minimum; and generally working toward the ideal of making all aspects of their agriculture as ecologically sound as possible. They found the new Cuban agriculture to be characterized by: an exciting blend of state-of-the-art science and technology, practical common-sense, and indigenous knowledge; and by a contagious aura of exciting experimentation, of the exploration of new frontiers, of discovery, of creativity, of contributing to the common good, and of leaving a legacy for future generations.

**DISCUSSION**

**Characteristics of the Agricultural Renascence**

Cuba was successful in making the conversion, as verified, over a three-year period, by five U.S. Scientific Agricultural Delegations. The first delegation found the conversion had, by the end of 1992, reached the point which indicated that it had very good prospects for success. The necessary components of animal traction; organic matter recycling and utilization; biological control of crop pests and diseases; ecologically-based rotations of crops and pastures; etc., were already in place and working. Many innovations had been developed, including: effective animal traction implements; cloning of superior crop plants; large-scale vermicompost production; large scale production of biological control agents; etc. Finally, the last delegation found that, by the end of 1995, Cuba was producing enough high quality food to meet the caloric and nutritional needs of all its people.

The 1989-90 collapse of trade relations with the common market of the former socialist bloc, together with the ongoing U. S. trade embargo, had plunged Cuba into its deepest economic crisis since the beginning of the revolution. This economic crisis rapidly translated into an agricultural and food crisis because Cuba's Green Revolution-style, highly technified agriculture was heavily dependent on foreign imports, and 57 percent of the food consumed by its population was also being imported. When trade and aid dropped by 85 percent early in the post-1989 period, caloric consumption by the population fell by as much as 30 percent.

In response Cuba immediately launched the most ambitious and far reaching transformation, ever attempted by a country, from modern industrial farming to modern sustainable farming. The reformation that was taking place was truly impressive, and very important to the rest of the world as well as to Cuba, whether or not its motivation was economic necessity. It was a thorough transformation of an agriculture which had been based on an energy and chemical intensive industrial model (a destructive, unsustainable model), in which most inputs had to be purchased from other countries; to an agriculture based on an organic and skill-intensive agroecological model (a constructive, sustainable model), in which most inputs are produced locally; on an unprecedented scale and within an incredibly short period of time. For comparison, pre-1989 agriculture was very similar to that which prevails in California whereas the reformed agriculture is very similar to that which prevails in U.S. Amish communities.

In the new agriculture locally produced bio-pesticides, bio-fertilizers, and beneficial insects, bacteria, and fungi have been substituted for no longer available agrichemical imports; oxen are used in place of, and along with, tractors; intercropping and crop rotations have become commonplace; and many other technological changes abound. Resource reclamation and conservation, and environmental protection have become comprehensive and
commonplace. Large state farms have been broken up and converted into smaller private cooperatives. Farmers markets have been opened to partially free the prices that growers receive for what they produce. As a result food production is up quite significantly, and sustainable agriculture has actually become the norm. The transition has occurred most rapidly and most successfully in the previously private small farm and cooperative sectors, while the newly privatized former state farms still struggle to overcome their capital intensive history of large scale monoculture, which make their transition all the more difficult.

The delegations discovered that practically all aspects of how we collectively viewed what a truly sustainable agriculture would consist of were included or being addressed by the new Cuban model. Thus, the components of the new model comprised a comprehensive set of requirements for sustainable agriculture: improving agrarian research and development; changing agrarian education to reflect the new model of agriculture; reversing rural migration to cities; extensive urban agriculture and community participation; soil conservation, reclamation, and recuperation; water conservation and protection of watersheds; increasing cooperative use of land; development of animal traction, alternative mechanization, and alternative energy; use of appropriate technology; alternative veterinary medicine; adjusting crops and modes of production to local conditions; mixing crops and animal production; intercropping and crop rotation; extensive production of organic fertilizers and biofertilizers; nation-wide application of integrated pest management; comprehensive waste recycling; and focus on food quality as well as quantity.

A year before the first delegation arrived in Cuba, Fidel Castro gave a speech in December 1991 in which he described early developments in the Special Period. In the first part of his speech he talked about the work-study program: explaining that finally the Special Period forced the issue of putting gardens on land adjacent to elementary and secondary schools, throughout the country, to support the agricultural work-study program; a plan that had been advocated by the government, and especially by him, personally, for many years prior to the Special Period.

He went on to describe many of the changes that have already taken place in the country's agriculture: "Today we have to fertilize with bacteria. Today we have to use biological pesticides, wage the biological fight against pests and diseases. Today we have to rapidly create new plant varieties based on tissue cultures and even cells. We have already succeeded in producing the first sugarcane plants from a single sugarcane cell... We are doing many things like this which show a lot of potential. The reason is to solve problems in our agriculture, just as the Voisin rational grazing system, applied in a rigorously scientific way, should solve the problem of the lack of cattle feed... We are carrying out an accelerated program of 6,000 rational grazing areas with electrified fences. Researchers and innovators have participated in this, people who have thought up little machines to grind cane and produce sacharina for the cattle there. This sacharina came from our research centers. People are working as teams to produce electricity in the event the electrical system fails, so that they can have electricity for the fences, produced by wind or by hand. In short, they have had to find many solutions."

He then turned to the importance of animal traction to the country's future: "This situation, of course, is going to promote the country's scientific development tremendously, because without the special period we could not even dream of the boost many things have received in our country. The same is true of the use of oxen. They had been forgotten. Everything was done with tractors. Now we have discovered that oxen not only save fuel in
many activities. Oxen also raise human productivity, because there are times when because of the wetness of the soil or the size of the crops, you cannot send in a tractor. It would destroy everything. It would compact the soil. But a man or woman can enter the fields at any time with oxen." He added an admonition: "Now we have discovered that the day we have enough fuel, we cannot simply return to the age of the tractor and that is all." He went on to explain: "Sometimes things are clear, obvious, and reasonable, and you can try to convince them, but only when they see the urgent need, and have no alternative, do they look at oxen. Gentlemen, we must domesticate oxen, but as long as there is one drop of fuel, it is a difficult battle to get oxen domesticated. That is what human beings are like. They have those characteristics, and they often need the force, the push from necessity to solve certain problems. That is what is happening to us with the special period."

He made a final plea for everyone in the country to think in terms of self-sufficiency and of innovations in increasing production: "I believe that now the importance of the issue of participating in productive activities must be emphasized as much as possible, especially where we can, which is in the fields. The goal of self-sufficiency must be emphasized as much as possible, where it is possible, as a very important task during this special period. Think of it: There are a million students who must be fed. Half of them must be given breakfast, lunch, and dinner every day. Others must be given lunch. This includes the universities, secondary schools, semi-boarding schools, child care centers, etc. Self-sufficiency is very important. Of course, the country is making great efforts to produce food for the national plan, but whoever plants a garden in the tiny plot of land in the courtyard of their building is helping the country in this special period. They are saving transportation of fuel. They are helping: everyone who plants something, everyone who does something."

Fast forward 12 years, to 2003, when a very large delegation of 90 food and farming specialists from all over the United States, Latin America, and the Caribbean took a two-week study tour of Cuban agriculture. They found that the new Cuban agriculture was still on track, and had made considerable progress since the last of the original five delegations had visited the island nation. Most of the comments which follow come from three newspaper articles written by members of that delegation.

First some random, general comments from members of the delegation. An organic farmer with the delegation declared that Cuba's organic agriculture was quite remarkable and at the "top of the world," adding that "the quality of their produce is consistently high, which shows they have the infrastructure in place." Other delegates remarked: Cuban agriculture challenges "all conventional assumptions about progress and feeding the world," adding that green revolution promoters "should go get some insights from one of the most fascinating farming experiments in the world," and "Cuba's organic food movement has made the country a world leader in low-input sustainable agriculture."

The results of Cuba's conversion to organic agriculture was described to be widespread, diversified, well-distributed, and amazing, although not yet complete; consisting of vast "networks of sustainably run, smaller plots of ground that emphasize cooperative labor, local marketing, farm-based enterprises and a farm's inherent responsibility to the social fabric of its community."

Very little urban agriculture was evident to the 1992 delegation, but three years later the fourth delegation discovered a dramatic increase in urban, suburban, and exurban agriculture; especially in the form of organoponicos. Organoponicos are mostly raised bed vegetable plots constructed with deep root zones (usually one-half to one meter), enriched with compost,
fertilized with biofertilizer, irrigated, and protected from pests and diseases with biological control agents. They are very productive and produce vegetables year round.

By the time of the 2003 delegation organoponicos had greatly expanded. They reported that there were thousands of organoponico plots (gardens), ranging in size from less than one acre to six acres, and totaling 81,000 acres. They further reported that the gardens were producing 250 pounds of food per year for each of Cuba's 11 million people, and have generated 300,000 high-paying jobs.

They reported further that, "because of free-market incentives established by the government in response to the crisis, there is now enough organic produce grown within the city limits of Havana to feed each of the city's 2.5 million residents a minimum of 300 grams (about 10 ounces) of fruits and vegetables each day." Growers buy "seed, organic crop protection products, natural fertilizers and technical assistance from a 'tienda consultoria,' or consulting store in the neighborhood." They "earn a salary, plus incentives based on production." Furthermore, after meeting required production quotas, they can "sell what's left over to the public." They conclude that, "the key to the success of urban agriculture in Cuba is that the farms are located in the same neighborhoods as their customers."

Some of the other highlights reported by the 2003 delegation follows.

"Once food production spontaneously evolved toward decentralized, market oriented, organic production, the government began coordinating and supporting further progress. Virtually all university research in agriculture is oriented to helping solve practical questions. Small manufacturing plants dispersed around the island turn out biological pest control supplies and small-scale agricultural tools. Every square mile in Cuba has someone charged with scouting for pests and diseases."

"This transition of Cuban agriculture is characterized by not only different methods but also different ownership patterns. Most state farms have been broken up into individual and cooperative farms, and a large portion of the daily Cuban diet is grown close to home, on small farms and gardens dispersed through and around the cities."

"Most of the large, state-owned farms have been divided into smaller cooperatives, of Basic Units of Cooperative Production (UBPC), as they are called, with farmers earning approximately four times the national average monthly wage. They achieve this despite the fact that such farms must first provide, as part of their social obligation, food for local schools, hospitals, and nursing homes before selling on the open market."

"The Cuban government still buys a lot of food and guarantees every person a basic diet at very low, subsidized prices. All vegetable farms of significant scale supply schools, daycare centers, and hospitals with low-priced produce."

In addition to these regulated channels, however, many food items are also available on a free market, making food ever more abundant, and returning to farmers among the very highest incomes in Cuba."

"The agricultural curriculum in the universities and vocational high schools in Cuba has been completely revamped to reflect the change from high-input, industrialized agriculture to a low-input, organic system."

"Vocational agricultural high schools are producing biological pesticides that they sell. Income from the sales provides as much as 50 percent of some schools' budgets."

"Another key has been the reinvention and rejuvenation of university extension services. Throughout the country, extensionists, as they are called, adhere strictly to a model of "popular education" that is described as "emancipatory" in nature. By this model, the teacher
is never considered more important than students, but both learn and share in the process together."

"The principle goal of extension services in Cuba is to integrate new technology in support of traditional production systems. Farmers are thought to be the best judge of what to produce and how it should be done."

"The Cuban government eventually hopes to divest itself of all agricultural enterprises except for livestock and crop genetics."

The Reluctant Converts

Out of necessity, things changed. However, the conversion had a lot of detractors and reluctant participants. Although the five delegations found the new model to be based on a unique blend of science, innovation and appropriate technology; with promise to be a workable model for practical, sustainable food production in every country; many Cubans, even among the agricultural leadership, were not proud of this. To them the new model was, embarrassingly, a step backward, not forward; because it essentially was "peasant" in nature. They were particularly embarrassed by their need to replace tractor traction with animal traction.

Without a doubt Cuba has been successful in rapidly converting its agriculture from an energy- and chemical-intensive, conventional model, similar to that used most of the U.S.; to a low energy, organic-based, sustainable model similar to that used by Amish farmers. Such a conversion had never before been done on a national scale. This was a very impressive accomplishment. And this, together with the fact that the new Cuban agriculture could serve as a viable model which could be emulated by any other country of the world did not seem to make a difference; because there were still many reluctant converts who could not wait to convert back to their previous "modern" agriculture as soon as the economy allowed it.

There are still detractors and reluctant participants; although the number has considerably decreased over the past 19 years. However, the big question remains: will Cuba scrap the sustainable model and return to the industrial model if and when her economy would allow it? The reason for this uncertainty about the future of the sustainable model of agriculture in Cuba, and elsewhere, has to do with attitudes, perceptions, and perverted logic. Unfortunately, attitudes and perceptions held by farmers, researchers, policy makers, and others in the agricultural community strongly influence, if not dictate the characteristics of agriculture whether or not they are based on reality or common sense (this is examined in detail below in the section about the Amish).

One of many examples which could be used to illustrate this, and which quite obviously pertains to present day Cuba, is tractor versus animal traction. Many of the key people in Cuba, who members of the delegations became acquainted with, were not able to hide their embarrassment over being forced to give up their "modern" agriculture for a "peasant" agriculture. They were particularly embarrassed that they had to revert to oxen to meet most of their traction needs. Moreover, they clearly considered these reversions to be stopgap measures until the economy improves.

The Cubans, of course, are not alone with this attitude, because most people perceive tractor traction as being a necessary component of modern progressive agriculture; to the exclusion of animal traction. However, the perverted logic which underlies this perception
ignores the truth about vulnerability to adverse economic conditions, as well as the environmental consequences of dependency on tractor traction— even when animal traction can be demonstrated to be unquestionably more appropriate, more feasible, and more profitable than tractor traction. Fortunately, the productivity enhancing and environmentally sound characteristics of animal traction are becoming increasingly apparent in Cuba. For example, oxen can enter the fields after rains to prepare the ground when tractors cannot, and, unlike heavy machinery, they do not needlessly compact the soil.

Along the same lines, perverted logic and linear, reductionist thinking also explains the widespread dependency on synthetic pesticides in world-wide agricultural production even though common sense and holistic thinking clearly show that it is not possible to achieve sustainability as long as synthetic pesticides continue to be used as the agents of choice in pest control. Fortunately, Cuba is leading the way in biological control technology which can serve as a model for the establishment of sustainable agricultural systems throughout the world.

The Roots of the Agricultural Renascence

The speed and success of the conversion of Cuba's agriculture were due mainly to three factors; which together form the roots of the nation's agricultural renaissance: Fidel Castro, whose leadership, wisdom and untiring efforts, especially since 1964, attempted to convince the agricultural community of the efficacy of applying the principles of Andre Voisin for sustained productivity and good health of the population; a small number of scientists and practitioners, who, for a long time, had been advocating for an ecologically sound, organically-based agriculture; and a small number of so-called "peasant" farmers who had never abandoned wisdom nor the appropriate technologies of animal traction, organic recycling and fertilization, and biological pest and disease control.

The Influence of Andre Voisin

The November 1992 delegation worked around the clock during its two weeks in Cuba: visiting representative facilities of all major government and university agricultural organizations: including research and development laboratories; experiment stations and experimental farms; state farms and cooperatives; and production facilities for the production of composts, biological control agents (beneficial bacteria, viruses, and insects), cloned plants, etc... We also visited many private farm cooperatives; urban and institutional gardens (school, retirement home, and work-place gardens); and food markets.

Almost immediately we noticed that at the entrance to many of the laboratories and other buildings there usually was a sculptured bust of the famous French agronomist, Andre Voisin. Furthermore, inside the buildings, usually in a meeting room, there often was a large portrait or photograph of Fidel Castro with Andre Voisin. Inquiries resulted in very little information as to who Voisin was or why he was so celebrated. However, it was very clear that he was considered an important figure to the agricultural establishments in Cuba. The following year, the author read the new book, Fidel Castro, by Robert Quirk, and the mystery as to why Voisin was so celebrated was cleared up. The amazing story of the relationship between Fidel Castro and Andre Voisin unfolds in Quirk's book, and clearly indicates the leadership, wisdom and untiring efforts of Fidel Castro, starting in 1964, in his attempts to convince the
agricultural community of the efficacy of applying the principles of Andre Voisin for sustained productivity and good health of the population.

Quirk described a conversation between Fidel Castro and Richard Eder, resident correspondent for the New York Times, as they took a tour of agricultural experiment stations near Havana. As Eder was being driven by Castro in a jeep, he noticed on the floor of the vehicle a book on grasses (The Dynamics of Pastures) by the French agronomist, Andre Voisin. He told Eder that after reading Voisin he was convinced that grass feeding for cattle was both cheaper and more efficient than dry fodder feeding.

He added that, "Castro was overflowing with information," telling Eder that "eighty percent of his time was spent 'pushing agriculture.'" He boasted that, "even your agriculture in the United States will be less scientific than ours. Many of your books are very good on established techniques, but they fail to bring in new ideas," adding that, "American farmers will be visiting us before long to see how we are getting on. We shall hold a prominent place in the world's agriculture."

Eder's accounts make it abundantly clear that Castro had a very strong personal interest in agriculture, was convinced that Cuba had a tremendous agricultural potential, and was determined that under his leadership she would fulfill that potential.

Furthermore, it is also clear that from the beginning Castro was searching for ways the country could develop a healthy, sustainable agriculture: which explains his attraction to Voisin. Thus, Quirk described Fidel Castro's affair with Voisinism as a "veritable love match-ardent and star-crossed." Quirk then described why Castro had extended an invitation to Voisin to visit Cuba. "Convinced that the French agronomist's theories on pastures and livestock production would give Cuba the finest cattle industry in the world, Castro invited him to conduct a series of lectures in Havana. Voisin accepted. His work was famed throughout Western Europe, and his sixty-acre farm in Normandy was a mecca for the agriculturalists who espoused natural methods of animal husbandry. He was a member of the French Academy of Agriculture, and Bonn University had awarded him an honorary degree. His most important books had appeared in English, German, Russian, Hungarian, and Japanese translations. He proposed a system of rational grazing that would maximize milk production with minimum damage to the soil."

Castro's great respect for Voisin's writings and the promise they held to rejuvenate the country's agriculture is revealed as Quirk continued: "In the throes of his initial enthusiasm, Castro determined to make Voisin's works available on every experimental cattle farm in the country. He summoned Heberto Padilla to his office. The prime minister showed him a copy of "Grass Productivity" and a list of volumes. Go to Spain, he said, and get two thousand copies of every one. In Madrid the publishers received Padilla with astonishment. They had never handled such a large order before. At great cost the thousands of sets were packed up and flown to Havana. When they arrived at Jose Marti Airport, Fidel Castro was at the terminal to see them unloaded. For two months Voisin worked assiduously at his farm, preparing the text of his lectures. In September he sent them to Cuba to be translated. At two in the morning on December 3 he arrived in Havana to be greeted by Fidel Castro with an effusive embrace. For the fifty-six-year-old agronomist and his wife it was a difficult, arduous flight."

Quirk described that after escorting the couple to the house that had been reserved for them, Castro began almost immediately talking about grasses and in his enthusiasm he completely forgot about everything else. "Words flowed unimpeded by any sense of time or
place. He left them at 6:00 A.M., dazed and exhausted. It was noon in Paris. They had been awake and busy all night."

Quirk then wrote: "For a week the Voisins visited experimental farms and historic sites and were treated to fiestas, receptions, and state dinners. Castro spared no expense or effort in his attempt to impress the scientist with the accomplishments of his revolution."

He added: "Delighted by the homage paid to him by important government figures, Voisin ate, drank, and conversed with the vigor of a man twenty years younger."

Quirk then described a remarkable event which not only demonstrated the great esteem and admiration which Castro held for Voisin and his published works but also clearly revealed Castro's strong personal interest in leading Cuba to agricultural greatness: "On the evening of December 8, 1964, the prime minister inaugurated the lecture series by introducing Voisin to the Cuban people. After the French ambassador had said a few words, the agronomist spoke briefly, thanking Castro for his hospitality. The prime minister, he said, had given him a book, beautifully bound, that contained a translation of his lectures—and in a short time. A truly remarkable effort. Castro spoke last, for more than two hours, without notes of any kind, upstaging the French diplomat and the renowned scientist. In an astounding tour de force he presented the gist of Voisin's lifetime of research. Even his closest, longtime associates were dazzled by the effectiveness and completeness of his summary."

What Quirk next writes about Castro and Voisin is even more remarkable: "The next day the eminent visitor presented his first lecture at the National Medical College, "The Soil and Fertilizer Produce the Animal," with the prime minister in attendance. He repeated essentially what he had written in his books and Fidel Castro had summarized on December 8. Revolucion declared the Frenchman a "genuine revolutionary" and living proof that the technical revolution was beginning to become a reality in Cuba. Other lectures followed, and Voisin continued his dizzying round of dinners and sightseeing. The strain was too much. On the evening of December 21 Castro appeared at the college auditorium to say that Voisin had died of a heart attack earlier in the day while touring a state farm. His funeral would take place the next day at the university, he said. At the obsequies, the Maximum Leader was once again the center of attention as he gave the funeral oration. He had persuaded the widow, Marthe-Rosine Voisin, that her husband would have wished to be buried in Cuba. Each year thereafter, the agronomist's death was memorialized, and Mme. Voisin was brought back to Havana for the ceremonies."

On my next trip to Cuba after reading Quirk's book I was determined to verify as much as I could of his account of Andre Voisin. I started by asking one of my Cuban colleagues to help me find the tombstone of Voisin, to verify that he had indeed been buried in Cuba as the account stated. We decided that, given the esteem and honor in which Voisin was held by Castro, according to Quirk, Voisin would likely have been buried in the main cemetery of Havana. My colleague told me that he would be especially happy to take me there because that was the cemetery in which his parents and other relatives were buried. We spent several hours in attempting to locate the Voisin tombstone, and decided to give up. But before leaving my colleague wanted to visit the graves of his parents. While he was doing this I decided to take some photographs of this exceptionally beautiful cemetery. Nearby there was a striking black-marble tombstone, which stood out from the surrounding predominantly white-marble tombstones. I took a picture of it from a distance and decided that its uniqueness merited a close-up. As I positioned myself for a close-up I was shocked to see the name of
Andre Voisin prominently carved in the stone. I was also surprised to see that it was a double tombstone, and carved on the other half was the name Marthe Rosine Voisin - Voisin's widow. I was unable to find out whether his widow was buried there or was still alive; but several inquiries I made indicated that she was not yet buried there. I'm unsure if Quirk was aware of where Voisin was buried, but my discovery verified his account of the event.

After reading Quirk and verifying that Voisin was indeed buried in Havana, I was still somewhat puzzled at the attraction which Castro had for the French agronomist and especially the reasons behind Voisin's burial in Cuba. Eventually I was successful in obtaining copies of the two speeches referred to by Quirk: Castro's 12/8/64 speech inaugurating the Voisin lectures and his 12/22/64 speech at Voisin's funeral; and these provided the answers I was seeking.

In reading the transcript of the 12/8/64 speech, it is easy to conclude that Quirk's description of it as a tour de force is an understatement. The speech indicated that Castro not only had read Voisin's books, but also understood them very well; and the fact that he gave the speech without notes also indicated that he retained the information very well. In the speech Castro describes in some detail the contents, applications and importance of the three Voisin books which he had read: *The Productivity of Grass; Soil, Grass, Cancer* and *The Dynamics of Pasture* (the first book which Castro read, and the one which introduced him to Voisin).

Also in the speech are numerous comments which relate to Castro's admiration and respect for Voisin, and his purposes for applying information from Voisin's books, and especially Voisin's suggestions and recommendations, to the benefit of Cuban agriculture. The following selection of excerpts from the speech are illustrative.

"And here is one of the most interesting aspects which has attracted our attention in the scientific works of Professor Voisin. It is the human aspect of his scientific research and the contribution from a point of view which is entirely new."

"It can be said that Professor Voisin, in addition to being a scientist, is an apostle of man, an apostle of the health of man and above all an apostle of preventive medicine."

"It was through the books of Professor Voisin that we first found, saw, read, and listened to a different point of view. It was the first time in my life that I had heard it said that one tomato might have three times as many vitamins as another of the same variety, depending on the way the tomato was cultivated."

"That was the first time we were able to understand that our future contained the possibility, under the conditions offered by our social system without the interference of commercial interests, of establishing production that would take into account not only quantity, but quality as well."

"It is exactly there where Professor Voisin points out the path for the development of preventive medicine, which consists precisely of giving the organism all the elements which the organism needs to develop its own defense against the attacks of foreign agents: bacteria and viruses."

"Professor Voisin has a book which has not yet been translated into Spanish, called *The New Scientific Laws for the Application of Fertilizers*, in which he explains the mechanisms through which plants absorb elements, produce vitamins which the human organism later assimilates."

"We will not move toward development of an agricultural technology that seeks quantity alone. We will seek quantity and quality of our food."
"A day must come when each and every one of the products consumed by the population will have a maximum, optimum biological value. This must be the aspiration of our agricultural technology."

"We are also going to carry out an intensive dissemination campaign on the whole problem. We have acquired, so far, nearly 20,000 books on these three subjects: The Productivity of Grass; Soil, Grass, Cancer; and Dynamics of Pastures."

"Professor Voisin has had the kindness to give our country the rights to publish one of his books, the one that deals, as I said, with the scientific laws governing the application of fertilizers. He told me that the rights he granted us should be used to compensate for the damage caused our country by Hurricane Flora. He has also granted us the rights, for the same reasons, to the 10 lectures he is going to deliver -- lectures, as he has explained here, on which he worked hard for months. These lectures have already been translated and printed in book form in our country."

"We have acquired approximately 1,300 copies of each of his books. We will probably acquire some 15,000 or 20,000 additional copies. However, this will still not be sufficient. If we have newspapers that reach 200,000 or 250,000 copies; if we publish each of these lectures in the newspapers and these issues are read in the fields, many people will be able to gradually compile their own books. Thus our newspapers will have a new function, not simply to publish news and information, but to disseminate technical and scientific matters."

"We not only aspire to develop an advanced technology, but we can aspire to develop it in a new dimension that does not only measure the quantity, but the quality, in a much broader and profound human dimension. It could be said that it is possible for us to become the first country in the world in the development of agriculture according to new concepts."

The speech given by Castro at Voisin's funeral verifies Quirk's account except in one detail. It appears from the speech that the request for Voisin to be buried in Cuba came from Voisin himself, as expressed to Castro by Madam Voisin, instead of, as Quirk wrote, Castro persuading the widow that her husband would have wanted to be buried in Cuba. This is clarified in one of the following four excerpts from Castro's broken-hearted eulogy.

'Madame Voisin, ladies and gentlemen: It is difficult for us to believe that we have come today to accompany to his tomb one whom we received with hospitality and happiness only a few days ago and who was the esteemed guest of our country. Among the many persons who have read the works of Professor Voisin in various parts of the world and in different languages, I could not imagine that the bitter, very difficult task of uttering these words of farewell would fall to me.'

'He was a scientific man. His concept was a universal one. He did not consider science the patrimony of any one man or the patrimony of a country. He was aware that his research would be of benefit to all men, in any part of the world, without regard to frontiers. That universal characteristic of this thinking was displayed in his conduct, by the many trips he made throughout the world, the interest he showed in the problems of a small country like ours. That universal characteristic was demonstrated in his opinions, in his ideas expressed on repeated occasions to his wife that -- according to the way she told it -- he said that if he died in any country where he went to do some studying or went to give some lectures, he wanted to be buried in that country."

'He said, or expressed, or wished something perfectly understandable to us when he said that he wished to rest where he died. He knew that he had a right to aspire to that, because as a good and noble man, he knew that those sentiments have universal acceptance. As a man of
science, he knew that science has universal value. As a man aware that he was working for mankind, he knew that whatever nation in the world could shelter his remains—that he had the right to rest respected and in peace in any corner of the earth. Our land, for example, where the remains of Professor Voisin will rest, was therefore also his land. He had a right to our land just as we all have a right to his ideas, to his efforts, to his scientific work."

"He and men like him belong to all countries without distinction as to borders, and countries without distinction as to borders belong to him and to men like him. It can be said that when our university awarded him the title of doctor honoris causa, a degree he accepted with joy, enthusiasm, and pride, it was not an honor bestowed by our university on Professor Voisin; it was a great honor for our university to be able to have Professor Voisin among its doctors honoris causa."

Madam Voisin remained in Cuba for at least 11 more days after the funeral, as indicated from the following excerpt from the speech delivered by Castro in Jose Marti Square on the occasion of the 6th anniversary of the Revolution.

"I have heard that several of you have mentioned Professor Voisin, and I believe that it is a very apt gesture. It shows the capacity of our people to understand, to aspire, and to thank those men who have devoted their lives to research which can be useful to all people. I am certain that your spontaneous sentiments will be an additional source of inspiration and consolation to Voisin’s widow, who said that she wanted to remain in Cuba today to be with the Cuban people on this, their day."

**Fidel Castro’s Attempts to Improve Cuba’s Agriculture**

After these verifications of Quirk’s accounts of the Castro-Voisin relationship, I was highly motivated and determined to find out more about Voisin’s visit to Cuba and its impact on Cuban agriculture. I was pleased that as I began to routinely inquire about Voisin and the agricultural practices which he espoused, such as rational pasture rotations and the need to increase the organic matter and nutrient content of soils for improved health of humans and animals, I found people who either recalled or had heard about Voisin’s visit, his books, and Castro’s promotion of his principles and practices. As my research progressed on this subject, one question kept popping up in my mind: as the head of state, and a supposed dictator at that, why didn’t Castro simply force the adoption of Voisin principles and practices by the agricultural establishment? Why didn’t the government simply dictate to the agricultural establishment how agriculture should be conducted? As it turned out Castro’s advocacy was mostly ignored, until the economic crisis of 1989-90, even though he was persistent over many years and attempted to influence the establishment not only by his words but also by his example of personal experimentation. My inquiries revealed that about the only people following Castro’s wishes, that farming in Cuba follow along the lines advocated by Voisin, were: most of the ten percent of farmers in the private sector, who had always farmed organically with oxen; and a small number of agricultural researchers who were experimenting with organic production and biological crop protection. Finally, at the onset of the Special Period, Castro’s advocacy of Voisinism quickly came to the fore: to essentially provide the base upon which the nation’s agriculture was reformed.

From the beginning of the revolution Castro was very active and visible in urging his countrymen to work toward making Cuba a paragon of agriculture. Moreover, as early as 1964 it became evident that he was inclined toward promoting a more natural, innovative agricultural system than was taking place in most of the developed world: a system that we...
now call sustainable. His vision that the nation’s prosperity would be built on a strong agricultural economy surely provided the motivation for his actions: including copious personal experimentation and voluminous reading of books on a very wide range of agricultural subjects.

Quirk’s book, especially chapter 16, covering mostly 1964, provides abundant evidence of this. Quirk wrote: “In early August, Castro spoke to a forum on irrigation and drainage. He was making a ‘small experiment,’ he said, to test the effects of measured amounts of rain on the growth of cane. And he had planted grasses to determine how different varieties grew. He took the country’s agronomists to task for the ‘backwardness’ of their agricultural techniques. Cuba was the largest producer of sugar in the world, he said. Yet the average output was a ‘shame.’ Growing crops should be simple. It was just a matter of water and fertilizers. Technology was the key to improvement, and Cuba would train fifty thousand technicians by 1970. In September he addressed meetings of medical doctors and sugar producers. To both groups he decried the low level of technology. Open any book on sugar research, he said, and you will find a reference to Java, India, Hawaii, or the Fiji Islands. But never to Cuba. Too many Cubans thought they knew ‘something’ about everything. ‘But when I read a book, I come to the conclusion that people here know practically nothing.’”

Quirk’s next paragraph is even more illuminating: “He told them he planned to compile a list of all the available works on agriculture, to reproduce thousands of copies and distribute them to experimental farms. He conceded that he was not a sugar specialist. ‘That is not my work.’ But he read and thought. And he carried out some ‘small tests’ with cane plants. Everywhere he went he had pointed to the need for more experimenting. ‘Naturally, I think that in the main the idea went in one ear and out the other.’ So he made his own tests, to establish how far apart cane should be planted, what the best fertilizers were. He checked different cover crops -- cowpeas, velvet grass, canavalia, legumes -- to learn which best replenished the soil. He would test when to plant, when with nitrogen and when without, which strain of cane produced the greatest yields, why plants were diseased. He had ‘read a book’ about ‘all these things.’ Some-day, he predicted, medicine and agriculture would be united in biochemistry and the science of soils. When he spoke of advances in agriculture, he talked rarely of the United States and never about the Soviet Union. His books and articles now came almost exclusively from Western Europe.”

The following five random excerpts, in which Quirk gives details of what Castro said in his speech given at the December 8th ceremony to introduce Voisin to the Cuban people (which inaugurated Voisin’s lecture series) indicates that Castro was already totally sold on Voisin’s methods of production and the rationale for them.

“When he first read ‘The Dynamics of Pastures,’ said Castro, he had already acquired an interest in the problems of livestock. ‘I began to organize a small farm, part of which was devoted to legumes.’ He made estimates. ‘On one occasion I thought of figuring how much milk would be obtained per pound of maize and how much per pound of soybeans, and what part of that area should be devoted to maize and how much to soybeans. . . . I looked at the amount of protein contained in a pound of soybeans and the amount in a pound of maize, and the amount of soybeans and maize to be produced in those hectares, assuming that all the crops would grow perfectly well, and the production would be optimum. Moreover, I saw that the maize and the soybeans, which covered approximately one-eighth to one-tenth of the area, should produce approximately one-eighth to one-tenth of the milk. I asked myself where the extra milk was coming from, and I realized that it came largely from the pasturage. I realized...
that the areas devoted to grass would, with normal yields, produce more milk than the area
devoted to grains, presupposing optimum yields. Not only that. The area of grass would
produce milk far more cheaply, because the other crops had to be planted twice a year, every
year, and pastures would be sown only once.' Voisin's book, he said, promoted a system of
permanent grassland. 'One could see the enormous advantage of the permanent pasture over
the temporary pasture.'"

"The condition of the soil, the 'soil poverty,' he explained, was directly related to the
amount of microfauna and the number of earthworms. The point was not to cultivate, not to
resow, the grasslands. Otherwise, the organic material, the humus that had accumulated over
the many years, would be exposed to oxidation. Though grass production in the first years
was enhanced, the greater part of the organic material was used up. By the third and fourth
years the microfauna and earthworms has practically disappeared. The earth had become
compacted. And even without plowing or rotation, he said, there would be a period of soil
poverty before fertility was restored. In Cuba, however, superior conditions would minimize
this effect through the introduction of organic fertilizers. His experiments had demonstrated
that cattle in Cuba deposited three times as much manure as those in Europe. Suffice it to say,
he had never thought of any of these matters, nor had he heard any technicians speak of them,
before he saw Voisin's publications."

"The French scientist's most recent book, 'Soil, Grass, and Cancer,' was perhaps even
more important. Voisin was an exponent of preventive medicine. He had analyzed the
influence of the soil on man's health. A number of human diseases depended on the food
consumed and on the condition under which that food had been produced. He had stressed
the necessity of close cooperation between farmers and medical doctors, and he had already
suggested that Cubans organize a school of human ecology. They could thereby make
'extraordinary progress' in preventive medicine, Castro said, because they could work
without interference of commercial factors in matters that concerned health. Revolutionary
Cuba could develop a medical system that would avoid the necessity of going to the hospital
- not curing a man in the hospital, but avoiding his ever having to go there in the first place.
And suddenly for the first time, like an epiphany, he saw in agriculture and in health
maintenance the greatest advantage of the socialist system. 'It was truly a revelation!' People
had been abusing their health by the indiscriminate use of antibiotics and fertilizers. The
prevailing agricultural methods destroyed important microelements in the soil and created
'hidden hunger.'"

"In the 'natural state' of the soil, explained Castro, there was a balance. But man, to
increase production, had upset that balance. He plowed the land. He applied fertilizers high
in nitrogen and used plant varieties with a greater ability to metabolize the elements. As a
consequence, the soil was robbed of important elements, and only four -- nitrogen,
phosphorus, potassium, and calcium -- were returned. Commercial food growers returned
only those elements that permitted them to obtain the largest crops, so foods contained less
and less of the elements essential to life. For example, Castro said, an excess of potassium
made calcium, sodium, magnesium, and boron inassimilable. Too much phosphorus caused a
deficiency of zinc and copper. The continual application of nitrogen made soils acid and
caused a deficiency in phosphorus and molybdenum. And a diet lacking in those elements
meant a deficiency of certain vitamins."

"To read Voisin's words, said Castro, was to see dialectical materialism in action. The
decadence of ancient civilizations was brought about by great urban concentrations that had
led to the exhaustion of the land, to the production of vitamin-deficient foods. Through the sewers of Rome and Babylon had flowed the fertility of the soils. And as the farmlands became exhausted, a physical and moral degeneration of the inhabitants ensued. Cubans too had concentrated too much in the cities. They must look once again to the countryside. The revolution would see that they did. Because of the planned economy, Cuba's future looked bright. 'We have a country in which everyone has learned to read and write, in which almost a million adults are studying, a country that is the master of its resources, the master of its lands.' Few countries in the world had as many advantages as Cuba. He had given each comrade in the fourth year of medical school a copy of the Voisin book on soils and disease, he said, 'made them promise to read it . . .'

These descriptions by Quirk of Castro's activities in advocating and promoting improvements in Cuban agriculture are verified in the transcripts of Castro speeches, as well as by farmers and agricultural professionals consulted by members of four of the U.S. agricultural delegations during the 1990's. It is abundantly clear from the information derived from Quirk's book, transcripts of Castro's speeches, and the extensive information derived from many people in Cuba by members of the 1990s delegations, that Fidel Castro not only was steadfast in his attempts to improve Cuban agriculture but to improve it in ecologically sound ways, with the goal of sustaining the health and welfare of each and every one of present and future generations of Cubans.

Another strong indication of this assessment was an unusual finding by the 1990's delegations: that of a head of state casually, and frequently, visiting farmers and farm families. On their many visits to state farms, agricultural cooperatives, and private farms delegates were struck by the many displayed photographs of Fidel Castro posing with farmers, farm families, farm workers, and cooperative members. The photographs were mostly the informal type of personal family snapshots that are commonly found in most homes. Furthermore, when discussing the photographs Fidel was generally described as a member of the family. Over and over again the story was the same, Fidel would drop by for a visit, unannounced and often either alone or in the company of one or two other visitors. Furthermore, he often came around meal time and usually would dine with them. They often described how much Fidel loved them and their fellow countrymen and how much he inspired them to be good farmers and citizens.

Another very strong indication of this assessment was discovered by members of the 2003 delegation. They reported that a senior professor at the Agrarian University of Havana told them that when he received his degree in Agronomy Fidel Castro personally gave him and every other member of the graduating class a copy of Rachel Carson's book, Silent Spring. This was in 1963, just as Cuba was beginning to wholeheartedly adopt a chemical intensive, highly mechanized, Green Revolution style agriculture.

Obviously, as it turned out, Fidel Castro, like those described below, was a "voice in the wind."

**Voices in the Wind**

The seeds of agricultural change in Cuba were present throughout the first thirty years following the Revolution; and agrarian reform had always been a priority of the Cuban socialist regime. Furthermore, from the beginning, the Revolution had sought to guarantee adequate food for every person in Cuba, as a birthright; and the desire had been to supply as much of this food as possible through production, using fewer chemicals, on smaller farms or...