

Course Code Number (credits) and Title
Field Studies in Sustainable Agriculture – Tour of Cuba
AGRO 490 Topics on Agroecology; OR
AGRO 497 Directed Studies, OR
AGSC 490 Topics in Agricultural Sciences
DATES May 1 – 22, 2006

Course calendar description:

Prior to the early 1990's, Cuba's agriculture was characterized by large-scale monoculture. With one of the highest ratios of tractors to farmland in the world, Cuba had fully adopted the so-called "green revolution" model. Yet when crisis intervened (collapse of the Soviet Union and with it an abrupt loss of farm inputs such as chemicals, machinery, gasoline, feed grains, etc.), Cuba managed to reinvent herself, becoming in one decade — virtually overnight — a world leader in organic agriculture and urban agriculture. How was this possible? What lessons does Cuba offer for other Latin American Countries? What lessons does Cuba offer for Canada? In this 3 week course, students will visit Cuba's farms, agricultural universities, research stations and urban agriculture centres to explore the Cuban model and understand its relevance for agriculture in other countries, in particular Canada.

Rationale for the Course:

Like the ecological importance of riparian zones that link water and land and support biodiversity, the socio-economic importance of farm communities – which link the capacity of the countryside and the needs of the cities — must be similarly protected. Implementing good farm policy is critical to this objective, because sustainable food policy is inimical to sustainable ecosystems, sustainable economies, and sustainable communities. In our quest for food security and sustainability, Canada badly needs role models. In this context, Cuba offers some unique lessons.

Learning Outcomes:

After taking this course, students will be able to:

1. Explain the structure of Cuba's agriculture sector.
2. Describe the 5 key factors behind Cuba's rapid transition to sustainable agriculture: (strong scientific capacity, farmer literacy, solid agricultural extension, large cooperatives, and good soils, water and climate).
3. Articulate the structural changes and institutional framework that supported the transition.
4. Communicate and discuss Cuba's widespread adoption of sustainable farming practices, including:

Organic fertilization and soil conservation. The use of organic and biofertilizers have allowed substitution of organic methods for chemical fertilizers to meet the

nutrient requirements of crops previously met through external inputs. The use of manure, sugarcane byproducts (cachaza), organic fertilizers, compost, bioearth, worm humus, residues from sugarcane collection centres (biomass), waste water, cover crops, mulch, biofertilizers and other materials produce higher yields and improve soil cover, dry matter content, and soil properties.

Ecological management of pests, disease and weeds Elimination of pesticide use is one of the most difficult tasks in a conversion to organic farming practices. The research into bio-pesticides developed by the Cuban Ministry of Agriculture's National Plant Protection Institute (INISAV) is made available to farmers through the creation of a national network of 280 Centres for the Production of Entomophages and Entomopathogens (CREEs) which manufacture and distribute biocontrol agents suited to local crops and conditions. CREEs are positioned according to local needs and have work teams comprised of university-educated specialists, lab technicians and auxiliary staff. The products are sold directly to area farmers, reducing transport and storage needs. Production is highly diversified and specialized by region.

Livestock Management The loss of imported feed grains at the beginning of Cuba's Special Period resulted in sharp production cutbacks in Cuba's livestock production sector. Strong advances in crop rotation and polyculture have been employed to improve soil coverage and quality, control harmful pests and diseases and increase production. Successful use of legume-based livestock systems, silvo-pastoral and integrated crop-livestock systems have resulted in significant and sustainable increases in dietary protein. Bio-controls are used to treat mites and other insect pests.

Crop Management Presently, one million hectares (20% of Cuba's total farmland) are protected by the application of biological controls. Much of this land is in vegetable, tropical vegetable and fruit production. Most of Cuba's 32,000 hectares of citrus and tree fruits are managed organically. Organic production methods are being tested in sugar and coffee (4,500 hectares), cocoa, coconut, pineapple and mango production. Crop rotations are used to reduce soil pathogens. Intercropping and the use of crop associations are widely used to keep pest populations low and to reduce disease and weeds; common are corn-bean and cassava-bean associations but more complex planting such as corn-squash-sweet potato-beans-cucumbers are also common. Integrated pest management programs are in place for 27 crops, controlling a total of 74 insect and mite pests and several fungal diseases.

Ecological Soil Management Organic techniques such as the use of living barriers, ground cover with locally adapted pasture species, contour plowing and conservation tillage systems are used to manage, conserve and recover compacted, salinized, eroded and otherwise degraded soils.

Urban Agriculture In the early 1990's, in response to food and petroleum shortages, Cuba made a major commitment to the production of food in cities, or urban agriculture. Today, organoponicos (raised bed organic vegetable production), intensive vegetable gardens, backyard and roof gardens, small (2-15 hectare) suburban farms and the self-consumption gardens of large enterprises, institutions and government offices together contribute an estimated 90 percent of the fresh produce consumed in Havana. The production goal for Cuba's urban agriculture sector is 1.4 million metric tons per year to meet the national nutritional goal of 300 grams of fresh vegetables per person per day. Key issues in the development of urban agriculture are conservation and management of soil fertility and integrated pest and disease management. Cuba is investigating the introduction of rabbits in urban agriculture models.

Green Medicines In 1992, organized production of medicinal plants began in Cuba. Today, there are 13 provincial farms and 136 municipal farms producing organic green medicines on 700 hectares of land. Cuba's current annual production of medicinal plants and of herbs and plants used for dyes is 1,000 tons and growing.

5. The accomplishments (successes) Cuba has achieved in the past decade.
6. The relevance of Cuba's experience to Canadian farm policy issues.

Course Outline:

See attached.

Course organization and delivery:

Three week, fully escorted tour of Cuba's farms, research stations, agricultural colleges, processing facilities, biological control centres and urban agriculture,

Evaluation:

Based on course notebooks.

Library:

Sustainable Agriculture and Resistance, Transforming Food Production in Cuba, 2002, Institute for Food and Development Policy, USA. Translated from original Spanish Transformando el Campo Cubano: Avances de la Agricultura Sostenible, Asociacion Cubana de Tecnicos Agricolas y Forestales (ACTAF), 2001

Holm, Wendy R. DISCUSSION PAPER ON SUSTAINABLE AGRICULTURE IN CUBA (LESSONS FOR CANADA), Université du Québec à Montréal APRIL 1, 2004