

# Introduction to Sustainable Agriculture

Dr Elaine Soloway

3 academic hours, 3 credits

## Course description

The course offers an overview of approaches to sustainable agriculture. In this course sustainable agriculture is compared to conventional agriculture and environmental impacts are discussed. Subjects include crop diversity, smart breeding, permaculture, bio-intensive agriculture, large scale organics, watersaving techniques, IPM and restoration ecology.

Students complete essay questions in an open book exam, complete a project of their choosing, take one field trip, and visit and evaluate crops in the experimental fields at Kibbutz Ketura.

Each week lectures will be composed of two sessions of one and a half hour lessons. The course description below describes the two sessions of each week.

## Text Book

*Small Steps Towards Abundance, Crops for A More Sustainable Agriculture* by Elaine Soloway.

## Grade components:

- Final exam 40%
- Mid-term exam 10%
- Biodiversity project 25%
- Quizzes, exercises, discussions 25%

## Course schedule and reading:

Section One: The Foodweb In Danger.

### Lecture 1:

**Problems of monocultural cropping systems.**

**The other lives involved in food production.**

Lecturer: Dr Elaine Soloway.

Readings:

Introduction and chapter one of the textbook.

*Betting the Farm* and *Billion Dollar Corn* from *The Last Harvest* by Paul Raeburn.

Handout: Green Revolution by Sharon Astyck.

### **Lecture Two :**

**Agriculture and water.**

**Agricultural format and its influence on the rural landscape.**

Lecturer : Dr Elaine Solowey.

Readings:

Chapter two of textbook.

*The Desert Farming Experience from Mirage* by Russel Clemings.

*Margins* by Wendell Berry from *The Unsettling of America*.

### **Lecture Three:**

**Comparing conventional agriculture and sustainable agriculture in commercial format.**

**Comparing conventional and sustainable systems by total harvest index.**

Lecturer : Dr Elaine Solowey

Readings:

Chapter three of text.

Wes Jackson/ *Prarie Restoration*-- explanation and overview.

Handout: The Ecology of Colony Collapse Disorder.

### **Lecture Four:**

**Part 1: "Wild plants and Biodiversity"** ( Guest lecturer)

**Part 2: The crucial importance of in-crop diversity to agriculture.**

Lecturer : Dr Elaine Solowey.

Readings:

Chapter four of textbook.

*Seeds Imbued With Wildness* by Gary Nabhan from *Enduring Seeds*.

*Hijacking the Future* by Vandana Shiva from *Stolen Harvest*.

### Section 2 Investing Agricultural Resources

**Lecture Five: The inexpert science of plant breeding.**

**Where do crop plants come from? The lessons of domestication.**

Lecturer : Dr Elaine Solowey.

Readings:

Chapter five of textbook.

*As Alike as Identical Twins* by Paul Raeburn from *The Last Harvest*.

*The Value of Biodiversity* from *Shattering* by Mooney and Fowler.

### **Lecture Six:**

**Crop protective chemicals and their problems.**

**The problems of chemical fertilizers.**

Lecturer : Dr Elaine Solowey.

Readings:

Chapter six of textbook.

*The Causes of Desertification* from *The Threatening Desert* by Alan Granger.

Handout: The Bees Come Back in Southern France.

**Lecture Seven:**

**Desert permaculture.** (Guest lecturer)

**Permaculture and the rural landscape.**

Lecturer : Dr Elaine Solowey

Readings:

Chapter seven and eight of textbook.

Bill Mollison/ *Permaculture*-- explanation and overview.

Handout: Michael Pollan on Slow Food.

**Week Eight:**

**Field trip to Kibbutz Lotan.**

**Colony Collapse disorder and domestic honeybees.**

Lecturer : Dr Elaine Solowey.

Readings:

Chapter nine and ten of textbook..

*A Vision for the Future* from *Mirage* by Russel Clemmings.

Chapter 1-3 *A Spring Without Bees*.

Handout: Into the Future. Agriculture and Pollinating Insects.

Section 3 Wise Agriculture

**Lecture Nine:**

**Biomimicry in Agricultural formats.**

**Biometrics in plant breeding.**

Lecturer : Dr Elaine Solowey.

Readings:

Chapter ten and eleven of textbook.

*Biomimicry*-explanation and overview.

Essay, local examples of biomimicry.

**Lecture Ten:**

**Domestication protocols.**

**New crops and climate change.**

Lecturer : Dr Elaine Solowey.

Readings:

Chapter twelve and thirteen of textbook.

*Biometrics and Pedigreed Breeding* from *Return to Resistance* by Raoul Robinson.

**Lecture Eleven:**

**Integrated agriculture.**

**Smart breeding.**

Lecturer : Dr Elaine Solowey

Readings

*Wise Agriculture* from textbook.

*Afterword* from textbook.

*Towards a Perennial Agriculture* by E. M. Solowey.

**Lecture Twelve:**

**Presentations and projects.**

Each student will complete an approved project for this class.

Lecturer : Dr Elaine Solowey.

**Recommended Reading List**

Additional reading will be supplied from works by Vandana Shiva, Paul Raeburn, Gary Nabhan, Russel Clemings, Wendell Berry and Wes Jackson.