

Online Course

Fertilization and Irrigation

Strategies and Best Practices


<https://cropaia.com/fertilization-and-irrigation-online-course/>



General Information

Course code:	FIMAR19
Course name:	Fertilization and Irrigation - Strategies and Best Practices
Languate:	English
Delivery method:	Online course: Access to course recordings
Level and prerequisites:	Intermediate
Certificate	Certificate of completion

Instructor

	Guy Sela
Accreditations and bio:	<p>Mr. Sela is an international expert in plant nutrition and water management.</p> <p>Founder of Cropaia Founder and former CEO of SMART! Fertilizer Management</p> <p>BS.c Water and Soil Cicences, Hebrew University of Jerusalem Chemical Engineering, Shenkar College, Israel</p>
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Description and Objectives

The course "Fertilization and irrigation – Strategies and best practices" consists of 10 online sessions, between 1.5 and 2 hours each.

By completing the course, you will understand the essentials of fertilization and irrigation, you will be able to design fertilization plans and irrigation regimes. You will know the practices and theory of fertigation, drip irrigation and other important practices.

Course outcomes:

- Acquire knowledge of the essential plant nutrients
- Understand the processes in soils that influence the availability of the different nutrients
- Understand irrigation water quality and develop skills in interpreting water analysis
- Understand soil salinity, how it affects crop production and how to avoid it
- Develop skills in interpreting soil test results
- Learn how to design fertilizer programs based on soil, water and plant tissue analysis
- Develop skills in fertigation and understand the interactions between fertilizers, water and soil
- Acquire knowledge of water requirements by crops
- Understand water in soil and its availability for plants
- Develop skills in irrigation scheduling and designing irrigation systems

Topic 1: Plant nutrients

Yield response to nutrients

Law of minimum

The essential nutrients

 The macro nutrients

 Secondary nutrients

 Micronutrients

Nutrient availability

Nutrient forms

Unit and form conversions

Nutrient requirements by crops (effects – planting density, weather, Crop phenology and nutrient uptake curves, target yield)

Nutrient deficiencies and their symptoms

Topic 2: Soil as a source of nutrients

Soil properties

Soil minerals

Soil pH

The organic matter

Nutrients in soil

Availability of nutrients in soil

Soil nutrient holding capacity (Cation exchange capacity)

Soil texture and how it affects nutrient availability

Soil biology and its effect on nutrient availability

Harmful minerals

Topic 3: The water – sources, properties and quality

Water sources for irrigation:

Ground water

Surface water

Wastewater

Desalinated water

Measurement units – ppm, mmol/l, meq/l

Water quality for irrigation – chemical, physical and biological properties

Water quality chemical parameters

Alkalinity and Carbonate hardness

Hardness

pH

TDS

The electrical Conductivity

Nutrients occurring naturally in water

Harmful elements and their allowed ranges

Interpreting water analysis

Topic 4: Salinity – soil and water

What is salinity

Sources of salts in soil and water

Effect of salinity on plants and crop yields

Salinity symptoms in plants

Effect of salinity on soil

Salinity parameters in soil and water – EC, SAR,

Measuring soil salinity

Salinity thresholds

Toxicity of specific elements

How to avoid or minimize soil salinity

Item 5: Interpretation of soil, water and plant tissue analysis

The soil solution

Nutrients in the solid soil phase

Extraction methods

Soil salinity and fertility

How to interpret soil analyses

Interpretation of additional parameters: Cationic exchange capacity (CIC), organic matter, soil pH, soil electrical conductivity

Additional approaches to interpreting soil analysis results

Saturation of basic cations

Quantitative analysis

Interpretation of water analysis

Interpretation of plant tissue analysis

Topic 6: The Fertilization Plan

The target yield

Nutrient requirements as determined by target yield

Philosophies for balancing soils

How to adjust the nutrient requirements based on soil, water and tissue analysis

Types of fertilizers

Organic fertilizers

Choosing fertilizers

Calculating fertilizer rates

Timing of fertilizer application

Basal application

Split applications

Methods of fertilizer application

Topic 7 - Fertigation

Advantages and challenges

Quantitative fertigation

Proportional fertigation

The nutrient solution

Effect of the water quality

Preparation of stock solutions

Fertilizer solubility and compatibility

Calculations

Fertilizer injectors

Fertigation systems

Topic 8: The water in soil

Soil porosity and texture

Types of soil water

Water holding capacity of the soil

Water storage in soil

Moisture conditions of the soil

The osmotic effect

Movement of water in the soil

Item 9 - Irrigation management

Water requirements of plants

The Evapotranspiration

Methods for estimating evapotranspiration

Irrigation scheduling based on crop evapotranspiration

Leaching

Irrigation scheduling using tensiometers

Irrigation scheduling using sensors

Irrigation methods

Drip irrigation

Sprinklers

Session 10 - Exercise

We'll do a live exercise and answer your questions