Basics of Soilless Crop Production Systems

Petrus Langenhoven, Ph.D.
Horticulture and Hydroponics Crops Specialist
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OUTLINE OF PRESENTATION

• Soilless Production
• Solution Culture
• Medium Culture
• Crops
STATISTICS

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Soilless Production

..method of growing plants using mineral nutrient solutions, without soil...

Two types of hydroponics, solution culture and medium culture
RECORD TOMATO YIELD....2014/15 SEASON, Bleiswijk, The Netherlands

*Dutch start third trial on tomatoes with 100% LED-lighting: 100.6 Kg/m2 at the Improvement Centre in Bleiswijk. What's next?*

2014/15 season

100.6 kg m\(^{-2}\) = 20.6 lb ft\(^{-2}\)

or

1006 ton ha\(^{-1}\) = 449 US tons acre\(^{-1}\)

or

1006 ton ha\(^{-1}\) = 897,352 lbs acre\(^{-1}\)

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NUTRIENT FILM TECHNIQUE, fixed channel

Photo: CROPTING

NUTRIENT FILM TECHNIQUE, mobile channel system

Watch video, MGS by Hortiplan
www.hortamericas.com

Photos courtesy of Karlovec Media Group
Facility of Great Lakes Growers, Burton, Ohio
INDOOR VERTICAL FARMS, growing with sole-source LED’s

Photos: Green Sense Farms

Photos: Freight Farms

Photos: Freight Farms

Photos: Freight Farms

DEEP WATER CULTURE (DEEP FLOW), vegetable seedling production

Without seedling trays

With seedling trays

Photos: Petrus Langenhoven
AEROPONICS, recirculating cultivation system

Roots are continuously or discontinuously kept in an environment saturated with a mist or aerosol of nutrient solution

Anthurium flower production

Potato seed production

5-10 times more seed than potted systems, International Potato Center (CIP)

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Medium Culture

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GRAVEL FLOW TECHNIQUE, home gardener version

Photos: Petrus Langenhoven

EBB AND FLOW, recirculating cultivation system

© Copyright, Pure Hydroponics Ltd, 2009, www.purehydroponics.com

Photo: Petrus Langenhoven
EBB AND FLOW, recirculating cultivation system

RUN TO WASTE

Container with substrate irrigated individually

Trough with substrate with drip irrigation
RECIRCULATING, soil grown (Belgium)

Photos: Petrus Langenhoven

RECIRCULATING, Rockwool slabs with 4 plants per slab

Photos: Petrus Langenhoven
Crops

Hand-picked, soil-grown herbs...and herbs grown in soilless substrate. Potted living herbs grown in soilless substrate.

PRODUCTION OF ALTERNATIVE HIGH VALUE PRODUCTS (examples of baby squash)

Photos: Petrus Langenhoven
MELONS – Vertically trellised in a high tunnel or greenhouse

Photos: Petrus Langenhoven

INFORMATION RESOURCES

• University resources – Extension publications
• Professional magazines
• Books
  – Greenhouse Technology and management, Nicolas Castilla
  – Greenhouse Operation and Management, Paul V. Nelson
  – Soilless Culture, Michael Raviv & J. Heinrich Leith
  – Growing Media for Ornamental Plants and Turf, Kevin Handreck & Niel Black
  – Plant Nutrition of Greenhouse Crops, Cees Sonneveld & Wim Voogt
  – Hydroponic Food Production, Howard M. Resh
• Trade shows and conferences
  – Indiana Small Farm Conference, March 2-4, 2017 – Danville IN
  – Indoor Ag Con, May 3-4, 2017 – Las Vegas NV
  – Cultivate’17, July 15-18, 2017 – Columbus OH
• Manufacturers and distributors (list is not complete but it’s a good start):
THANK YOU Questions?

Contact details:

Dr. Petrus Langenhoven
Horticulture and Hydroponics Crop Specialist
Department of Horticulture and Landscape Architecture
Purdue University
Tel. no. 765-496-7955
Email: plangenh@purdue.edu