



| Wageningen University | | Sustainable Food Security: Crop Production (PPS-51802) | | |
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| Course description | You will learn about the principles of production ecology and the application of these principles to both crops and animal production. | | | |
| Domain | Food Security | | | |
| Keywords | Global food production | Food crops | yields | Regional differences |
| Prerequisites | Undergraduate basic biology | | | |
| Level | Bachelor 3, master | | | |
| Language | English | | | |
| Number of credits and workload | 2 credits | 6-8 hrs per week | 56 hrs in total | |
| Semester period and Start date course | Semester 2 | Start date: start date. Not applicable | | |
| Application deadline | 1-Apr-19 | | | |
| Full course description | <p>Week 1: we are setting the scene for the global food situation today and projected demand and supply options tomorrow. Covering the four pillars of global food systems, we will zoom in on availability issues, and more in particular on crop production, as central theme of this course. Photosynthesis plays a key role in this process, turning solar light into food, which fuels mankind.</p> <p>Week 2: Potential production is the simplest representation of crop growth, defined by the crop's genetic potential and the ambient growth factors radiation, temperature and carbon dioxide concentration in the air. Under perfect crop management, with no limitation of water and nutrients, and a weed, pathogen and pest free environment, crops reach their potential production. This week focuses on the conversion of carbon dioxide into plant biomass as powered by solar radiation, with temperature as modifying factor. Based on variation in solar radiation and temperature around the globe, you'll be able to calculate potential crop yields for different locations.</p> <p>Week 3: In the process of fixing carbon dioxide from the air into biomass, crops inevitably lose water by transpiration. When transpired water from the leaf surface is not adequately replenished through water uptake by the roots, crop production becomes water-limited, resulting in lower yields. Accounting for the evaporative demand of the air and water availability to the crop, water-limited production can be</p> | | | |

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| | <p>assessed. Conversely, to reach potential yield, you may determine the amount of water required through irrigation, as a yield increasing measure.</p> <p>Week 4: In addition to water, nutrients are essential to crop production to support physiological processes, like photosynthesis. Various nutrients are absorbed from the soil by the roots. When nutrient availability falls short, production becomes nutrient-limited. In that situation nutrient application by manure or artificial fertilizers is a yield increasing measure.</p> <p>Week 5: Actual crop production refers a situation where production is further reduced by effects of weed, pests (insects, mites, nematodes, rodents, and birds), diseases (fungi, bacteria, viruses) and/or pollutants. This introduces an extra level of complexity in plant production. In spite of intensive crop protection measures in some parts of the world, the actual production is the common production situation for the majority of the world's agricultural production systems. We will look at how weeds, and pests and diseases affect crop yields and what measures can be taken to prevent losses.</p> <p>Week 6: Synthesis Having tackled the three distinguished production situations separately in the previous weeks, we now complete the diagram reflecting the 'principles of production ecology'. Hopefully, it means more to you now and you can use it in analysing the impact of genetics, environment and management on crop yields, as will be discussed in this synopsis.</p> | | |
| Platform and link to course description | edX | https://www.edx.org/course/food-security-sustainability-crop-wageningenx-fsccpx | |
| Course description in study guide | https://ssc.wur.nl/Handbook/Course/PPS-51802 | | |
| Lecturer(s) | Ken Giller, Gerrie van der Ven, Harrie Lovenstein | | |
| Extra Course information | Wageningen online courses are fully self-paced and no lecturer is involved. Students must be able to manage their study process independently | | |
| Picture of course |  | | |
| Final examination date and time /period | tbd | tbd | July/Aug 2019 |
| Examination registration deadline or drop-out deadline | <p>Examination registration to be announced ~ June/July 2019</p> <p>Remarks on examination registration date</p> <p>Drop- out deadline If applicable, enter last drop-out date.</p> <p>Not applicable</p> | | |

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| Type of examination | Written examination on campus | |
| Midterm examination? | <input type="checkbox"/> yes <input checked="" type="checkbox"/> no | Additional information on midterm exam |
| Previous exam papers available | <input type="checkbox"/> yes <input checked="" type="checkbox"/> no | |
| Specific rules for examinations | Give details if particular rules apply like no use of calculator, watches etc | |
| Resit? and date | <input checked="" type="checkbox"/> yes <input type="checkbox"/> no | Enter resit date. February 2020 |
| Grade release and transcript release | 31-Aug-19 | Transcript release date if more than 1 week after grade release. |

| Available Places 50 | | |
|----------------------------|------------------------------|--|
| | Interested | (Maximum) places per university <i>(give details if applicable, otherwise each participating university gets an equal part of the available places)</i> |
| Adelaide | <input type="checkbox"/> yes | Click or tap here to enter number |
| ANU | <input type="checkbox"/> yes | Click or tap here to enter number |
| EPFL | <input type="checkbox"/> yes | Click or tap here to enter number |
| HKUST | <input type="checkbox"/> yes | Click or tap here to enter number |
| Leiden | <input type="checkbox"/> yes | Click or tap here to enter number |
| Rice | <input type="checkbox"/> yes | Click or tap here to enter number |
| TU Delft | <input type="checkbox"/> yes | Click or tap here to enter number |
| UQ | <input type="checkbox"/> yes | Click or tap here to enter number |
| Wageningen | <input type="checkbox"/> yes | Click or tap here to enter number |