**STATION FÉDÉRALE DE RECHERCHES EN PRODUCTION VEGETALE DE CHANGINS**
STAZIONE FEDERALE DI RICERCHE PER LA PRODUZIONE VEGETALE
EIDGENÖSSISCHE FORSCHUNGANSTALT FÜR PFLANZENBAU
SWISS FEDERAL RESEARCH STATION FOR PLANT PRODUCTION
**Centre d'arboriculture et d'horticulture des Fougères, CH - 1964 Conthey**

☎ centrale: 027 345.35.11
Fax : 027 346.30.17
✉ RAC Centre des Fougères
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# HORTICULTURE: RESEARCH AIMS AND TOOLS

## Greenhouses (engineering)

**Excess diurnal solar heat may be stored to reach about 20% energy savings on yearly average. Two storage systems (water tank or diffusive through buried pipes), have proved efficient and are still operating in two greenhouses. Further developments are needed to optimize exchanger aeraulics, warm air distribution design and control strategies (contact: Antoine Reist).**

## Biological pest control

**Strategies are continuously being worked out to avoid pesticide applications. Noticeable progress has been achieved with the keeping of auxiliaries feeding on non-invasive baits (e.g. on aphids specific to gramineae) or directly on plants they can feed on (e.g. Macrolophus on Nicotiana)(Contact: Serge Fischer).**

## Plant nutrition

**Irrigation schedules and fertilizer applications are driven with the help of soil analysis, so as to reduce the risk of downstream losses.**
**Soilless cropping moves from rockwool to organic substrates, following repeated proof of liability. Closed loops of fertigation proved safe (less danger of diseases thanks to better control of root environment), ecologically sound (avoiding any loss of chemically loaded water) and economically favourable for yearround crops (Contact: Dominique Pivot).**

## Testing cultivars (new accessions or unusual species) and cropping techniques

**Systematic evaluation of new cultivars (including rootstocks for fruit crops) is performed for the main crops, to provide information on vigour, sensivity to pests and diseases, and market acceptance. Various cropping schedules and techniques are being tested with the scope of optimizing the management of resources such as energy, water, fertilizers (Contact: André Granges).**

## Assessing fruit quality

**Anticipating the increasing demand for high quality in fruits and vegetables, we are since many years tracking various analytical indicators to build up a comprehensive and practical quality index (Contact: André Granges).**

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# FRUIT CROPS: RESEARCH AIMS AND TOOLS

## Breeding and testing cultivars

**New accessions of apples and european pears have been launched recently, and work is still going on with apricots also. New cultivars are expected to be fertile, vigourous, locally adapted and resistant or tolerant to common pests and diseases; fruits should be attractive, palatable, nutritionnally valuable and well adapted to cold preservation and transport**
**World wide accessions are being tested to inform local growers, traders and consumers about the quality of fruits and the best orchard management techniques (contact: Charly Rapillard).**

## Defining appropriate soil management practices

**Orchards are an important part of landscape and they play a critical role in the preservation of a diversified wildlife. Various soil and vegetation management practices are under test, to assess their effect on biodiversity and possible influence on biological pest control (Contact: Werner Pfammatter).**

## Optimizing training and pruning methods

**Various shapes and training methods provide adapted responses to the diverse species, cultivars and cropping systems. Detailed analysis of photosynthetic efficience of various shapes and training systems are systematically being performed (contact: Philippe Monney).**

## Optimizing harvest time and fruit preservation

**Biological processes such as transformation of starch to sugars are good indicators of fruit maturity, which has to be optimal at time of harvest. Time-harvested fruits show and keep the best quality. Temperatures and gas mixtures in storage chambers are adapted to the specific needs of various species, cultivars and duration of storage.**
**Analytical tests are being developed and tested along with tasting by trained tasters to assess the actual quality of fruits (contact: Jean-Pierre Siegrist).**

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