

PILLAR 4 QUALITY, SAFETY AND SUSTAINABILITY: IMPROVED POST HARVEST CHAIN MANAGEMENT.

The objectives of this Pillar are achieved by 2 work packages:

WP4.1 - Safer fruit and environment by replacing pesticide treatment against post-harvest rot (*NON-CHEMFRUIT*).

WP 4.2 - Control of fruit quality from harvest to point of sale (*OPTIMALQUALITY*).

NON-CHEMFRUIT aims to provide sustainable alternatives to the use of pesticides for the prevention of post-harvest losses of fruit due to rot. In this way pesticide load to the environment is considerably reduced and fruits free of chemical residue, that are safe to eat with their skin, will be available for consumers. To achieve this goal the combination of several non-pesticide techniques (hurdle approach), such as hot water, biological control agents, GRAS (*generally recognized as safe*) treatments mainly with natural substances, and (especially in apples) the application of ozone and/or UV in the storage room will be investigated. By combining this with the results of 'selective picking' (i.e. avoiding low positioned fruit in the stored fruit) the results can be further improved. Given the diversity of the rot agents affecting the various fruit species; apple and peach, representing the most important fruit crop in northern and southern Europe, will be chosen as models. For each fruit the trials will be conducted in two European regions: The Netherland and UK for apples and Italy and Spain for peaches. According to the prevailing pathogens and their site of infection, various strategies will be planned and tested by combining in different ways the mentioned means. In apples the integration phase can start in the first experimental season except for new varieties where hot water sensitivity has to be assessed first. In peach and nectarines, during the first 9 months the tolerance to hot water treatments of varieties, particularly the new ones will be assessed, given the limited data available in the literature for these species. In the same period of time the biological control agents registered for use or in the pipe-line (produced by UNI.BO, IRTA and U.GEM) will be exchanged among the partners and if needed, some preliminary test will be done. The natural substances needed for GRAS treatment will be collected or extracted and shared among the participants. Following this preliminary phase the above mentioned treatments, will be combined for the control of the relevant pathogens of apples and peaches. On each fruit species and related pathogens, the compatibility of the selected control methods and their efficacy will be tested in various cultivars (early, mid and late) and during storage and distribution.

Later, the most successful combinations will be developed and tested by all the participants in their regions. In the last experimental season an evaluation at commercial level in packing houses will be conducted in The Netherland for apples and in Italy for peaches.

The overall objective of ***OPTIMALQUALITY*** is to achieve a better fruit quality chain management in consumer driven apple and peach chains. To attain this, a prototype of a decision support system (DSS) for fruit quality chain management and a prototype device for multi non-destructive quality assessment will be developed. This requires a multi-disciplinary approach of the necessary activities. The major challenge of ***OPTIMALQUALITY*** is to incorporate existing and new technological, scientific and practical knowledge into parameters and calculation rules for DSS decision making and to design equipment for non-destructive quality assessment. The WP is organized in 4 tasks. During the first 18 months a description of a DSS design will be made (task 1),

characteristics and calculation rules for DSS decision making deduced from existing data bases on fruit quality management (task 1), a concept multi-sensor device for non-destructive quality assessment worked out and tested (task 2) and new experiments carried out to determine missing data on fruit quality management (Tasks 1 and 3). Seven (intermediate) deliverables are defined for the period 0-18 months.

At the start of the project task leaders will be appointed by the WP-leader to whom they should report the progress of their work according to a scheme set up at the kick off meeting of pillar 4. When activities cannot be carried out or when a scheduled plan is not achieved, then the pillar coordinator and WP-leader will look for alternatives which can be carried out within time and budget of the WP. Starting point for this is that the deliverables will be delivered. When no alternatives are available the pillar co-ordinator will contact the overall project co-ordinator to decide upon other steps.

The Pillar co-ordinator is assisted by the WP leaders. Meetings are foreseen at pillar and work package level. During pillar meetings, the Pillar co-ordinator will be keen of the respective information from the other WPs. WP leaders will also inquire about the results they got in the other WPs from other Pillars in order to maintain and develop the complementarities of the WPs and to fulfil the Milestones and the Deliverables in due time. During the WP meetings, the WP leader will promote the exchange of knowledge and will take care of organizational aspects. The pillar coordinator and WP leaders check that the research teams can fulfil the scheduled plan per task and will decide upon the appropriate procedures in case of problems hampering the planned research.