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ILLIAD project: Sustainable, local or localised, innovative food chains – application to apricot production

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ILLIAD (a French national project, 2012-2015) proposes a method to analyze the system sustainability of food chains. The sustainability of food systems has been defined in terms of their effects on environment, economics and society, until now. ILLIAD aims to propose a method that allow to take into account the ability of these food systems to perdure or develop, in the long run, and aims to access their ability to increase their positive effects on environment, economics and society.

Methodology to analyze the systemic sustainability of the food chain

Four practical cases describing the three typical trajectories (Figure 1):

- the chain innovation / creation of a new chain (peach and apricot) (Figure 2)
- the chain differentiation / development of distinctive products (rice and spelt)
- the territorial embedding / strengthening interlinkages between economic activities (wheat and equestrian centers).

	Food chains subject			
	Apricots	Peaches	Bread Wheat	Rice
Context	<ul style="list-style-type: none"> Consumers and governments request more sustainable food chains : environmental (less pesticide, moderate use of water), economical (to resist to a crisis and to ensure prices), social (alternative food system like CSA). Today, Nothing permits to evaluate the sustainability of each food chain 			
	<ul style="list-style-type: none"> Loss share of market Marketing and production are not really organized Strong competition in EU 	<ul style="list-style-type: none"> Fluctuating price Weakness of yield Problem of nitrogen nutrition 	<ul style="list-style-type: none"> Strong demand for a quality rice (nutrition, taste and health) same problem between local rice food chain and Epeautre 	
	<ul style="list-style-type: none"> fruit processors rely on the surplus fruits from fresh consumption 	<ul style="list-style-type: none"> At least 22 yearly treatments 	<ul style="list-style-type: none"> High cost for organic manure (turb from cattle/horses food chains) 	
Scope of the project	<ul style="list-style-type: none"> Creating a new alternative local and sustainable food chain (definition, indicators, technical and organizational) → theoretical model applied for each food chain 			
	<ul style="list-style-type: none"> Development of alternative marketing channels, as catering, out-of-home dining, direct sales from producers to consumers of other areas 	<ul style="list-style-type: none"> Horizontal relationship between wheat and cattle food chains to increase value (for turb and fodder) 	<ul style="list-style-type: none"> study short and long marketing channel study criteria of success of Epeautre area for rice food chain 	
	<ul style="list-style-type: none"> Creation of a specific chain dedicated to processing 	<ul style="list-style-type: none"> Development of low-input or organic practices 		
Partner for each Work	UMR MOISA			
	UMR SQPOV U GAFL IAMM	IAMM UE Gotheron UMR SQPOV	ITAB	CIRAD
Subcontractor	SICA CENTREX CA Drôme SEFRA	SICA CENTREX CA Drôme Efficient Innovation	CIVAM	
Geographical Area	Languedoc Roussillon / Rhône Valley	Languedoc Roussillon / Rhône Valley	Languedoc Roussillon / Rhône Valley	Haute Provence Camargue Vietnam

Figure 1: Food chains studied in the ILLIAD project

The expected results for apricot chain could be of great interest in defining both fresh and processed fruit ideotypes. One hindrance for development of orchards dedicated to processing is the high cost of manpower. So, our project includes the experimental analysis of mechanical harvest of orchards (see poster Gouble et al.).

Apricot chain: system sustainability

- Definition and building of indicators (bibliography)
- Understanding relationship between producer and consumer (experiments)
- Evaluation of barriers to sustainable food chain development

sub-task 1 : apricot sustainable food chain

- Analysis of existing apricot food chains (// peach)
- Proposition of new alternative marketing channels (// peach)
- Design of the apricot processing chain

sub-task 2 : Identification of apricot lines suitable for processing

- Identification of the relevant quality traits in apricot (texture, composition).
- Relationship between texture of fresh and processed fruit (Figure 3) / identification of physical, chemical, physiological and genetic factors related to this trait.

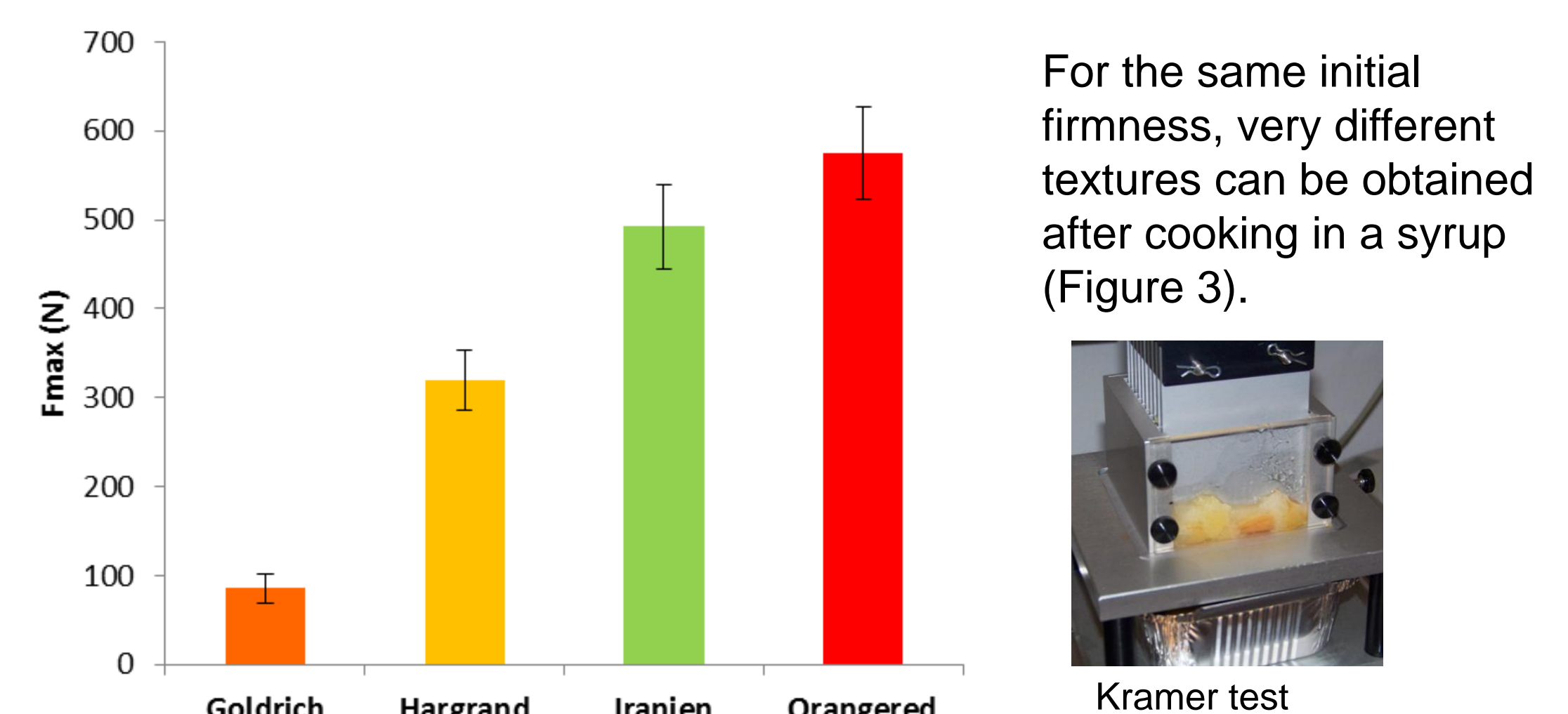


Figure 3: Firmness (Fmax in Newton) of processed halved apricots crushed with Kramer cell. Apricot halves were cooked in a syrup until 80°C in core. Means +/- SD of 3 measurements).

sub-task 3 : technical constraints of an orchard adapted to processing

- Selection of apricot varieties according to fruit texture (mechanical stress), tree architecture (upright tree), fruit maturity (homogeneity) and agronomic traits (productivity).
- Orchard management according to harvesting machine: distance between trees, trunk eight, width of aisles and irrigation system.

A new sustainable apricot food chain

- Tests in new orchards: harvest and quality evaluation
- Apricot processing at pilot scale
- Acceptability of apricot by consumers

Tests/validations

Figure 2: Focus on apricot chain

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