Questionnaire for Mechanized Collection Prunings

Field data (Each questionnaire refers to one crop species cultivated per field)

Municipality : Palenciana

Latitude : 37.245978

Longitude : -4.651702

Field Size (ha)   8.61

Crop Species

- [x] olives
- [ ] vineyards
- [ ] apples
- [ ] pears
- [ ] peaches
- [ ] apricot
- [ ] nectarine
- [ ] plum
- [ ] cherries
- [ ] oranges
- [ ] tangerines
- [ ] lemons
- [ ] grapefruit
- [ ] hazelnuts
- [ ] chestnuts
- [ ] almonds

Variety of crop

Age of crop

Density of crop (trees/ha)

Width between cultivated rows (m)

Distance between trees (m)

Crop form

Crop forms for vineyard

☐ Vase ☐ Espalier ☐ Marquee

Crop forms for Olive

☐ Ancient olives ☐ Vase (1 stem) ☐ Vase (2-3 stems from soil) ☐ Bush (intensive 250-600 trees/ha)

☐ Superintensive (>1500 trees/ha)

Crop forms for fruit trees

☐ Natural ☐ Vase ☐ Bush/Globe (very small trees) ☐ Spindle/Pyramid

☐ Palm/Fan ☐ Epsylon transversal

Slope (%)   5

Soil Cover

☐ Bare.No grass cover. Tillage several times per year

☐ Seasonal occurence. Herbicides+mowing <50% soil cover

☐ >50% grass cover. Mowed several times per year

☐ 100% Grass cover. Mowed several times per year

Crop Yield

Average Crop yield (t/ha)   _____

Crop yield before measurement (t/ha)   _____
Ammount of product obtained for the year that the pruning measurement is perfomed in tonnes per hectare

Irrigation   ☐ rain fed   ☐ partial irrigation   ☐ fully irrigated

Intensification degree
Specify the amount of fertilizer and pesticides   ☐ organic   ☐ low   ☐ intermediate
☐ high

Pruning Operations Performed

Type of pruning

- ☐ Maintenance
- ☐ Structuring
- ☐ Removal of old branches
- ☐ Grafting
- ☐ Topping
- ☐ Blooming

Pruning Method

- ☐ Only manually
- ☐ Mechanised pre-pruning + manual
- ☐ Fully mechanised

Pruning Operations

Specify the pruning operations that are carried out. Check as many as apply.

- ☐ Manually shears

- ☐ Assisted shears

- ☐ Chainsaw/ armchainsaw

- ☐ pre-pruner:hedge trimmer

- ☐ pre-pruner:discs

- ☐ pre-pruning topping

Season of pruning

- ☐ January
- ☐ February
- ☐ March
- ☐ April
- ☐ May
- ☐ June
- ☐ July
- ☐ August
- ☐ September
- ☐ October
- ☐ November
- ☐ December

Frequency of pruning
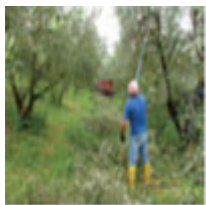
- ☐ annual
- ☐ biannual
- ☐ biennial
- ☑ Once per 4 years

Preparation of the field prior to harvesting

☐ No preparation - prunings were left on the soil as they fall from tree

☐ Centre-operatos position prunings on the center of the lane between tree rows

☐ Centre alligned-operators position prunings in a specific position in center
(e.g. alligned with the direction of the row)

☑ Previous windrowing-a tractor with windrower is used prior pruning harvester

☐ Integrated windrower to the pruning machine

Harvesting methods

Check according to the figures below the harvesting method that is used for the pruning biomass

	Manual cross-cutting of firewood+gathering at field side	☐
	Forestry chipper towed by tractor + manual feeding	☐
	Hauling the branches + shredding/chipping at field side	☐
	Hauling the branches + baling at field side	☐
	Harvest with mulcher/chipper in front	☐
	Harvest with mulcher/chipper at rear	☐
	Harvest with rear mulcher/chipper and bin	☐
	Harvest with rear mulcher/chipper and big-bags	☐
	Automotive shredder/chipper with rear trailer	☑
	Harvest with standard hay baler	☐
	Harvest with rear baler prepare for wood or tree branches	☐
	Pre-pruning integrated with collection and mulching/chipping	☐
	Pre-pruning integrated with collection and mulching/chipping in an automotive machine	☐

Type of pruning treatment and model of machinery

Specify the method that prunings are treated based on the outcome product and manufacturer-model of each machinery (windrower,mulcher,chipper,baler) that is used if applicable

☐ Windrower-Machines that allign biomass in a row

Windrower (manufacturer-model) _____

☑ Mulcher-big pieces. Machines that break the branches in big pieces. Normally they are an evolution from the typical muchers/cruchers utilised to leave the branches on the soil in pieces.

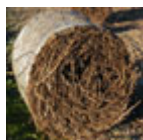Mulcher (manufacturer-model)   Valoriza Energia- Energy Agency SAT- 4

☐ Shredder - Produce finer material (hammers or hammers with a knive.Do not produce a clear cut)

Shredder (manufacturer-model) _____

☐ Chipper - Clean cut. Resembles the typical form of forest woodchips

Chipper (manufacturer-model) _____

☐ Round bale

Baler (manufacturer-model) _____

☐ Squared bale

Baler (manufacturer-model) _____

Processes Specifications

Specify the specifications of the processes (manpower,gross working time, productivity, fuel consumption)

Check as many as apply

Processes	Manpower (Nr of persons)	Gross working time (hr/ha)	Productivity (t/ha or t/hr)	Fuel consumption (l/hr)
Manual Alignment	☐			
Windrowing	☐			
Integrated harvesting/treatment	☑	0.25	2.1 t/ha	
Hauling	☐			
Treatment at field side	☐			
Disposal/dumping of biomass	☐			

End product properties

Specify the properties (moisture,bulk density,particle size,ash) of the prunings after treatment and harvesting, if known

Moisture (% a.r.)   26_____   Particle size (cm)   _____

Bulk density (kg/m3)   _____   Ash content (% dry basis)   _____

Losses of biomass after harvesting

(%) _____   or (tonnes/ha) _____

Problems encountered due to the field

☐ Soil uneven   ☐ Slope

☐ Stones   ☐ Too much grass

Problems encountered by the machines

☐ Not suitable for the pruning   ☐ Manouvering

☐ Unsuitable feeding system (biomass difficult to be conveyed)   ☐ Too much soil particles with the biomass to be treated

☐ Problems in discharge

Performance of the machinery

☐ The machinery was performing better than expected

☐ The machinery was performing normally-typical expected

☐ The machinery was underperforming

Value Chains

Indicate if your experience is based on an isolated test or if it based on an existing value chain:

☑ My experience is just an experimental trial-machinery test

☐ My experience is part of an existing value chain

Contact Data	
Name :	Raffaele Spinelli
Email :	spinelli@ivalsa.cnr.it
Phone :	+39 055 5225631
Profession :	Researcher
Country :	Spain

References-External links:Provide references on which the information is based on or highlight any comments

Harvesting losses, were not measured because it appeared to be very limited.

Raffaele Spinelli , Gianni Picchi, Industrial harvesting of olive tree pruning residue for energy biomass,Bioresource Technology Volume 101, Issue 2, January 2010, Pages 730–735