Report on collected Observatory data: Year 2

Deliverable 6.2

WP6. Observatory of pruning potential and utilization

uP_running

Take-off for sustainable supply of woody biomass from agrarian pruning and plantation removal

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ABBREVIATIONS

APPR: Agrarian Pruning and Plantation Removal

CERTH: Centre for Research and Technology Hellas

CIRCE: Research Centre for Energy Resources and Consumption

EC: European Commission

EuroPruning: Development and implementation of a new and non-existent logistics chain for biomass from pruning

uP_running: Take-off for sustainable supply of woody biomass from agrarian pruning and plantation removal

WP: Work Package

DEFINITIONS

Prime Mover	It is the pioneer who gives rise to a new biomass value chain. Other key actors might participate, but the chain would not have occurred without its initiative. Usually, it is the actor who invests and takes the largest part of the risk for the implementation of the value chain.
Observatory	The web-based, main tool that the uP_running project has developed in order to record and display "experiences" with APPR biomass such as field sampling / biomass productivity measurements, mechanized collection of APPR biomass and APPR value chains.

EXECUTIVE SUMMARY

APPR biomass is the accumulated biomass from agricultural pruning and plantation removal operations. In most cases APPR biomass is burnt in open fire or left on soil, thus being unexploited. In the uP_running project, a simple to use web tool (the "Observatory") is developed that registers and displays the APPR availability (figures in tons of biomass per hectare), the APPR collection (sites where data on harvesting performance has been obtained) and APPR success cases (value chains under exploitation). The final aim is to motivate actors to make use of APPR and replicate success APPR value chains. The aim of the current report is to present the progress of the data population on the Observatory web tool.

Till May 2018, the Observatory web tool has collected 418 experiences with APPR biomass, the majority of which refer to field measurements of biomass production from prunings. Currently, around 60 % of the experiences collected originate from literature sources or surveys conducted by the EuroPruning project (FP7-312078), but an increasing number of new experiences generated or identified by the uP_running project have been collected. The variability of the results illustrates the usefulness of the uP_running Observatory in assisting farmers and other stakeholders to assess the biomass production potential from their own fields.

The present reports intends to give an overview of the APPR experiences that are included in the Observatory. For more details on the recorded APPR experiences, please visit the Observatory webpage at: http://www.up-running-observatory.eu/en/

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INTRODUCTION

The current report constitutes **Deliverable D6.2 "Report on collected Observatory data"** of the uP_running project. The report is the result of work undergoing in **Task 6.2 "Registry of field data"** and **Task 6.3 "Registry of collection experiences and value chains"**.

The main objective of Task 6.2 is to improve the knowledge regarding the potential of APPR biomass by encouraging farmers to provide field data about the availability of such biomass resources in their own plantations.

The main objective of Task 6.3 is to improve the knowledge regarding the mechanized harvesting and utilization potential of APPR biomass by building a database for collection experiences and successful value chains.

The following data sources are utilized in order to meet the task objectives:

a) Literature data, e.g. published papers and reports. This includes results achieved and information collected through other European or national projects relevant to APPR biomass, e.g. EuroPruning.
b) Experiences directly resulting from the activities of the uP_running project, e.g. demonstrations of APPR harvesting, field measurements of APPR productivity.
c) Experiences that were not previously recorded but were identified and studied through the efforts of the uP_running project partners. This is mostly relevant for APPR value chains that were not previously studied by the EuroPruning project.

All data relevant to a specific APPR biomass experience (e.g. field measurement of potential, mechanized collection or value chain) are uploaded on the uP_running Observatory website using the standardized templates that were developed in the framework of Task 6.1 "Observatory development and creation of templates".

The main aim of Deliverable D6.2 is to facilitate the transmission of key-findings from the experiences recorded in the Observatory, e.g. through some basic statistical analysis or listing of recorded data.

This Deliverable report is prepared in English and covers experiences recorded by the uP_running Observatory from the project start (April 2016) till May 2018; it is an update of the first version of Deliverable D6.2, which covered APPR experiences collected in the Observatory till March 2017. One final update of the deliverable is foreseen at the end of the uP_running project (spring 2019).

1 PROGRESS OF POPULATING THE UP_RUNNING OBSERVATORY

The Observatory tool is a registry of APPR biomass productivity from field measurements, mechanized collection experiences and success cases of APPR value chains. It has been designed in a way that represents the data gathered through systematic questionnaires in order to help the users see and find material relevant to their own interests. Till the end of the second project year (May 2018), the number for each experience type recorded in the Observatory web tool is as follows:

- ***355*** field measurements of biomass production from prunings
- ***7*** field measurements of plantation removal biomass
- ***35*** mechanized collection experiences for prunings
- ***1*** mechanized plantation removal experience
- ***20*** APPR value chains

The Table 1 below summarizes the current status of populating the Observatory with experiences in comparison with the targets set by the uP_running project. Figure 1 compares the annual progress of the Observatory tool; it is clear that many more experiences were made available on the Observatory, mostly due to the activities of the uP_running project.

Table 1. Progress of the populating the uP_running Observatory with experiences (up to May 2018).

uP_running Observatory collected data for APPR biomass experiences			
	Biomass productivity	Collection	Value chains
Experiences collected from literature data, EuroPruning surveys, etc.	233	25	18
Experiences generated or identified by uP_running	129	11	2
Project Target (June 2019)	**300**	**50**	**20**

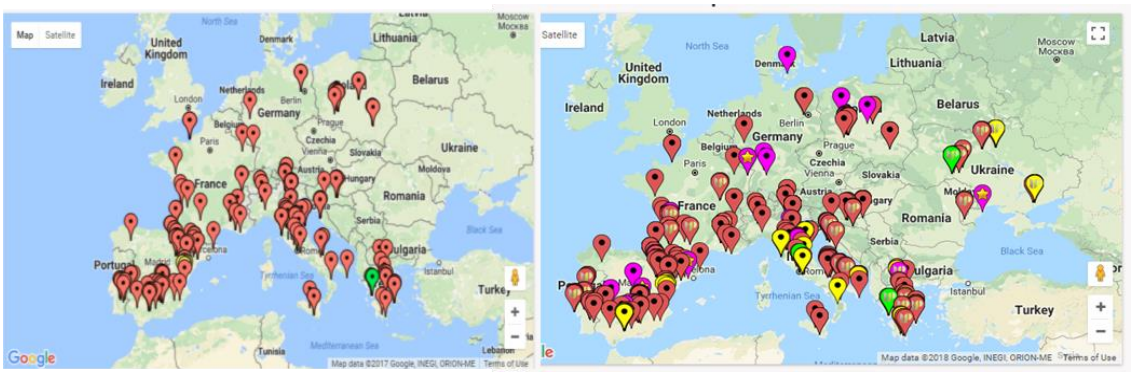

Figure 1. Home page of the Observatory Tool. Left: Progress of year 1. Right: Progress of year 2 (http://www.up-running-observatory.eu/)

2 BIOMASS PRODUCTIVITY FOR PRUNINGS

2.1 Data sources

Till May 2018, the Observatory contains 355 data points regarding field measurements related to biomass productivity from agricultural prunings. The distribution of the origin of those data points is as follows:

- 159 data points were collected from various literature sources ([1],[2],[3],[4],[5],[6],[7],[8]); most of these sources were previously studied CIRCE in the framework of the EuroPruning project ([9]).
- 71 data points originate from surveys performed in the framework of the EuroPruning project; the results of those surveys were communicated to CERTH by CIRCE.
- 125 data points were collected from new field measurements performed by the uP_running project partners and reported to CERTH till the beginning of May 2018.

Table 2. Summary of field measurements contained in the Observatory by crop, type of information source, irrigation regime and country.

Crop group	Number of recorded experiences				
	Total	Literature	EuroPruning surveys	uP_running field measurements	Countries
Vineyard	138	57	13	68	Spain, Italy, Greece, France, Portugal, Ukraine, Croatia
Olive	75	43	7	25	Spain, Italy, Greece, Portugal, Croatia
Seed fruit (apple, pear, fig, kiwi, guava)	73	31	23	19	Spain, Italy, Greece, France, Ukraine, Croatia, Germany, Poland, Mexico
Stone fruit (peach, cherry, apricot, plum)	46	16	20	10	Spain, Italy, Greece, France, Portugal, Ukraine, Croatia, Germany, Poland
Citrus (orange, lemon)	7	2	5	-	Spain, Italy
Nuts (almond, walnut)	14	10	3	1	Spain, Italy, Croatia
Other (Pinus pinea)	2	-	-	2	Portugal

2.2 Pruning biomass productivity per crop type

In order to assess the biomass productivity from prunings, two types of ratios are commonly employed in the literature. The first, is the biomass production per hectare (t/ha), referred as Residue to Surface Ratio (RSR). The second type refers to the amount of prunings per amount of fruit and is known as the Residue to Product Ratio (RPR).

In the literature, several sources can be found from local or general biomass assessment studies. However, when aiming to produce a biomass assessment in large scale a single ratio is used for each crop for whole territory.

According to a previous detailed study carried out in 2007, the EuroPruning project came to the conclusion that the RSR ratios showed non-acceptable values to reproduce the local reality, in contrast with the RPRs ratios which were proposed as a better approach. Nevertheless, RSR ratios were used in most of the EuroPruning project outputs, since the use of RPRs requires to measure or to know the yield production of fruit.

In the uP_running Observatory, RSRs are also the main data recorded regarding the pruning biomass productivity from a field. By presenting a wide range of information about the field conditions, interested parties can check whether a data point with a given RSR value would be a good match for their own fields. Some further information about the RPRs measured or estimated at the new uP_running field measurements is presented in this report.

Considering the results that are recorded in the Observatory, the main factors that appear to be influencing the biomass productivity are the pruning method that is implemented, the pruning frequency, as well as the climate conditions prevailing in every area. Depending on the pruning method that is performed (structure, maintenance pruning, or removal of old branches, etc.) and how often this procedure happens (once/twice every year, once every two/tree years) the pruning productivity may differ extremely. Concerning the climate conditions, they can play a major role in the growth of the crop and therefore to the amount of the collected pruning. Temperatures may have important consequences on the production of fruits by causing early or late start of the reproductive stage (e.g. if a crop undergone aridity the growth of the trees will be deteriorated and the pruning method will be less strict than it would be if there was enough moisture in the ground. As a result, the pruning will be much less).

2.2.1 Olive trees

Prunings that are collected from olive trees consist a large amount of biomass which is not utilized properly. The EuroPruning project recorded biomass productivities ranging from 0.40 t/ha dry material (the minimum value) to 10.90 t/ha dry material (the maximum recorded value in a case where the pruning frequency was once every three years). The pruning frequency as it is recorded from all the APPR experiences is ranged between one and two times per year, and rarely tree times of year.

Overall, the registered data points on the Observatory tool concerning olive tree pruning are 75; Figure 2 presents the location of all the recorded field measurement experiences.

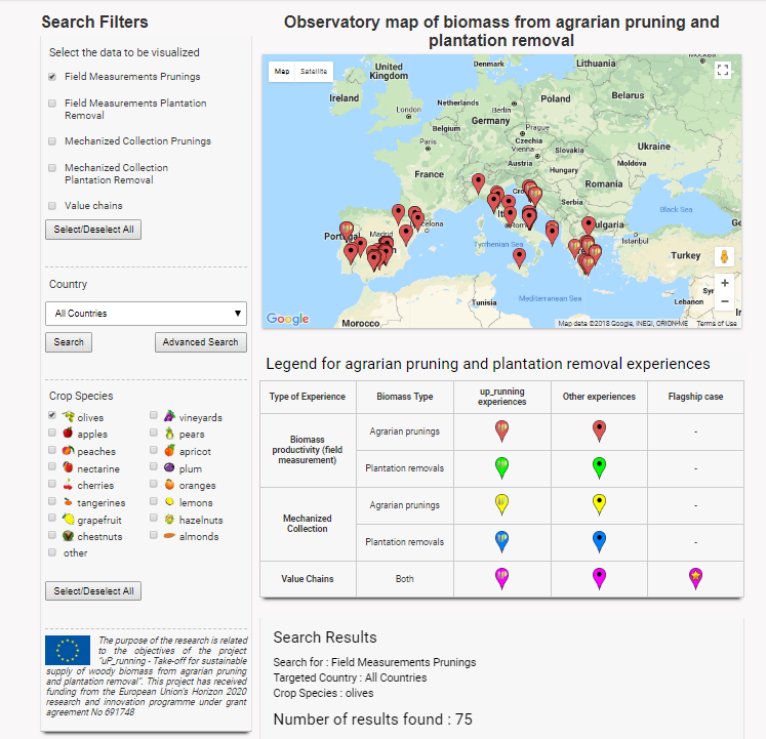

Figure 2. Data collected from olive tree prunings (http://www.up-running-observatory.eu/en/)

In Table 3, the results from the 75 measurements that are both performed and recorded in olive trees during the uP_running and EuroPruning projects up to date are presented. As we can see in the table below 25 new measurements are recorded due to the framework of the uP_running project and the biomass productivity of each country was calculated using the given moisture content, which in the most cases was close to 35 %. An exception consists the case of Italy where the maximum value of biomass productivity reaches the 14.40 t/ha of dry biomass. It is believed that the main reason for this deviation is the vigorousness of the certain olive tree variety as well as the pruning frequency, which in this case was twice a year. In this point we should mention that an indication of the errors can be generated when a biomass assessment fails to take into account local conditions.

Table 3. Summary of biomass productivity measurements from olive groves included in the uP_running Observatory (up to May 2018).

Source	# data	Biomass productivity (t/ha, dry)	
		Minimum	Maximum
uP_running: Croatia	5	0.82	1.64
uP_running: Portugal	2	7.41	8.53
uP_running: Italy	8	0.59	14.40
uP_running: Greece	10	2.25	9.31

Source	# data	Biomass productivity (t/ha, dry)	
		Minimum	Maximum
Literature & EuroPruning	50	0.40	10.90
(Velázquez-Martí et al., 2011)*[10]	N/A	0.40	4.60
Reported valued refer only to the wood part of the prunings (e.g. the leaf fraction is excluded)			

2.2.2 Vineyards

As it is mentioned above, pruning from olive trees consist a large amount of biomass. However, vineyard residues also consist in a large biomass potential, if we take into account that data gathered from literature and EuroPruning project are referred to biomass productivities from 0.10 t/ha dry material to 2.70 t/ha dry material.

The registered data points on the Observatory tool concerning vineyard APPR are currently 138 and are displayed in the following Figure 3.

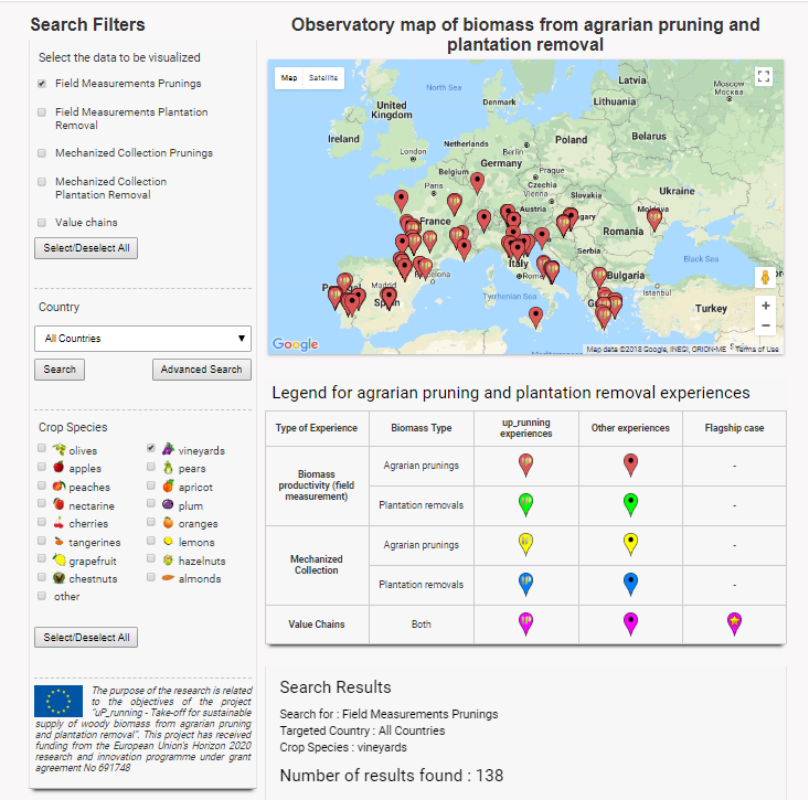

Figure 3. Data collected from vineyard prunings: (http://www.up-running-observatory.eu)

In Table 4, the results from the 138 measurements that were both performed and recorded in vineyard crops during the uP_running and EuroPruning projects up to date, are presented. Looking closely the table below we can see that the recorded uP_running measurements are in total 68 data

points much more than the olive field measurements. Moreover, we can observe that the maximum vineyard biomass productivity ranges in 2.60 t/ha dry biomass, apart from two occasions, Portugal and Italy. In the case of Italy this deviation is based on the pruning type (grafting pruning) that was followed in some cases, and as a result the biomass productivity was much higher than it was in the other measurements. As for the case of Portugal, according to the feedback from CONFAGRI the high productivity in these measurements is based on the age of the plantations (they are new vineyards orchards and professional fields). It is good to mention that the below values of the biomass productivities per country were calculated based on the given moisture content from each partner, but the typically moisture analysis for some measurements below is around 40-50 %.

Table 4. uP_running field measurements from vineyards (up to May 2018)

Source	# data	Biomass productivity (t/ha, dry)	
		Minimum	Maximum
uP_running: Croatia	10	0.44	1.63
uP_running: France	17	0.52	1.76
uP_running: Portugal	7	1.47	7.80
uP_running: Spain	6	0.53	2.07
uP_running: Ukraine	3	1.43	2.42
uP_running: Italy	10	0.53	4.20
uP_running: Greece	15	0.07	2.60
Literature & EuroPruning	70	0.10	2.70

2.2.3 Fruit Trees

The Observatory tool includes data entries from fruit trees as shown in Figure 4. Fruit trees can be categorized into seed fruits and stone fruits. A total of 119 data points are registered.

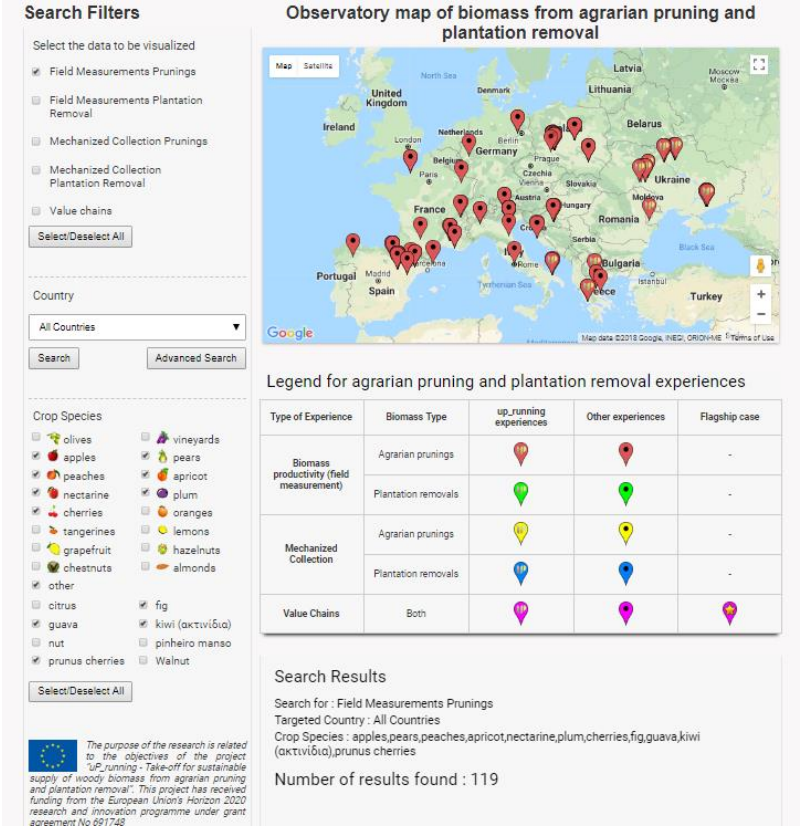

Figure 4. Data collected from all the fruit plantations: (http://www.up-running-observatory.eu/en)

Seed fruit

Seed fruit tree plantations are widespread along Europe, being main varieties apple and pear species. In this category, the minimum value is 0.06 t/ha of dry biomass, measured in apple tree prunings in Poland. The maximum value is 15.13 t/ha of dry biomass, again for apple trees but in France. The above values came from EuroPruning data surveys and different literature sources, where the moisture content of these data points are difficult to be identified.

The collected experiences in the Observatory for this category are 73 data points, 19 of which came from new experiences from the uP_running project and presented in Table 5.

In this category it is worth to mention one exotic crop, guava, which is measured in Mexico (2013) and it is recorded on the Observatory after communication with the author (2017) [8].

Table 5. uP_running field measurements from seed fruit plantations (up to May 2018).

Source	# data points	Type of crop	Biomass productivity (t/ha, dry)	
			Minimum	Maximum
uP_running: Ukraine	18	Apples	0.90	5.50
uP_running: Greece	1	Kiwi	-	9.44
Literature & EuroPruning	54	Apples, pears, fig	0.06	15.13

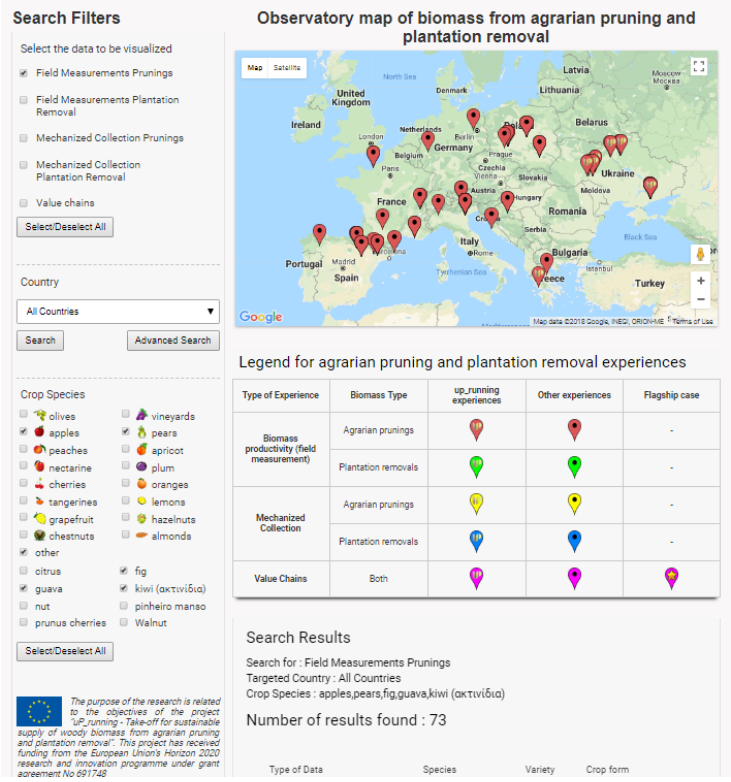

Figure 5. Data collected from all seed fruit plantations: (http://www.up-running-observatory.eu/en)

Stone fruit

Stone fruits group includes species such as peach, apricot, nectarine, plum, cherries and sour cherries. The collected experiences in the Observatory for this category amount to 46 data points from locations in Poland, Spain, Croatia and France. The maximum and the minimum values for all the stone fruit categories are shown below in Table 6. The maximum value for all the species was 5.38 t/ha of dry biomass and the minimum was 0.30 t/ha of dry biomass. In most cases, the moisture content is between 40 – 50 %. In the following table are also included new field measurements which took place in the framework of uP_running project and are now presented on the Observatory tool as uP_running experiences.

Table 6. Typical values of the stone fruit plantations as they collected from the APPR experiences (up to May 2018).

Source	# data	Type of crop	Biomass productivity (t/ha, dry)	
			Minimum	Maximum
uP_running: Ukraine	5	Cherries, Peaches, Plum, Apricot	1.06	5.08
uP_running: Italy	3	Peaches	1.10	1.65
uP_running: Greece	2	Cherries, Plum	0.57	3.92
Literature & EuroPruning	36	Cherries, Peaches, Plum, Apricot	0.30	5.38

Below in Figure 6, all the recorded APPR experiences, regarding the stone fruit prunings, are displayed.

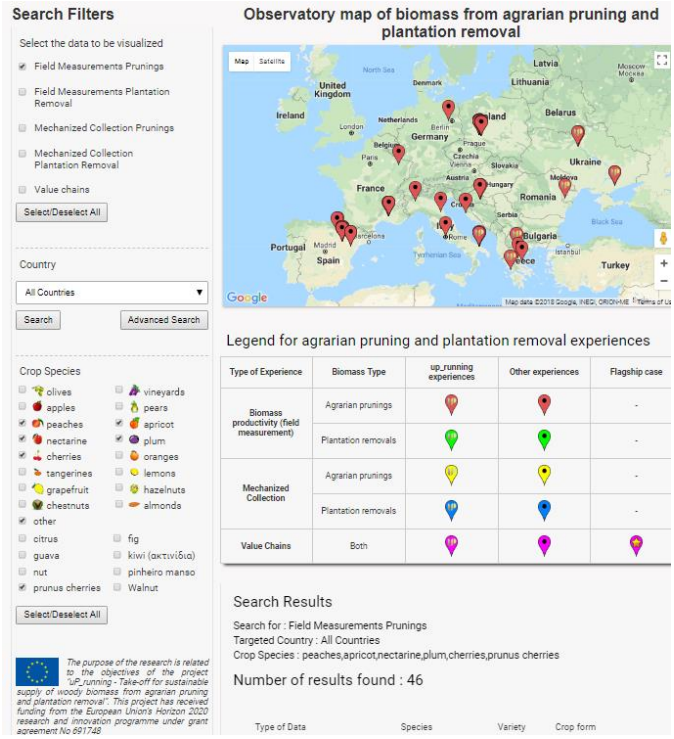

Figure 6. Data collected from all stone fruit plantations: (http://www.up-running-observatory.eu/en)

2.2.4 Citrus Trees

Citrus species are cultivated in warm coastal areas in Europe, mainly in Spain, Portugal, Greece and Italy. These plantations usually follow intensive cultivation with irrigation and their pruning residues are branches with wood and leaves because of their perennial character. The collected experiences in the Observatory are currently 7, and came from EuroPruning survey data and literature sources. The moisture content is typically around 40-50 %. However, it is worth to mention that according with the following paper [11], citrus plantation residual biomass is ranged between 2.4 and 4.7 t/ha dry biomass.

In Figure 7, all the recorded APPR experiences, regarding the citrus trees prunings, are displayed.

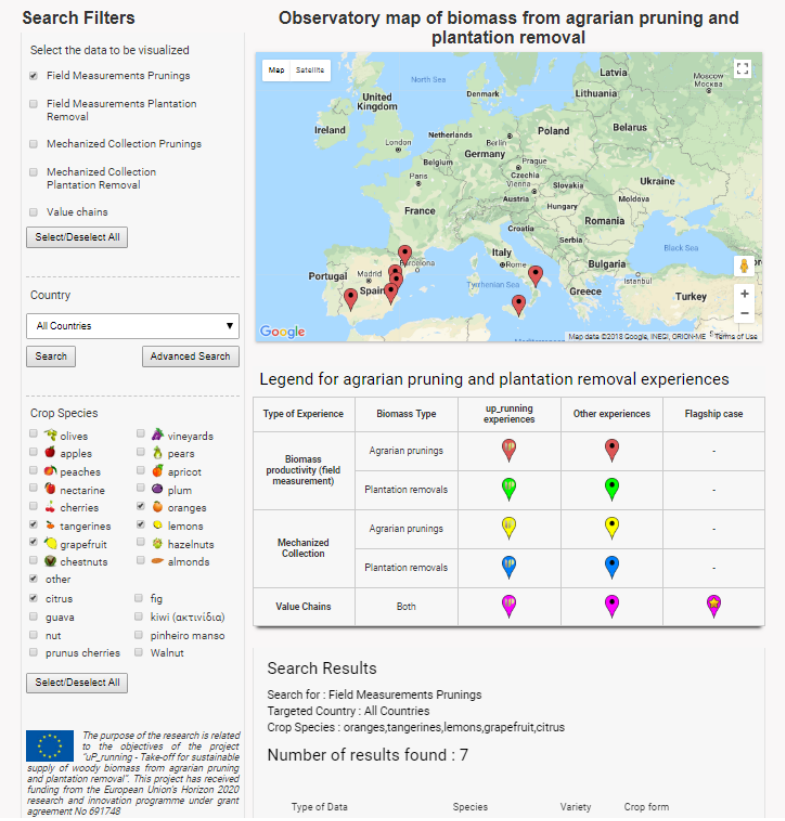

Figure 7. Data collected from all citrus fruit plantations: (http://www.up-running-observatory.eu/en)

2.2.5 Nuts Trees

Nut fruit group include crops like almonds, hazelnut, walnut and chestnut, among others. Whereas almond is a specie with low requirements of cold to fit its phenology to local climates, other nut crops are more adapted to cool areas, and so, are distributed in oceanic and continental climates. Just like citrus plantations, nuts trees have also a small amount of pruning biomass. The collected experiences in the Observatory are 14 and the main source of these measurements is Spain with 1.31 t/ha of dry biomass as an average value with a moisture content of 45 %. In Table 7 and Figure 8 below are shown the collected data from all the nuts trees plantations. As we can see there is one uP_running experience in the wide area of Italy in almonds crop. The biomass productivity is quite high in contrast with the literature sources, and this is due to the pruning frequency that is performed in this cultivation (once every three years). The moisture content is typically around 40 - 50 %.

Table 7. Typical values of the nuts trees plantations as they collected from the APPR experiences (up to May 2018).

Source	# data	Type of crop	Biomass productivity (t/ha, dry)	
			Minimum	Maximum
uP_running: Italy	1	Almonds	-	25.00
Literature & EuroPruning	13	Almonds, Hazelnuts, walnuts	0.18	6.93

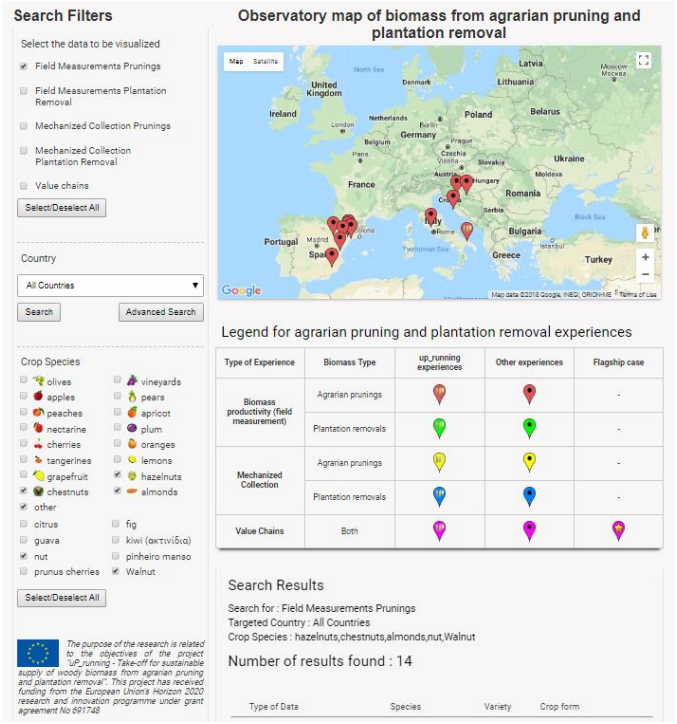

Figure 8. Data collected from all nut fruit plantation: (http://www.up-running-observatory.eu/en)

3 FIELD MEASUREMENT OF PLANTATION REMOVAL

3.1 Data sources and results

Recorded experiences with the biomass productivity from plantation removals are much rarer than prunings. The main reason is believed to be the large cycle or infrequency of such operations.

Currently, the Observatory contains 7 experiences concerning the biomass productivity from plantation removal, 5 of which are recorded during the uP_running project. The other 2 experiences come from published papers: [12], [13].

The first recorded experience came from an interview with a farmer conducted during the uP_running project activities. Orange trees were removed from the plantation in order to change the crop and the stems were used as firewood. The biomass productivity is estimated at 44 t/ha of dry biomass with a moisture content of 45 %. All the recorded experiences with the main information for each of the uprooted case are presented in the Table 8 below. Moreover, Figure 9 shows the general view of the European plantation removal situation.

During the course of the uP_running project, it is expected that it will be possible to collect further biomass productivity experiences with uprooted material.

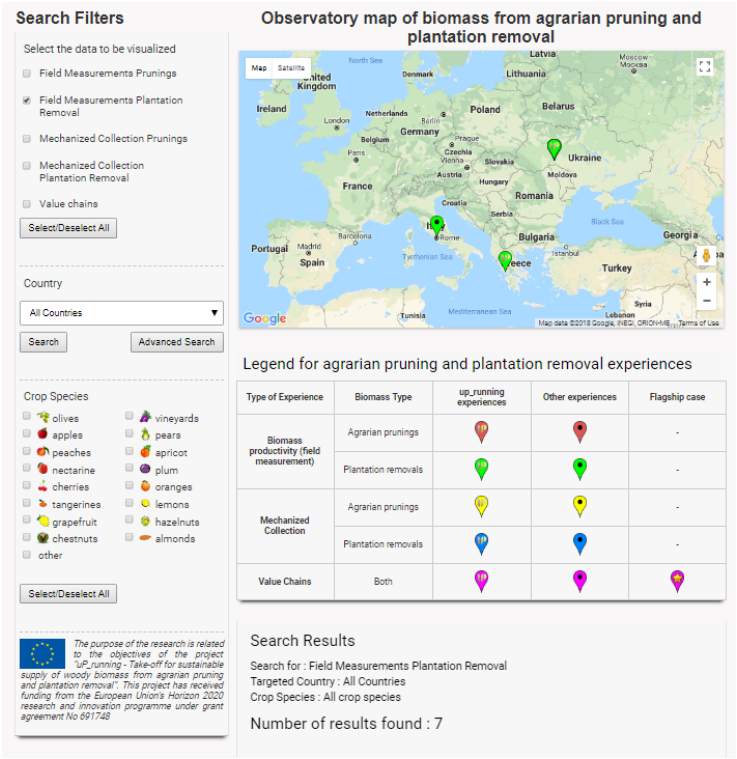

Figure 9. Recorded data for plantation removals in Europe: (http://www.up-running-observatory.eu/en/)

Table 8. Field measurements plantation removals experiences uploaded on the Observatory (up to May 2018).

Source	Country	Type of crop	Age	Reason for removal	Biomass productivity (t/ha, dry)	Part of plantation measured
Other (interview with farmer)	Greece	oranges	35	Change of crop	44.00	Only stem
Alissa Kendall & Elias Marvinney (2015)[12]	United States	almonds	25	Old age	24.28	Full tree
Stefania Proietti,et.al (2014)[13]	Italy	olives	11	Research study for carbon footprint	4.60	Only stem
					15.12	Only branches
uP_running	Ukraine	plum	45	Old age	10.59	Aereal part (stem + branches)
uP_running	Ukraine	apples	45	Old age	20.93	Aereal part (stem + branches)
uP_running	Ukraine	cherries	46	Old age	14.31	Aereal part (stem + branches)
uP_running	Ukraine	pears	45	Old age	31.00	Aereal part (stem + branches)

4 MECHANIZED COLLECTION OF APPR BIOMASS

4.1 Data sources

In this section the uploaded data came from 6 papers: [14], [10], [15], [16],[17], [18]. From these six papers, it was possible to compile data for 25 different collection experiences, which are uploaded on the Observatory as separate data points. A summary of these experiences is presented in Table 9.

During the second year of the uP_running project 10 more mechanized activities were also recorded, which are referred on the Greek and the Ukraine demonstrations that are taken place due to the needs of D6.3. Moreover, from the Ukraine side it is also recorded the first mechanized collection plantation removal experience, which was performed in apples plantation and had a biomass productivity of 3.96 t/h dry material. In

Table 10 these demo activities are presented and in Figure 10 all the recorded measurements of mechanized collection of prunings from the uP_running project are displayed.

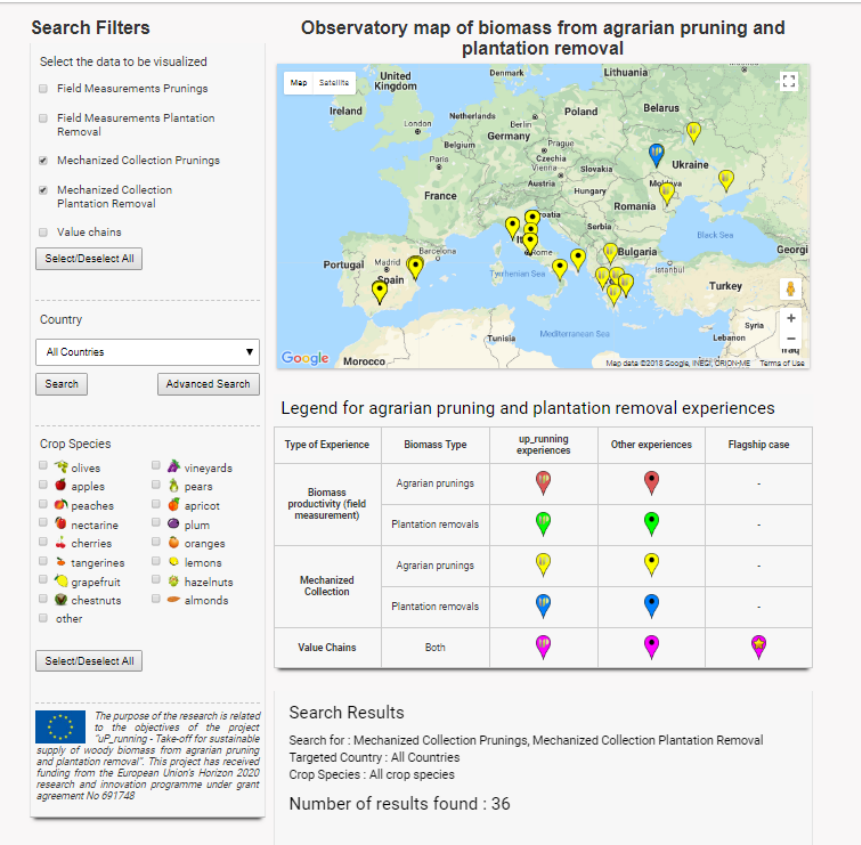

Figure 10. Recorded data for mechanized collection of prunings: (http://www.up-running-observatory.eu/en/)

Table 9. Mechanized collection experiences uploaded on the Observatory from literature sources.

Source	# data	APPR type	Location	Harvesting method	Models
(Spinelli R & Picchi G, 2010), [14]	10	Olive tree prunings	Palenciana, Spain & Follonica, Italy	Rear mulcher/chipper + trailer	Jordan
				Automotive shredder/chipper with rear trailer	SAT-4
(Velázquez-Martí B & Fernández-González E, 2009), [10]	5	Olive tree prunings	Valencia, Spain	Rear mulcher/chipper + trailer	Promagri 2000 Jounes Atila Pick-up S Biomasa 180
				Rear mulcher/chipper + bin	Serrat Olipack T1800; Berti Picker C180
(Spinelli R., N. Magagnotti, and C. Nati., 2010)[2]	4	Vineyard prunings	Montecarotto, Italy	Rear baler	LERDA 900 L (square); CAEB MP 400 S (round)
				Rear mulcher/chipper + big-bags	Nobili TRP 145 RP
				Rear mulcher/chipper + integrated bin	Berti PC 140
(Spinelli R., R.S., Magagnotti N., Nati C., Pari L., Vanneste J. L., 2012), [15]	3	Kiwi prunings	Cisterna di Latina, Italy	Rear mulcher/chipper + integrated bin	Facma Comby 20
				Rear mulcher/chipper + re-usable bin	Nobili TRP 140 + forwarder (Sossai "Cat")
				Rear baler	CAEB MP 400
(Assirelli A., A.A., Croce S., Spinelli R., Santangelo E., Pari L., 2013), [16]	1	Olive tree prunings	Castrigliano de' Greci, Italy	Rear mulcher/chipper + integrated bin	Tierre Futura 160 Omat TSB 1900 Sgarbi TR-RAC Facma Comby TR 200 Berti Piker-Kargo 200

				Rear mulcher/chipper + trailer	Nobili TRP-CV 145
(Dr. Luigi Pari,2002), [18]	2	Olive tree prunings, Vineyard prunings	Sabina, Cosenza, Italy	Rear shredder	Haychopper Gallignani P120
				Rear baler	Arbor RS 170

Table 10. Mechanized collection experiences uploaded on the Observatory collected from uP_runnig demonstrations (up to May 2018).

Source	# data	APPR type	Location	Harvesting method	Models
uP_running WP3 demo: EAS Lakonias	1	Olive tree prunings	Trapezonti, Sparti, Greece	Static chipper	YAMACHIPPER VR35-PTO Heavy duty
uP_running WP3 demo: VAENI	1	Olive tree prunings	Naousa, Greece	Static chipper	Husmann H 5
uP_running WP3 demo: AOS Koropiou	2	Olive tree prunings, vineyard prunings	Koropi, Greece	Static chipper	Bugnot BVE8
uP_running WP3 demo: Agrinio Union	1	Kiwi prunings	Astakos, Agrinio, Greece	Rear mulcher/chipper + integrated bin	Facma Comby TR 200
uP_running WP3 demo: Aichmeas Cooperative	1	Olive tree prunings	Anthochori, Voiotias, Greece	Rear mulcher/chipper + integrated bin	Facma Comby TR 200
uP_running WP3 demo	1	Apple tree prunings	Petrymany village, Ukraine	Static chipper	Hemmel RM51
uP_running WP3 demo	1	Apple tree prunings	Nova Oleksandrivka village, Ukraine	Static chipper	URBAN TR70
uP_running WP3 demo	1	Vineyard prunings	Bolgrad, Ukraine	Static shredder	DM-F-4 modified
uP_running WP3 demo	1	Apple tree prunings	Kostiantynivka village, Ukraine	Static chipper	Heizohack HM 8-400
Total	**10**				

It is worth to mention that in the coming months, it is expected that more APPR mechanized experiences will be uploaded on the Observatory by the uP_running project partners.

5 VALUE CHAINS

The recording of value chains experiences in the uP_running Observatory is an ongoing process. So far, 20 value chains experiences are uploaded on the Observatory, five of them are recognized as the first five flagships cases around Europe. The experiences have been previously compiled in the framework of the EuroPruning project [19] and have been analyzed in order to collect the data required for filling-in the APPR value chains questionnaire developed by the uP_running project. Some of the flagship cases have been recognized through the EuroPruning project, while two of them (Fiusis and ITC Shabo) came from data gathered during the uP_running project. Below in Table 11 the main characteristics of the recorded value chains experiences are shown. In the coming months, it is expected that more APPR value chain as well as five more flagships cases will be uploaded on the Observatory by uP_running project partners.

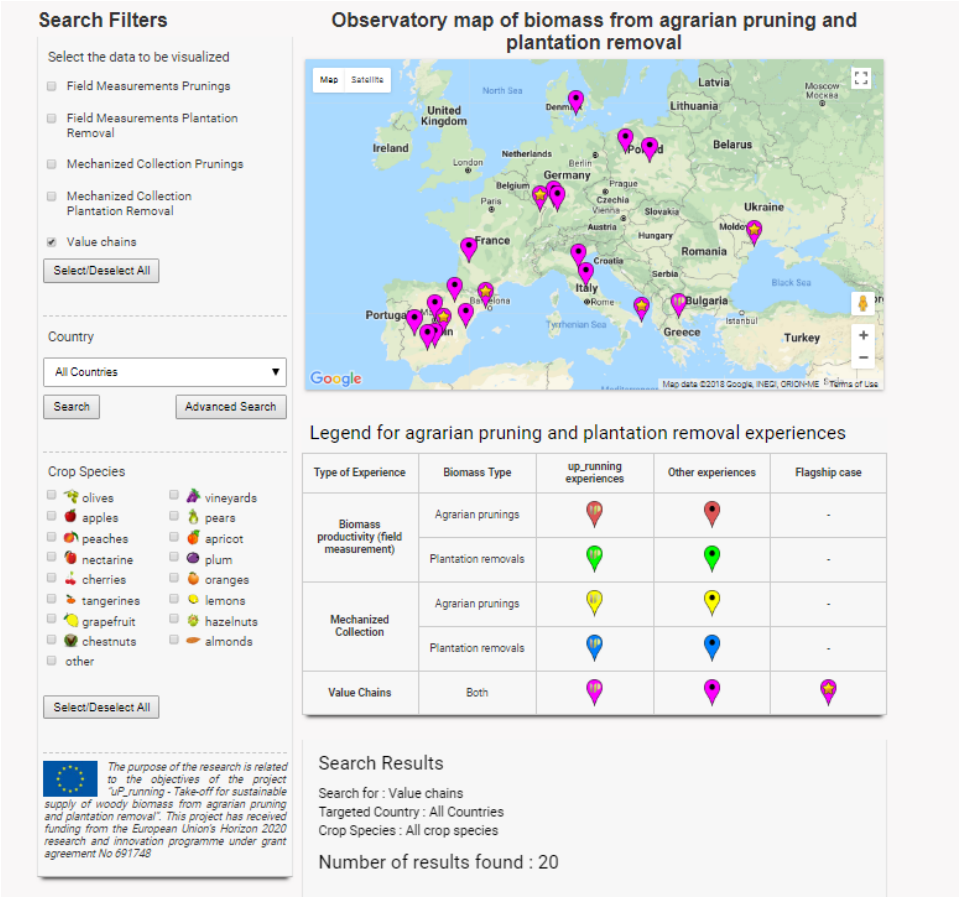

Figure 11. Recorded data for APPR value chains: (http://www.up-running-observatory.eu/en/)

Table 11. Basic information about the APPR value chains recorded in the Observatory (up to May 2018).

Typical APPR biomass mobilization	# cases	Names	Type of cases
< 500 t/y	12	Domaine Xavier Muller (France), BIOTONOS (Spain), GOSPODARSTWO SADOWNICZE (Poland), SCEA Vignobles Jean-Marie CARRILLE (France), S.C.A. Ntro. Padre Jesus (Spain), Stefano Barbien (Italy), Land-und Forstwirtschaftliches Lohnunternehmen Timo Kirn (Germay), Communidad de Regantes de Ria y Toixima (Spain), Vesterled frugtplant (Denmark), Municipal Water Company of Vilafranca (Spain), Roiniczo Sadownicze Gospodarstwo (Poland), Cantine Giorgio Lungarotti (Italy)	Domestic heating (self-consumption) or other heating applications (e.g. municipal heating, small agro-industries)
500 – 2,100 t/y	3	Stadt Land Fluss (Germany), ITC Shabo (UKraine), AREX Medio Ambiente (Spain)	Heat production in larger agro-industries, co-firing fuel for biomass CHP / power plants
8,000 t/y	1	E.A.M.E.B. (Greece)	Wood chips from plantation removals for power plant
8,000 t/y	1	Fiusis (Italy)	Power production (exclusively from APPR)
Up to 20,000 t/y	1	Pelets de la Mancha (Spain)	Large-scale pellet / chip production (exclusively from APPR)
> 84,000 t/y	2	Valoriza Energia O&M (Spain), Oleícola EL TEJAR (Spain)	Co-firing fuel for biomass power plants
Total	**20**		

6 CONCLUSIONS

The uP_running Observatory tool is created with aim of acquiring a simple to use web tool that register the APPR biomass potential and mechanized collection experiences of the agricultural sector, mainly, across Europe. These data points capture the picture of APPR biomass production across European countries along with information of the fields. The latter is an option so as for the farmers to compare field conditions, view other field's methods and find similar circumstances that apply to their field for the optimum exploitation of APPR biomass. So far the population of the Observatory web tool is in a very good point and has made a significant progress. 418 data points have been recorded, from which 355 concern field measurement of pruning production, 7 are field measurements of plantation removal, 35 mechanized collection of prunings, 1 mechanized plantation removal experience and 20 value chains from which are recognized and presented as flagships cases. The Observatory is expected to make a good progress with the uploading of new experiences in the third project year, taking into account new field measurements performed by the uP_running project partners and experiences from mechanized collection during project demonstrations.

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