

PLANT WILD

Forest Plants Wild Harvesting Learning in Europe



# **PLANT WILD PROJECT**

Grundtvig Learnership Association

Project report

## Forest Plants Wild Harvesting Learning in Europe

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Written by:

<u>E. Moré<sup>1</sup></u>, R.Melero<sup>1</sup>, A.M.Barata<sup>2</sup>, V.Lopes<sup>2</sup>, F.Rocha<sup>2</sup>, J.Radusiene<sup>3</sup>, B.Karpaviene<sup>3</sup>, H.Cetinkaya<sup>4</sup>, N.Sekeroglu<sup>4</sup>, Muhittin Kulak<sup>4</sup>.

<sup>1</sup>Forest Sciences Center of Catalonia, Medicinal and Aromatic Plants Group, Ctra. Sant Llorenç de Morunys, km.2. – 25280 Solsona (Spain). E-mail: <u>eva.more@ctfc.es</u>

<sup>2</sup>Instituto Instituto Nacional de Investigação Agrária e Veterinária, Banco Português de Germoplasma Vegetal, Quinta de S. José, S. Pedro de Merelim, 4700-859 Braga (Portugal)
<sup>3</sup>Nature Research Center, Institute of Botany, Laboratory of Economic Botany, Žaliųjų Ežerų g. 49, LT-08406 Vilnius (Lithuania).

<sup>4</sup>Kilis 7 Aralik University, Faculty of Arts and Sciences, Department of Biology, Mehmet Sanlı Mah. Doğan Güreş Paşa Bul. No:134, Kilis (Turkey).





## Introduction

**Non wood forests products** (NWFPs) are an important but sometimes forgotten income from rural and mountainous areas of Europe.

It is necessary to **find sustainable economic opportunities** for the people still living there, to preserve the population, the natural heritage, the biodiversity and the natural resources. Wild berries are a source of vitamins and antioxidants and nowadays Medicinal and Aromatic Plants (MAPs) wild harvesting is still needed to provide raw material to medicinal, food, cosmetic and perfumery industry.

These plants' **wild harvesting is a limited activity** but one of the few opportunities in rural and mountainous areas, which has to be planned properly in order not only to **avoid overexploitation** that could damage the flora and the environment, but also to **prevent bad entrepreneurial management** as well as to afford successful economies.

Therefore, the wild harvesting activity has to follow **sustainable good practices** and to focus on sustainable economic enterprises in order to fix the social success. Training on these topics is very important and tools have to be implemented properly.



Non wood forest products and wild harvested medicinal plants





# Objective

The objective of the project was the establishment of a framework between 4 partners from Lithuania, Portugal, Spain and Turkey, for designing and planning and development of the **necessary tools applicable to VET Institutions and SMEs** as well as to adults of disadvantaged rural and mountainous areas in relation with **berries and aromatic and medicinal plants (MAPs)' wild harvesting.** 

The specific objectives of the partnership were:

- Promoting **employment opportunities** in rural and mountainous areas through plants wild harvesting and artisan handicrafts and services related to them.
- Promoting **sustainable wild harvesting techniques** following the existing advisory guides.
- Generating **best training practices** to obtain environmental and economical sustainability.
- Allowing partners to know other realities that may be applied in their territories.
- Determining which **tools to support trainers**, **learners and professionals** are most useful.



The workshops on sustainable wild plant harvesting during the Project





## Methodology

5 meetings were organized to discuss different topics:



1<sup>st</sup> meeting – Solsona (Spain), 20-22<sup>nd</sup> October 2011

- Mission and working lines of partners' organisations and research centres related to the NWFPs, and specifically to MAPs.



2<sup>nd</sup> meeting – Braga (Portugal), 15-16<sup>th</sup> May 2012

- State of the art of research, technology transfer and training for adults in NWFPs in each partner's country.



3<sup>rd</sup> meeting – Vilnius (Lithuania), 10-13<sup>th</sup> July 2012

- Current situation of the sustainable wild harvesting of MAPs in each partner's country and challenges for implementing training.

4<sup>th</sup> meeting – Kilis (Turkey), 9-10<sup>th</sup> May 2013

- Current situation of the businesses of wild harvesting of MAPs in each partner's country and challenges for implementing training.



5<sup>th</sup> meeting – Solsona (Spain), 12-13<sup>th</sup> June 2013

- Good practices on training MAPs wild harvesting and proposals for future projects implementing training in sustainable wild harvesting.

During meetings partners exchanged information and visited successful stories and entrepreneurial business in each country.





## Results

# Partners' expertise on Non-wood Forest Products and Medicinal and Aromatic Plants

Each partner presented their mission and working lines of their organisation's related to the NWFPs, which are mainly devoted to MAPs' conservation, ethnobotany, forest management, domestication, rural development and market surveys.

1st meeting in Solsona (Spain):

- Presentations and visits





The first meeting in Solsona: 1) Workshop for evaluation of mushrooms resources management; 2) Feast of mushrooms

# Research, technology transfer and training for adults in the non wood forest products

Each partner presented the state of art of the research, technology transfer and training in wild harvesting in their countries related to NWFPs.

The Forest Sciences Centre of Catalonia (Spain) presented what has been done over the last 15 years regardin MAPs wild harvesting, the transfer use for promoting controlled mushrooms collection and tree plantations for obtaining truffles, and the forest management techniques for increasing the production of pine nuts, chestnuts and honey, even some information about agroforestry.





The Institute of Botany of the Nature Research Centre (Lithuania) explained the importance of the flora in Lithuania, regarding the conservation and social point of view, and the different events that exist in this country for trading and promoting MAPs.

The Faculty of Arts and Sciences of Kilis 7 Aralik Univesity, showed the commercial importance of the MAPs in Turkey, and the pressure on the environment for obtaining these plants from the wild. They started working with sustainable wild harvesting techniques of a special plant "Zahter" (*Thymbra spicata*) and they held a successful seminar focused on this subject.

The Banco Português de Germoplasma Vegetal (BPGV), summarized an exhaustive research that the Portuguese group engaged in this project have produced about the training in MAPs in Portugal, for a period of 22 years (1989-2011), discovering that the training activities have increased over these last years, while the production (cultivation and wild harvesting) entrepreneurial activities is flourishing. Moreover, the projects related to MAPs and ethnobotany teaching in the Escola Superior Agrária de Bragança and the activities of the development association ARDAL were presented. Some learners, as one from the enterprise Cantinho das Aromaticas, had also the opportunity to present his experience.

At the end of each presentation, the partners did a SWOT analysis of plants wild harvesting training in their country.

2<sup>nd</sup> meeting in Braga (Portugal):

- Presentations
- <u>Visits</u>
- Report



The second meeting in Braga: 1) Visit to the laboratory of long-term seed storage; 2) MAPs collection in Cantinho das Aromaticas





# Sustainable wild harvesting of medicinal and aromatic plants and challenges for implementing training

Information of MAPs wild harvesting in each partner country was gathered, for detecting implementation level of sustainability issues and identifying needs for future training.

Some topics were analyzed:

- State of the art of wild harvesting, for commercial and non-commercial use;
- Legal framework and adoption by collectors;
- Guidelines and certification rules applied;
- Existing sustainable wild harvesting (SWH) training and stakeholders needs.

In addition, each partner presented case studies on sustainable harvesting techniques:

- LITHUANIA: Allium ursinum L.
- PORTUGAL: Vaccinium myrtillus L.
- SPAIN: Gentiana lutea L. and Arctostaphylos uva-ursi (L.) Spreng.
- TURKEY: Thymbra spicata L.

3d meeting in Vilnius (Lithuania):

- Presentations
- <u>Visits</u>
- <u>Report</u>

Moreover, an oral communication on these results was presented in 1<sup>st</sup> Mediterranean Symposium on Medicinal and Aromatic Plants (MESMAP), in the Turkish Republic of Northern Cyprus: *Considerations on the state of the art and training of Medicinal and Aromatic Plants sustainable wild harvesting*.

- Oral communication



The third meeting in Vilnius: 1) Visit to MAPs collection of the Institute of Botany; 2) Čepkeliai Nature Reserve





## Businesses of wild harvesting of medicinal and aromatic plants and challenges for implementing training

The partners presented the current situation of the businesses of wild harvesting (BWH) of MAPs in their countries, taking into account:

- Resource description and distribution.
- Production and use estimation.
- Value chains.
- Training needs according to business point of view.
- SWOT analysis on the plants' BWH in each country.

Each partner focused on the most commercialized species in their country:

- SPAIN: Arctostaphylos uva-ursi, Gentiana lutea, Crataegus monogyna, Rosmarinus officinalis, Thymbra capitata, Lavandula latifolia, Thymus zygis, Cistus ladanifer, Satureja fruticosa, Thymus mastichina.
- LITHUANIA: Rubus idaeus, Urtica dioica, Arctostaphylos uva-ursi, Thymus puleqioides, T.serpyllum, Hypericum perforatum, Cetraria islandica, Artemisia absinthium, Menyanthes trifoliata, Vaccinium vitis-idaea, Lycopodium. clavatum.
- PORTUGAL: Eucalyptus globulus, Pinus pinaster, Cistus ladanifer, Equisetum telmateia, Pterospartum tridentatum, Centaurium erythraea, Tilia platyphyllos, Fraxinus angustifolia, Matricaria recutita, Malva sylvestris, Sambucus nigra, Chamaemelum nobile.
- TURKEY: Laurus nobilis, Ceratonia siliqua, Capparis spp., Rhus coriaria, Glycyrrhiza glabra, Rosmarinus officinalis, Origanum onites, Tilia spp., Prunus mahaleb, Thymbra spicata.

4<sup>th</sup> meeting in Kilis (Turkey):

- Presentations
- Visits
- Report





The fourth meeting in Kilis: 1) Visit to herb and spice shops; 2) The tasting of terebinth fruits (Pistacia terebinthus) drink in the Sekeroglu Spice Company





## Good practices on training wild harvesting

Good practices on how to do an effective training in wild harvesting of MAPs were presented, taking into account:

- **Subjects** -
- Methodology
- Training materials -
- **Target learners** -

In addition, some examples of good practices in training for specific species were presented:

- Chamaespartium tridentatum (L.) P.E.Gibbs, by the learner from the entreprise -ERVITAL (Portugal)
- Sambucus nigra L., by BPGV (Portugal). -
- Edible wild plants, by the learner from the entreprise Naturalwalks (Spain). -

5th meeting in Solsona (Spain):

- **Presentations**
- Visits
- **Report**





The fifth meeting in Solsona: 1) Visit to the Trementinaires Museum in the valley of La Vansa i Tuixent; 2) MAPs garden at L'Avenc de Tavertet





## Conclusions

### **Existing training**



The economic value and marketing opportunities on non-wood forest products (NWFP) is increasing, even the research on some commercial medicinal plants, strength points that are favouring the training in these products. Moreover, old traditions, prepared human resources and scientifically based methodologies could ease the implementation of MAPs' sustainable harvesting.

Nevertheless, there are some weaknesses to take into account, like the lack of people's knowledge of MAPs species and uses, the inexistence of economic studies on the harvesting activity (there are only conservation issues) and a few training on wild harvesting techniques. In addition, MAPs training financed by EU does not fit the sector needs and transfer of novel technologies for sustainable harvest of wild plants is slow. As far as we are concerned, in future EU programmes it should be considered.

Even some threats to overcome are the real danger of overexploitation of wild populations or harvesting of endangered species, and the decreasing of wild harvesting knowledge in relation to botanical identification and habitats. Moreover, the remaining knowledge belongs to elderly population, very closed to traditional practices and uses.

On the other hand, there are **opportunities** to improve the existing training:

- Initiating local projects for adults training in wild plants harvesting.
- Training in sustainable techniques for domestic harvesters.
- In economic value of ecological services.
- Governmental and civil organisations or societies supporting projects of MAPs.





### Sustainable wild harvesting



According to commercial and even non-commercial wild harvesting, there is stated a strong tradition on MAPs harvesting and other NWFP (mushrooms, berries..) in Lithuania, Portugal, Spain and Turkey, but it is difficult to establish the line between commercial and non-commercial species. Some species are collected in very few quantities for local markets, so quantities are not registered in official statistics. Even, statistical register of annual volumes of marketed MAPs follows different pattern in each country, being rather difficult to compare wild harvesting data.

Cultural tradition, socio-economics issues and anthropogenic impact on the environment determines the way of understanding the wild harvesting activity and their monitoring, regulation and control.

Wild harvesting is seen as a threatening activity due to some cases of overexploitation, with high visual impact on habitat and real damage in the species conservation. As a consequence, existing laws are addressed mainly to conservation issues of the most endangered species, not always of commercial interest. Sometimes wild harvesting of not-protected plant resources sometimes falls into illegality, since wild harvesting legal framework is weak and not clear. On the other hand, the most common certification of wild-crafted products is the organic certification.

Very few adult regular training activities had been done in last 5 years. Furthermore, lack of available data on ecology, distribution and conservation status of species probably difficult the implementation of high technical training. So, training activities are not enough to raise society awareness of sustainable wild harvesting.

Sustainable wild harvesting could contribute to maintain, even improve, the species conservation in the long term. However, to assure the sustainability of the commercial activity, wild harvesting should be managed by local communities (the most interested in conserving their own habitats and species in long term).





All stakeholders are important to be trained or, at least, informed on wild harvesting. Nevertheless, the key agents for implementing sustainable wild harvesting are collectors, forest owners and policy makers.

Best training actions for collectors and forest owners are face-to-face courses, workshops and technical documents, while media actions, technical and promotional documents are the most indicated ones for policy makers.

Besides awareness of sustainable wild harvesting, other measures could improve conservation of wild plant resources, such as *ex-situ* and *in-situ*:*on-farm* conservation.

As a result, sustainability is not yet implemented in the current wild harvesting sector in any of the partner's countries but economic activities based on sustainable wild harvesting can be a real opportunity if there is promotion and training among all stakeholders. Then training and knowledge transfer will provide clues to go forward in the sustainable wild harvesting implementation



#### **Businesses on wild harvesting**

There is an important traditional consumption of MAPs, mainly for seasoning, fact that is usually linked to gastronomy and tourism, which provides local communities with additional income. In addition, because of the demand for raw plant material by industry and final natural products by consumers, wild MAPs market and organic certified products are increasing, offering young people with good scientific knowledge a challenging entrepreneurial environment.

In each country, there are many different MAPs species and varieties, with high richness diversity, present in wild habitats. Then wild MAPs are used in different sectors from cosmetic, pharmaceuticals to food industries. This reality leads to the production of tradable products with export potential.





It has been stated a gradual increase of non-wood forest production in the last years, even the use of waste of timber industry (e.g. pine, birch, eucalyptus) for production of extracts and essential oils has to be taken into account.

Nevertheless, it is difficult to know who is working in wild harvesting, as this is a dark sector. And nowadays the number of professional harvesters is decreasing as they are getting older, so traditional knowledge is disappearing with them.

Unfortunately, there is stated few knowledge on botanic and chemistry and lack of information on the habitats of new harvesters commissioned by buyers.

Misidentification of species, by not very well taught people, could involve real health danger to consumers. Incorrect knowledge could affect health security. Sometimes self -educated people teach other people, who are going to do wild harvesting, in plant uses, and they will also transfer incomplete information to consumers.

But even professional harvesters have incorrect information on sustainable harvesting and use of MAPs, and on proper transformation and good manufacturing practices, linked to obsolete technologies and ancient harvesting techniques. Furthermore, legal framework and procedures are insufficient and not well known.

So, there is little concern about the sustainability of resources needed and the quality of products. Existing collectors do not want to change their way of doing wild harvesting, thus sometimes it is difficult to convince them to receive training on sustainable techniques as these are not profitable in a short term.

Manufacturers and wholesalers demand large quantities of raw material and prices paid to harvesters are very low, as many products have high competence from other countries, being submitted to prices fluctuation. Even though, the problem is that most of these countries export raw material and import processed products, without profiting the added value. Then, if prices are low, income will not be interesting for harvesters. As a consequence few people will be interested in being trained in wild harvesting of several species.

Sometimes, despite the increasing industry demand, there is a weak response of the harvesting sector, thus stakeholders are not well represented and there is little differentiation, innovation and investment in the sector.

In addition to that, research on wild MAPs harvesting is fragile and insufficient (lack of information on diseases, forest fire effects...) and there is not enough control and monitoring by the administration in wild areas thus many forests are private. So, increasing training in wild harvesting could raise the number of people accessing to nature to exploit natural resources, endangering species in certain areas.







Therefore, there are some **opportunities for training** MAPs wild harvesting to take into account:



- There is a broader use of timber industry waste and great unused resources of common MAPs species, mainly for the production of extracts and essential oils. So, there is a need to train on the current demand and the raw material's industrial processing of these new products.
- As traditional knowledge of wild harvesting and plant uses is kept by older people, it is important to ensure the knowledge transfer to the younger generation.
- Due to the crisis, more people is searching new business or labour opportunities in rural areas, so more people are interested in harvesting of wild MAPs, and they want to learn extended topics about wild harvesting methods.
- New collectors have low information in botanical identification and habitats knowledge, so training is needed on both subjects.
- New entrepreneurial opportunities related to wild harvesting of MAPs need updated information or training on different uses of value chain (good collection practices, good manufacturing practices, market information) in order to obtain quality products.
- Harvesters that do collection and sell a certified organically product need to be trained in sustainable wild harvesting techniques as this training is not always provided by the certifying entities.





- Existing collectors do not always do the wild harvesting in a correct way, in order to maintain the species and the habitats in long term. International strategies on conservation of biodiversity are pushing to implement sustainable wild harvesting techniques and good collection practices, so it would be prescribed to do training in order to show them that this will be profitable for them, if the resources are preserved.
- Existing collectors harvest everything they find in the nature without differentiating quality. It is important to train people on the richness of MAPs in the different active compounds that could be different from one place to the other for the same species (local chemotypes).
- Even enterprises that use high quality botanicals for medicinal products, chemotyped essential oils for aromatherapy, and fresh herb for obtaining extracts addressed to natural cosmetics, need to be trained on varieties and habitat identification, phenology of each species related to the major active compounds content, as well in good collection and manufacturing techniques, overall if they collect directly from the nature (even if they commission groups of harvesters to do this activity).
- Many harvesters use obsolete transformation facilities for processing the collected plant (dry in the sun, iron distillers...) that leads to a low quality product. They should be trained in the correct way to do the manufacturing and the use of proper facilities (dryers, stainless distillers...).
- There are many abandoned lands where various MAPs could be harvested. Land and forest owners are highly potential harvesters for sustainable use, maintenance and restoration of MAPs wild resources.
- Forest owners do not have enough information on the possible incomes from the non-wood forests products. Training in entrepreneurial opportunities and in the sustainable forest management and use should be done in order to maintain the resources in a long term concept.
- MAPs wild harvesting contribute to population fixation in rural areas of the interior, using those species to generate richness, to have a better quality of life and promotion of endogenous values of each region and territory, such as the rural tourism linked to the ecological value, and restaurants and handicraft's offers linked to gastronomic value.





#### **Recommendations:**



- Non professional harvesters, commissioned by buyers, should receive regular training in order to assure the sustainability of the activity
- Local population and professional harvesters should receive updated information about good collection and processing practices, in order to obtain good quality raw material.
- The use of good practices for the wild harvesting of MAPs, with support in the laws and with control, is needed to ensure that these natural resources are long term sustainable.
- Create an effective management information system which is based on professional knowledge of plant reproductive biology and accounting methodology of plant harvesting for sustainable use of wild resources of MAPs.
- To avoid overexploitation, a local or regional entity should be responsible for the MAPs wild harvesting activity control.





### Good practices on training



The rising public interest in collecting and usage of MAPs leads to the need to develop the best training model that provides diverse knowledge on sustainable wild harvesting and usage of MAPs. There is a lot of information about usage of MAPs in variable books and websites, however, for proper identification of plant species the guidance of specialist and contact with living plants are essential.

The aim of good practice for wild harvesting training on MAPs is to provide learners with knowledge and practical skills and qualify them so that they will be able to perform sustainable wild harvesting of MAPs.

There were distinguished several target learners groups for wild harvesting of MAPs. These groups involved both individual and stakeholders employed collectors that require training for wild harvesting of MAPs.

**Target learners** of good practice for wild harvesting training in MAPs are following:

- Population harvesting raw material for their personal use.
- Local population employed by a farm.
- Group of harvesters which work commissioned by a buyer.
- Professional harvesters.
- Enterprises supplying the raw material for processing products.
- Forest owners.
- Promoters of MAPs projects.
- Policy makers.

Knowledge of plant biology, ecology, botanical identification, bioactive compounds and storage patterns, theoretical and practical skills on plant harvesting and post-harvesting technologies, knowledge of market and business framework, as well as knowledge on legal acts and legislative measures regulating wild plant harvesting, are essential for professional harvesting and sustainable usage of MAPs resources.





There were distinguished six training modules which are the following:

- 1. Basics of plant science with emphasis on MAPs.
- 2. Knowledge of MAP species.
- 3. Harvesting of raw materials and use.
- 4. Sustainable wild harvesting: methodology, legislation and control.
- 5. Post-harvest processing of MAPs.
- 6. Marketing and business.



#### **M1.** Basics of plant science with emphasis on MAPs

Numerous factors influence the quality and production of plant material. Knowledge of main ecological and biological characteristics of target species is essential for harvesting of desired plant materials of the corresponding species.

Training subjects of the module are recommended as following:

- 1. Plant ecology and habitats of MAPs;
- 2. Plant phenology;
- 3. Plant bioactive compounds, their localization and accumulation patterns;
- 4. Plant use in: pharmacy, cosmetology, condiments.



#### M2. Knowledge of MAPs species

Medicinal plants used in folk or traditional medicines represent a relevant part of the natural biodiversity. However the assortment of plants harvested in wild is very limited by lack of the people's knowledge of plant species.

The training subjects of the module are recommended as following:

- 1. Botanical identification;
- 2. Species of highest demand for raw material;
- 3. Endangered and protected MAP species;
- 4. Species with different and special recommendation for use.







M3. Harvesting of raw materials and use

Sites of synthesis and storage of active compounds are different according to the plant species and season. To collect a high-quality herb material, the appropriate part of the medicinal plant must be harvested at the optimum phase of development.

The training subjects of this module are recommended as following:

- 1. Harvesting calendar of raw materials;
- 2. Species raw material harvested in spring;
- 3. Species raw material harvested in summer;
- 4. Species raw material harvested in autumn;
- 5. Good Harvesting Practices.



M4. Sustainable wild harvesting: methodology, legislation and control

The aim of sustainable wild harvesting of MAPs is to protect and restore wild resources by ensuring their rational use. Those principles are the background for all activity related to wild harvesting of MAPs.

The training subjects of this module are recommended as following:

- 1. Sustainable wild harvesting methodology;
- 2. Framework of European and national legal for sustainable wild harvesting;
- 3. Control system for wild harvesting.







M5. Post-harvest processing of MAPs

The post-harvest processing highly affects the quality of final product from plants. Processing technologies of plant material vary depending on what material will be used: for food market as fresh herb and condiment or food supplements, for distillation of essential oil or for dry herb material which will continue to be processed.

The training subjects of the module are recommended as following:

- 1. Post-harvest technologies;
- 2. Processing of raw material;
- 3. Quality Management;
- 4. Good Processing Practice.

#### M6. Marketing and business



Wild plants are used in different sectors of cosmetic, pharmaceuticals to food industries. Because of the demand for raw plant material by industry and final natural products by consumers, wild plant market is rapidly increasing. To effectively assess the demand and market potential for MAPs, two sectors need to be recognized: unprocessed or crude herb medicines and processed herbal medicines. The numerous opportunities for MAPs market growth is through adding value by processing and packaging.

The training subjects of the module are recommended as following:

- 1. Market demand and changes;
- 2. Products elaboration and distribution;
- 3. Good manufacturing practices.



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Several training **methodology** actions on wild harvesting of MAPs were defined to achieve the training objectives:

- 1. *Regular training*: teaching courses and workshops included in official training courses.
- 2. Voluntary training: courses and workshops not included in official training courses.
- 3. *Open seminars*: seminars or workshops related to the transfer of knowledge included in scientific projects.
- 4. Media actions (TV, radio and press releases).
- 5. On-line training, regular or voluntary.
- 6. *Practical training* in MAPs collections, botanical gardens and field trips.
- 7. Practical work on processing of raw material.

#### And specific tools and measures:

- 1. Handbooks and professional books.
- 2. Plant catalogues and descriptors.
- 3. Promotional documents: leaflets, posters, videos.
- 4. Technical documents: documents with technical or scientific information.
- 5. Training brochures and booklets for sustainable wild harvesting methods.
- 6. Websites.



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http://plantwild.wordpress.com