

# The SYLVAPI programme

## *Creating multifunctional afforestations which interest the beekeepers*

From 1990, the apiculturalists informed us about their anxiety of the general impoverishment of the resources of pollen and nectar producing vegetation in the rural and forest environment. The forest, often presented as an enemy of beekeeping on the occasion of big afforestations, can become an ally. For some years, the environmental and landscaping concerns have accompanied the silvicultural operations. The importance of protecting the biodiversity of flora and fauna together with the quality of the landscaping has been recognized.

Numerous species of trees are of interest to the apiculturalist because their flowers produce nectar or pollen, but also (sugar syrup) produced with the complicity of aphids and propolis taken from buds. Certain honeys of tree are highly regarded such as acacia, lime, and fir or chestnut tree honeys.

To answer the environmental requirements, respect and improvement of a landscape, a variety and enrichment of flora and fauna, was one of the ambitions of the program Sylvapi set up in 1992 by the Regional Centre of the Forest Property of Languedoc Roussillon.

The program began with some apisyvicoles plantations, first stage of the program Sylvapi, developed at the time with the financial support of the Fund of Management of the rural space (FGER), which regrettably disappeared since; so, between 1996 and 1998 more than 50 ha of plantations were realized on 60 plots of land, distributed according to the various ecological conditions of the region Languedoc Roussillon and in different environments.

## **The evolution of the forestry**

The current Sylviculture, which advocates the low density of plantation and allows the light to come through the trees planted, is favourable to the beekeeping because the tops of the trees get more sunlight which helps the development of a flora in undergrowth. Many precious broad-leaved trees (wild cherry, maples), of forest fruiterers (mountain ash etc), as well (willows, hazel trees, hawthorns) will flower well if they get more sun light.

In the programme **Sylvapi** we wanted to go further by creating spaces for apiculture by planting such trees as ash, pear trees, crab apples, lime trees and other trees or shrubs which are still little used in forestry as well as other trees or shrubs with interesting flowers but not used by the foresters, as the evodias.

For a great majority of mellifloral essences identified during this programme, the mellifloral interest is associated with other qualities: the production of special wood, the quality of the created landscapes (by the contrasts and the colours of their blooms and/or autumn foliage), their cynegetic contribution by the production of wild fruits and the creation of shelters for game etc.

A particular attention must be given to the following types of plantation:

1. **Hedges** which can be established by a combination of mellifloral plants from small shrubs to the big trees. An additional asset not to be forgotten: they protect the places of apiaries.

2. **Plantations by fragrance;** many leafy species are considered little social (wild cherry, ash tormal, etc.) but are very well adapted to the plantation by fragrance going from 0,2 to 2 ha. The grouping together of subjects of the same species favours their attraction to the bees as well as efficiency of the nectar collection.

3. **The introduction of some necessary subjects,** as the willow near the apiaries which can supply the pollen necessary to help the start up of bee colonies.

Finally, also let us stress all the flora which accompanies the tree plantings and which develops during a dynamic silvicultural forestry; by allowing to let the light shine through to the forest floor, the mellifloral plants such as brambles, ivy, will establish themselves.

### **Some essential data**

The distance of nectar producing sources is an element determining harvests: the area for effective collection rarely exceeds a circle of 1 km (approximately 300 ha); beyond, the return on bees is too low. For trees that supply pollen at the end of winter or autumn, it is better to stay below 500 m.

The wind, and its connection with drought, can cause the infertility of nectar producing glands, tires bees and hinders the development of trees.

The work of worker bees is facilitated by the grouping of flowers (a bee must visit between 150 to 400 flowers to fill its honeycomb); even an isolated tree, favours a speedy collection due to the importance of its resources in particular because of the flowers it carries in its crown.

An abundance of pollen at the end of winter or the beginning of spring is necessary for the development of the colonies of bees; trees such as willows, hazel trees, are invaluable forest allies.

### **The bases of a real api-sylvicultural development**

#### **1/ To analyze the mellifloral potential of the neighbourhood and the ecological potential of the surrounding.**

The estimation of the mellifloral potential of a area can be made by a methodical analysis of the surrounding flora, as it had been made by the company of Catalan botany at the request of the USAR (Union of Labour unions Apicoles of Roussillon), for a part of the department of the Oriental Pyrenees. Because of the lack of such an existing work or a complete local analysis, we can content ourselves if we have a good knowledge of the local mellifloral flora or simply by the observation and the return to the hives during the seasons, in particular for a sedentary apiary.

#### **2/ Defining the objective.** We can envisage the following scenarios:

- *The spreading of the flowers* for a sedentary bee-hive. In that case, we use a palette of species adapted to the soil, by grouping them together by scent rather than mixing them. The distribution of the flowering period of several months of the year is

facilitated on a more fertile ground. This objective is particularly adapted to family and secondary bee-keepers.

- ***The correction of a seasonal deficiency in nectar.*** We can use just one or several species, chosen according to their date of flowering and their adaptation to the area. This obviously requires a floral analysis of the environment of the apiary to highlight the main deficiencies. Several species of tree are of particular interest for their summer flowers (certain lime trees with late bloom, sophora, evodias, to savonnier), especially in the regions where few other species flower during this period.



Evodia en fleurs



- ***The contribution of food for the winter,*** by planting flowering trees or shrubs where beehives are kept during the winter so that bees don't need to be fed. The gustative quality of the honey produced by these species is not so important, because the production is mainly used for the consumption of the hive and not for the harvest. The strawberry tree, which gives a bitter honey which is generally not appreciated (except by the Sicilians who like it for its supposed aphrodisiac virtues!) is completely adapted to this objective.

- ***The contribution of pollen at the end winter,*** with trees such as the hazel trees or the willows, which will allow a good development of the brood and a good start of the colony in the first beautiful days at the end of winter.

- ***A good start up of the beginning of spring;*** several early flowering species such as plum trees, pear tree, certain maples, etc. allow to pursue the starting up of the winter end or the beginning of spring as mentioned before and establish a first contribution of nectar. A mono floral harvest of these species is rare, but they can be important for the first harvests of honey of the year.

- ***A mass mono floral production.***

For this we use then a single species of tree, with varieties or clones so they may have different flowering periods in order to increase the period of production whenever possible. The figures of production supplied in the bibliography, in spite of some warnings for their use, show that it is possible to obtain a sufficient quantity of single flower honey. To be realistic in this case it is necessary to establish a larger plantation over several hectares, and to ensure not to mix with species that flower at the same time if we want an original single flower honey. To note however the risk that certain years may not be productive because of unfavourable weather conditions for the growth of the species.

- ***The increase of mellifloral capacities of the site*** without very precise objective, which can be made with all the species adapted to the area. This option will be often chosen in the case of multifunctional afforestations, where the landscaped or cynegetic interest is also of the importance.

- *The creation of a "beekeeping centre"* establishing an arboretum, a site of demonstration or information, a brand image near a place of sale, etc., or any other objective one could to imagine.

- *The creation of an apicole "farm"*. Today beekeepers intend to install and show their apicultural exploitation like a home-farm. In that case, it is necessary to associate with the trees, numerous shrubs and an herbaceous layer, in line with undergrowth kept clear.

### **3/ To establish the list of the possible species according to the previous analyses, and to choose from among them those answering the chosen objective.**

- To facilitate the choice, we established a synthetic picture of about fifty species which were the object of the introductory trials in the various regions of our program in Languedoc-Roussillon area. It specifies the apicultural interest, the flowering period and the adaptation to the soil of each of the quoted species. These last ones had been used for their known or supposed ability of adaptation to the climatic conditions of a plain, Piedmont or Mediterranean high climate, the testimonies of their landscaping interest, mellifloral or cynegetic, the possibility of wood production of high value or at least original, and finally, not to forget, to acquire such a number of different species!

## **Some families of species of particular interest**

Among maples, all mellifloral and to with diverse colours of their foliages, the maple of Montpellier and Sycamore, can always adapted itself to every new situation (see n°619 of July-August, 2001 of the magazine Bees and Flowers).

It's the same for Sorbiers or Alisiers, interesting for bees, landscape and wild fauna (see n° 624 of January, 2002)

Lime trees also deserve a particular attention, because of their immense production of flowers which can start at the end of May and continue until the middle of August according to the species planted.

Numerous articles are already appeared on "the locust tree of Hungary", which is in fact our locust tree; much confusion exists and would require a clarification between the notions of origin, variety and clone of the introduced specie), but it is certain that a sensible use of the Hungarian selections allows an interesting spreading of the flowering seasons..

Some species are also interesting and not only in Mediterranean zone, because they flower in summer when the local vegetation offers no more nectar; this is the case of Sophora, Evodias (called also trees to honey), of the savonnier which flower abundantly in July and August.

We have also already quoted the excellent pollen producing species that should be planted near the beehives, like the strawberry tree in the beginning of winter or willows before the spring which play an essential role in the life of a bee colony.

This work is evolutionary and remains too enhanced. Not enough funds are available today to pursue these investigations and we regret this. Follow-ups should be made in

order to lead to the success both of the plantations and on the mellifloral performances of these species, not forgetting their other environmental assets. Other species not quoted here would also deserve to be studied: phellodendrons, oxydendron, different strawberry trees, etc.

## **What current support is available for the realisation of projects?**

Europe proposes several compatible financial measures of support in line with the spirit of plantations discussed here and which are supported and agreed by France. But these measures must be also adopted by local authorities to be accessible. It is thus necessary to inquire at the level of every region. We can quote in the field of the possible of the PDRH (plan of national rural development):

- The assistance with the costs of installation of a first afforestation on farmland (measure 221)
- The assistance with the first installation of an agroforesters system (measure 222), which allows the installation of lines of trees between cultivated farmland.
- The assistance of the re-afforestation of old copses, copses under forest or forests of inferior quality (measure 122B)
- The planting plan for the environment allows farms the setting-up of hedges and zones of trees in certain zones and for environmental purposes as defined locally (measures 121B and 216)
- The assistance of unproductive investments to answer the environmental stakes in a site Natura 2000 (measure 216).

## **Some recommendations on how to best plant trees**

We remind you here of some major principles to be respected to make a success of your plantation (see the number 582 of March, 1998 of the French magazine of beekeeping Bees and Flowers for more details).

- Make sure that the flowering tree will adapted well to the conditions of the area.
- Work the ground well without turning it over, a good volume of aerated earth will allow the roots to establish themselves well.
- Use young plantations, with a good balance of stalk and roots which should have fine "hairy" roots.
- Plant during the dormant period of the vegetation, and do not expose roots to the wind or to the sun if planting naked roots.
- Spread the roots without bending them (maybe water them beforehand), do not to bury the collar and compress the earth around the plantation
- If need be, water during the first year if the soil is dry, but especially eliminate the herbaceous competition and to protect the plants against damage by deer or other animals.
- If necessary you may then prune to either form a stalk, or on the contrary to achieve a round and ball shape.

### ***Appeal to participation***

This work was made in partnership with the beekeepers of Languedoc-Roussillon; the plots of land are now more than ten years old, and an analysis of the results would now allow to confirm where it has been successful or where on the contrary lay its failures, all this to help us to learn and understand better.

We are interested in any further information that beekeepers may have for us, as well as comments and the other experiences that will help us to enlarge our knowledge base which will be useful to advance such projects.

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### **Some planting examples**



Photo 1. Plantation of sorbs intermingled with rural maples on agricultural fallow land. Maples, of smaller than sorbs, help the latter to grow a crown.



Photo 2. Here are the laburnums that flower from year 3, which accompany sorbs (in the centre of the photo): they take longer to grow but they will form the future afforestation and will flower in higher up.



Photo 3. This setting of a copse of wild cherries with wide spacing, pruned to form a straight trunk and without knot, future producer of quality wood, but also nectar, is associated with the pasture. The intercalary sowing of mellifloral plants is also a possibility of the agroforesters systems.

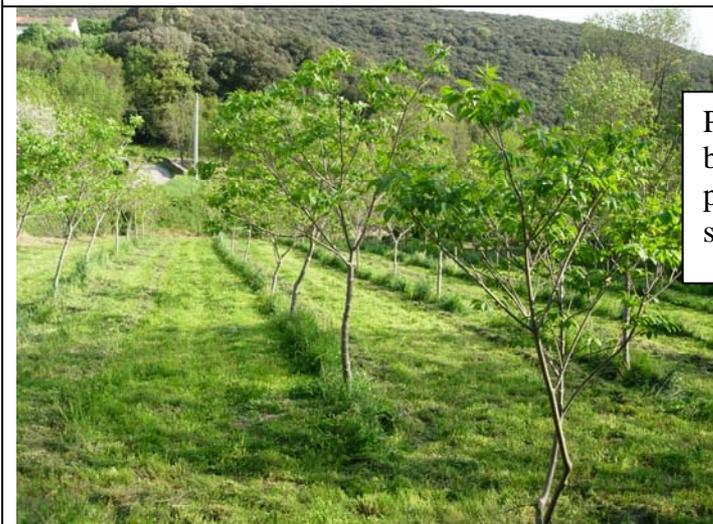


Photo 4. Plantation of a copse of Evodias by a professional beekeeper near his place of exploitation, the purpose a summer production and "shop window".

## Intérêt apicole et zones appropriées Pour quelques espèces forestières feuillus

Nom latin	Nom commun	Intérêt apicole	Nectar	Pollen	Miellat	floraison	ZB sec	ZB fertile	ZP sec	ZP fertile	ZM sec	ZM fertile
<i>Acer campestre</i>	Erable champêtre	xxx	x		x	Avr-mai		c	c	c		
<i>Acer monspelliensis</i>	Erable de Montpellier	xx	x		x	avr	c	c				
<i>Acer negundo</i>	Erable négundo	xx	x			avr		x		x		
<i>Acer opalus</i>	Erable à feuilles d'obier	xx	x		x	avr			x	x	x	x
<i>Acer platanoïdes</i>	Erable plane	xx	x	x	x	avr				x		x
<i>Acer pseudoplatanus</i>	Erable sycomore	xx	x	x	x	Avr-mai				x		x
<i>Acer rubrum</i>	Erable rouge	xx	x		x	avr						x
<i>Acer saccharinum</i>	Erable argenté	xx	x		x	Mars-avr						x
<i>Alnus incana</i>	Aulne blanc	xx		x		fev			x	x	x	x
<i>Amorpha fruticosa</i>	Amorpha	xx	x	x		Mai-jun	x	x	x	x		
<i>Arbutus unedo</i>	Arbousier	x	x	x		Oct-fev	a	x	a	x		
<i>Buxus sempervirens</i>	Buis	x	x	x		avr	x	x	x	x	x	
<i>Caragana arborescens</i>	Acacia de Sibérie	xx	x	x		avr	x	x	x	x	x	x
<i>Cercis siliquastrum</i>	Arbre de Judée	x	x	x		avr	x	x	x	x		
<i>Colutea arborescens</i>	Baguenaudier	x	x	x		avr	c	c				
<i>Corylus colurna</i>	Noisetier de Byzance	x		x		Fev-mars			x	x		
<i>Eucalyptus</i>	Eucalyptus	xxx	x			Mai-juilt	a	a	a	a		
<i>Evodia danielli</i>	Evodia, arbre à miel	xxx	x			Jun-août	x	x	x	x		
<i>Fraxinus ornus</i>	Frêne à fleurs	x	x	x		Mars-avr	x	x	x	x		
<i>Gleditschia triacanthos</i>	Févier d'Amérique	xx	x	x		mai		x		x		
<i>Koelreuteria paniculata</i>	Savonnier	xx	x			Jun-août	x	x	x	x		
<i>Laburnum alpinum</i>	Cytise des Alpes	x		x		Jun-juilt					x	x
<i>Laburnum anagyroïdes</i>	Cytise	x		x		Mai	c	c	c	c	c	c
<i>Morus alba</i>	Mûrier blanc	x	x			Avr-mai	x	x	x	x		x
<i>Morus nigra</i>	Mûrier noir	x	x			Jun	x	x	x	x	x	x
<i>Prunus cerasifera</i>	Prunier myrobolan	x	x	x		Fev-mars		x		x	x	x
<i>Prunus mahaleb</i>	Cerisier Ste Lucie	xx	x	x		Mars-avr	x	x	x	x		
<i>Prunus serotina</i>	Cerisier tardif	x	x			Mai	a	a	a	a		
<i>Pyrus communis</i>	Poirier commun	x	x	x		Mars-avr		x	x	x	x	x
<i>Robinia pseud. divers</i>	Robinier faux acacia	xxx	x	x	x	Avr-mai		x	x	x		
<i>Sophora japonica</i>	Sophora	xx	x			Juilt-août		x		x		
<i>Sorbus aria</i>	Alisier blanc	x	x			mai			c	c		
<i>Sorbus aucuparia</i>	Sorbier des oiseleurs	x	x			jun						x
<i>Sorbus domestica</i>	Cormier	x	x			Avr-mai	x	x	x	x	x	x
<i>Sorbus intermedia</i>	Sorbier intermédiaire	x		x		mai			x	x	x	x
<i>Sorbus torminalis</i>	Alisier torminal	x		x		mai				x		x
<i>Tilia cordata</i>	Tilleul à petites feuilles	xxx	x	x	x	jun				x		x
<i>Tilia henryana</i>	Tilleul de Henry	xxx	x	x		juilt	?	x	?	x		
<i>Tilia platyphyllos</i>	Tilleul à grandes feuilles	xxx	x	x	x	jun				c		c
<i>Tilia tomentosa</i>	Tilleul argenté	xxx	x	x	x	Jun-juilt		x	x	x		

ZB : Zone Basse méditerranéenne

ZP : Zone de Piémont

ZM : Zone de Montagne

a : sol acide uniquement

c : sol calcaire uniquement