

Hydroponics, what can you grow?

Arnica montana - Part One

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1996 – 2008, twelve years went by since we created GHE in Europe. Since then, we went a long way: today our products are known for their quality, and our technology is described as highly efficient, and ecologically sound. But people still keep asking: « what can you grow hydroponically ?»

At GHE we are plant lovers. Most of our existence we travelled looking for plants, we studied them, and we grew them. We are interested in food crops, of course, but we especially study medicinal plants, rare species, and high value crops. Since 1991, we grew around 360 different varieties in our greenhouses, 90% of them in hydroponics. The other day I went through my photo files. Plant photos taken in our greenhouses since August 1995. And I realized how valuable this collection is. I thought it might give me the opportunity to describe which plants can grow hydroponically, and to which purpose, by describing some of the most interesting ones that grew, or still grow, in our greenhouses.

My first choice goes to Arnica montana, as it brings together all the qualities we research in a plant: it is known since ancient times as a highly efficient medicinal plant, it is in increasing demand by the cosmetic, homeopathic, and pharmaceutical industries, it is difficult to grow in extensive agriculture, and it represents, if well managed, a high-value crop. Finally, it is an endangered species.

Arnica montana is a beautiful plant, with shiny yellow flowers in spring and summer, and a gorgeous flowering peak at summer solstice. It was first used in pagan times to attract strength, and protection from evil. The leaves were also smoked as “mountain tobacco”, though it is unclear whether this was for medicinal or religious reasons.

Arnica montana is a small hardy plant flowering between May and August, depending on its habitat. It has an incredibly strong and powerful root system that allows it to grow in the poorest soils. The whole plant is light green, covered with glandular fragrant hairs. It is easily identifiable by its longitudinal leaves and its 20 to 40 cm stems carrying beautiful orange-yellow flowers. The whole plant has a distinctive and pleasant fragrance. Several parts of the plant are used medicinally: the dried flowers (arnica flos), the fresh flowering herbal stem (Arnica herba), the whole plant fresh (Arnica planta tota), and the dried roots (Arnica radix).

Arnica is a major plant in traditional and modern European pharmacopoeia. It mainly contains sesquiterpene lactones, flavonoids, essential oils, and several other components, depending on the part of the plant you use. It is mainly applied to heal traumas, bruises, oedemas, muscular sprains, and articular pains. It is also used for heart complaints and to boost the immune system. It is anti-inflammatory. But beware! it is recommended to use it very diluted, and as a homeopathic medicine, because it is very potent and could be toxic if ingested internally, without medical control.

Arnica montana generally grows in the altitudes of Europe. Other varieties grow in European plains, in North America, and in Mexico. Always researched by healers, Arnica was gathered in the wild for ages. Of course, during our modern days, we gathered so many of it, and in such disorganized and disrespectful way, that we hardly find it anymore in nature. In some areas it totally disappeared, and arnica gathering in the wild is now under protection by law, as an endangered species.



Today scientists are looking for ways to farm Arnica montana in order to supply the growing demand, without depleting the wild. Indeed, in Europe only, we use 50 tons of dried flower heads (equivalent to 250 - 300 tons of fresh matter) per year, for an estimated 90 euros a kilo, and its price is rising very fast, due to its rarity. In the USA, there is a variety of arnica called Arnica chamissonis, which has very similar properties. Commercial crops of chamissonis are already at study there.

So we decided to grow Arnica montana in hydroponics, test the feasibility and therapeutic efficiency of a crop, and determine if hydroponics could be a viable alternative on a commercial scale. We started with a few plants, to learn how they grow and which diet they prefer. Our first results were satisfying, but we didn't have enough to analyse the content in active principles, as we always do with the medicinal plants we grow (see article on “hydroponics and medicinal plants” on eurohydro.com).



Collecting roots from live plants, allows to harvest without killing the plant.

What we discovered is that not only the plants grew beautiful, vigorous and very fragrant, but also we realized that we could harvest roots on live plants, without killing them, which is another precious contribution of hydroponics to this plant production process.

Our first tests were made with Flora Series, our 3 components nutrient, because it is a highly versatile and exhaustive plant food, which can be adapted to all plants, and to their different life cycles. With Flora Series we could control plant growth by providing it with the diet it needs, when and as it needs it. As Flora is a precisely crafted formula, we knew we could obtain a high quality crop with the best ratio of vitamins and mineral salts, free of heavy metals, therefore appropriate for medical treatment.

Arnica montana is known to like acidic, lime-free, well drained, soils, poor in phosphate and nitrate. It uses lots of silicic acid, which strengthens stems and leaves, and protects it from predators. Some growers say it likes a pH between 5.8 and 7.0, others say you shouldn't go beyond 5.0 or 5.5. We generally stay between 5.5 and 6.2.

Some writers say that all fertilizers are lethal for *arnica*. This is not what we experienced. In our tests, we apply our general, all plants, formula:

13 ml/10L of FloraGro, 8 ml/10L of FloraMicro, and 5 ml/10L of FloraBloom in the vegetative stage, and then the same amount of FloraGro and FloraMicro, but with 7 ml/10L of FloraBloom in the flowering stage. To this we add pure fulvic acid (Diamond Nectar) and our organic root activator (BioRoots) now and then to improve food intake and assimilation, and increase the development of its naturally strong root system.

Finally we add powder silicate (Mineral Magic), to provide the much needed silicic acid. *Arnica montana* grew steadily in our Dutch Pots Systems. It was healthy and vigorous, with hardly any problems to talk about. It propagated extremely well, mainly by division.

We had read that *arnica* is susceptible to a few diseases and predators. Among them an oidium called "*Sphaerotheca fuliginea*" which attacks the leaves from spring to fall (but doesn't seem to affect the plants too much), and a pathogen called "*Entyloma arnicalis*" which wounds the leaves, and delays, or sometimes stops, the plant's development. As for the predators, the most harmful is one called "*Tephritis arnicae*" which lays its eggs in the buds and reduces their development. Up to now we only experienced the usual mealy bugs and white flies, which we promptly treat with integrated pest management.

Our tests are still on, and this year we'll dedicate 2 large Dutch Pot "Aero" systems, to cultivate the equivalent of a small commercial crop: one will be grown with Flora Series (mineral), and another with BioSevia (certified organic). Both crops will be analyzed of course. If the content in active principles is as high as with the other crops we already grew and tested, we will have another winner to offer new farmers who want an alternative to traditional products, and growing methods. This will provide them with higher yields and a good quality, high value crop, while using much less nutrients, but also much less water, which is today an essential parameter in our water scarce planet.

Practicians and patients seem to prefer wild plants to cultivated ones. They think they are more efficient, and they may be right, as several tests growing *Arnica montana* show a loss of therapeutic effects. So our work will be not only to grow them, but also to do it in such a way as not to lose any efficiency. Up to now, the medicinal plants we grew with our products show twice, sometimes three times as much active principles as the controls in soil, more vitamins and mineral salts, and no trace of heavy metals. So we might be able to overcome this very essential issue. In case we do, and we'll know this in a few months, we will be able to add *Arnica montana* to the list of potential hydroponically grown commercial crops we selected over the years. If it is not as potent and rich as it should, we will try *Arnica chamissonis*. This variety is considered by the European pharmacopoeia as therapeutically equivalent to *Arnica montana*.

Like many medicinal plants, *Arnica* can be dangerous. If you decided to grow it, it is important to know that this is a potent plant. It may be toxic not only when you take it internally, but also when you handle it on a long-term basis (harvesting, shipping, processing). It is for good reason that in the old ages, it was called Wolf's Bane "who overcomes the power of wolves", and was used in shamanic ceremonies to bestow power, audacity, bravery, and the gods' protection! For more information on our tests, please don't hesitate to contact us at info@eurohydro.com.

