

Alpino-Permaculture at Arvillard, France

Our Family

Bienvenue, Welcome to Arvillard in the Savoie.

We live in a **small French village** of nearly 900 people situated in the heart of the **Alps** in the **Savoie**, a south east region of France. It is perched at an **altitude** of **500m** on the crystalline rock slopes of the **northern hills** of the **Belladonna mountain chain**. Here, both for our own **needs** and for **barter** and **trade**, our family farm “the **Tyon Koute**” produces:

- vegetables, herbs and medicinal **plants** (see *photos below right*);
- seeded and stone **fruits**,
- **hay**,
- **wood** for heating and crafted braided objects

We use traditional methods, and practices of the former **Alpino-permaculture**, passed down to us.

We have a **wilderness** area as part of our farm which we have voluntarily chosen to leave to develop naturally - it needs regular care too.

Our family is two parents and four children, from 8 to 15 years old, and, as well, as one very active cat. As **parents**, we prepare and **work** on the cultivated, hay and timber production areas. My particular interest is in aromatic plants (trees, shrubs and herbs). Our **children help** us in planting and harvesting fruits and vegetables. They participate occasionally in transformation and conservation work, and always in



eating produce! Friends, colleagues and interested **people** also come to our farm to give us a hand.

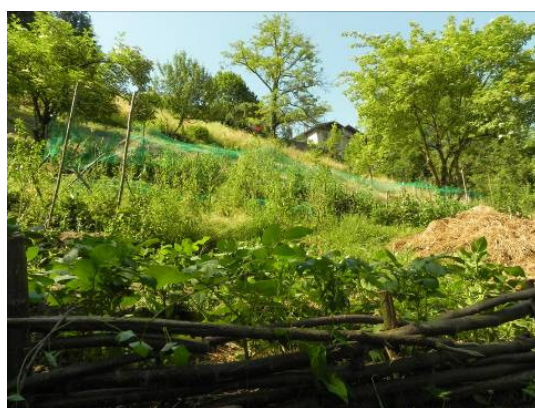
Our Farm

Our family farm is called a '**Koute**' in the local provincial Savoyan-French dialect, so our farm is known as the «Tyon Koute». The total area of its plots of land, near the slope of Mt Pezard, is about **9000 sq m**. This is an **average sized** single holding in the Savoie.

As a part of Savoie's '**collineen**' [**lowland hillslope**] landscape, our land is **flat** on the **top** of the farm for 30m (where the house and vegetable garden are) *as seen in the top photo and the background of the photo right*. Our Koute's slopes all **face south south east**. It drops very steeply for 20 m (over 50% gradient) *as seen in the middle ground of the photos right and below*. This **steep slope** limits our access, what materials we can bring in, and what we do in farming. Then a **gentle gradient** returns for 35 m (<15 % gradient) to reach a (poorly marked) **country path** for lowly **muledrivers**.

The local **geomorphology** is based on marled limestone (a type of a friable **sedimentary** rock). It was deeply cut into during the retreat of the last local glaciers through the **Bens Valley** and the **Arc Valley** through the **Cucheron Pass** further away to the north. The **fluvio-glacial** deposits are obvious in the upper terrace by the presence of thick beds of sands and pebbles, within **very fertile silty** slopes of **colluvium** on our hill sides. [Colluvium is loose material dropped at the bottom of a slope]. The bottom of the valley is a **damp gravelly clay**.

In our broader area, the hill at **Mount Pezard** is part of the **frontier hills** along a crystalline Alpine massif,



of the **Belledonna chain**. It classically runs parallel to the other pre-alpine foothills (Chartreuse, Bagues and Vercors). A 3D plan is at <http://www.geol-alp.com/belledonne/lieux/SeptLaux/laRochette.html>

The local **climate** has three **influences**:

- **Sub-mediterranean** – following along the axis of the Belladonna Chain,
- **Sub-continental** – brought by easterly and northerly winds circling in from Europe,
- **Oceanic** – from the westerly winds coming from across the Atlantic.

Their **meeting point** here has a clear influence on the development of vegetation and plantations throughout the year:

- **Winter** is generally **cold** and **dry**, with precipitation as **snow**
- **Spring** **mild** and humid (with the most rain) - *e.g. see the photos on the previous page*
- **Summer** **hot** and **humid**,
- **Autumn** **cool** and **dry**.

One can thus till the earth in Winter, plant the vegetables at the beginning of April-May and harvest regularly up to the end of September.

In our mountainous environs, some dramatic climatic events regularly impact on our production (**hail, storm, intense rain, late or early snow, drought**).

See http://srcae.rhonealpes.fr/static/cms_page_media/24/rapport-climat-final.pdf



After a time for observing and testing, it seemed natural and appropriate to us to adapt our farming methods to our slope, soil type, local climate and the following biotic elements:

- **Before World War II** (1939-1945), our land was used for **farming and timber** production for over a thousand years (under the Hallstadt [8-6 BC] then Allobrogie [2BC] civilisations).
 - This **hillside** had had a reputation for:
 - quality **fruit** production (apricots, nectarines, loquats, apples, pears, prunes, nuts, etc),
 - and especially **vines** on the parts with the steepest and sunniest slopes,
 - the highest quality **hay**,
 - and **gardens** at the top and bottom of the slope.
 - Some parts near the river springs had been dedicated for **grazing** (cows, goats and sheep, horses).
- This **declined** rapidly until the **1980's** when:
 - all **farming** on these plots had **gone** (due to the rural exodus and progressive disappearance of the farming population).
 - **Brambles**, then **groves**, and finally the **forest** took back the meadows of hay and grasses (*see photo right*).
 - The **orchards** and **vineyards** disappeared.



- There was **natural recolonization** by:

- endemic plants adapted to our local climate (ash, sessile oak, Downy Oak, Hornbeam (Charme), maple, walnut, brambles, white willow, Stonecrops (sedum), hops etc.)
- And by **accompanying animals** (fox (see *photo bottom of page 3*), badger, red elk, chevreuil deer, squirrel, hedgehog etc.)

It has hidden the evidence of the formerly cultivated areas and reduced local biodiversity.



In the last 5 years, we have undertaken a **gradual reopening and restoration** by clearing trees, culling animals, mowing and planting while respecting and benefitting from this mosaic of natural habitats

The **natural environments** present on site are:

- Groves and shrub thickets dominated by walnut, ash, willow, plum (*see photos right*)
- Dry and extremely hygrosopic [absorbs moisture from the air] **meadows** on the collineen hillslope landscape
- **forest** dominated by oak-ash-maple
- **Rose- hip Briars**
- Remnants of **orchard trees** (dying apple tree, plum, pear, chestnut tree (Castanea sativa), walnut trees on the decline, elderberry etc.)
- Remnants of **viticulture** (an uncut vine, acacia stakes, Pokeweed etc.)
- one natural uncapped **spring** and one **wetland downstream**
- **Rupicoles** [plants which like to live on low dry-stone walls]



To wisely balance the needs of our family for the next 20 years with the issues for improvements /preservation for the biological and pollination corridors, we have opted for the following **land use division**:

- 1/3 for **vegetable, fruit, herb and hay** production
- 1/3 for **forest and shrub** development and production
- 1/3 for **natural space** (see <http://en.wikipedia.org/wiki/Wilderness>)

In order to **prepare our land**, we have put in place some necessary **manual works** for:

- **Improving access** (*see photo right*) from above - we had no driveway in the beginning.
- Making **farming zones** for
 - **Selective cutting** of trees
 - **Clearing** brush



- **'dogging'** [scratching a hard surface to open it up for water and seed germination] for bramble bulbs
- **manual terrassing** into into small benches
- **mechanical stabilisation** works (fascines [fortifications made with bound bundles of long sticks *see photo right*], clay bricks, natural cuttings of willow ash, hazelnut, Rose-hip Briar),
- the restoration and creation of the **low dry-stone wall**
- carefully **removing old** zones of tree **plantations and vineyards** to allow the wild regrowth to be root-stock
- **manually mowing** and regenerating a part of the former meadows
- preparing **cépées** [Tuft of several stems of wood which emerge from a stump] of the walnuts/ash and 'tadpole willows'
- restoring **access** to and the periphery of, the spring (*photo right*) - in progress
- **preserving the pathways**, biotypes of **local species**, and the hunting, resting and breeding grounds of wild animals.



Our produce - 'Feeding the world' by 'Feeding our selves'

We **produce most of our family's needs** for plant fibres (and sugars) from our fruit trees, vegetables, herbs and medicinal plants in our Tyon Koute garden. Below is a list of our main food produce. Many have several varieties(*):

- **Fruits:** Angelica, Apples*, Black Elderberry, Blackberries, Blackthorn, Cherries, Currants*, (Eglantine) Rosehips, Figs*, Grapes*, Hazelnuts, Jostaberry, Kiwifruit, Medlars, Nuts, Peaches* (*front box in photo right, Vine Peach in left photo next page*), Pears* (*back box in photo right*), Prunes*, Quince, Rhubarb and Strawberries*
- **Vegetables:** Arugula, Italian cress, Beans* (*photo far right*), Bette (Chard), Blette (Chard), Carrots*, Cauliflower* (*Milan Cauliflower in middle photo next page*), Cucumber*, Garlic*, Leek*, Marrow*, Onion*, Peas*, Pepper*, Red Beet, Salad*, Sorrel*, Spinach*, Sweet Potato*, Tomatoes* and Zucchini*



- **Herbs and Medicinal Plants** (*Dried plants shown in photo below right*) : Ash, Burl*, Chamomile*, Curry & Carum carraw, Elderberry, Garlic, Garlic of the bears, Genepi, Horsetails*, Lavender*, Linden, Meadowsweet Calendula, Melissa Melitta Mint*, Mint*, Nettle*, Oregano, Marjoram, Rue (herb of grace) & Tansy & Mustard, Sage*, Wormwood / Sage bush*, Savory*, Tarragon* and Verbena*



Our **produce** is **shared** between our family, friends, colleagues, and our mountain co-operative development working associations. We especially want to ensure the **very best quality** of the foods (fruits, jams, vegetables, spices, canned) and produce connected to our garden (hay, woven basket crafts, wooden objects and tools).

At **local organizations**, there are times when we **exchange** plants, cuttings and grafts, cultivation techniques and instructions on how to do material or mechanical adaptations.

Sustainability - 'Taking care of our earth!'

Observe natural surroundings, adapt to our climate!

Since our arrival 15 years ago, we have observed that our **local micro-climate** is strongly influenced by its **geographical landscape** in front of the **Belladonna Massif** and in the **valley of Bens**, at the foot of **Mount Pezard**. In 2013, France's Bureau of Meteorology suggested that we install an official geographically referenced station to record more accurately our variations (temperature °C min/max, cloudiness, precipitation, snow load, dew, frost, cloud cover, lightning, etc) and to contribute to meteorological forecasts as well as the **intra-alpine climate** analysis.



Over these 15 years, in systematically comparing our readings with those of the former mountain operators, we have noted **several trends**:

1. a strong momentum of **vegetation to close open spaces**
2. a variable **lag in seasons**

3. a rise in the frequency of **extreme meteorological events** (frost, storms, drought, absence of marked winter, winds, intense rainfall, etc)
4. the visible **rising altitude** of the forest species on Belladonna
5. the average **rise of the daily range of temperature** (min /max)
6. the adaptation and climatic **expansion of sub-Mediterranean or exogenous plants**

We also record **remarkable natural occurrences**: budding, low-water level at the spring, first frost, first snow, dense insect clouds, paths and arrivals of birds and so on, all affected by our climate. We have noticed a **net decrease in number and variety of insects** with a consequence on the presence of some species of **birds** (notably the swallows) and on the quality of **pollination**.



On this basis, we **watch and adapt our plantings** by our experiences in the short, medium and long terms. The **reaction of plants to our soils, methods of cultivation and climate** provides good guidance to make our production more reliable.



With regard to our **very permeable soils** and, following repeated and intense periods of drought, we have put in place **water savings** to manage our resource (including cultivation, choice of species and plants, collecting rainwater, gravity transfer, clay soil conditioning, etc).

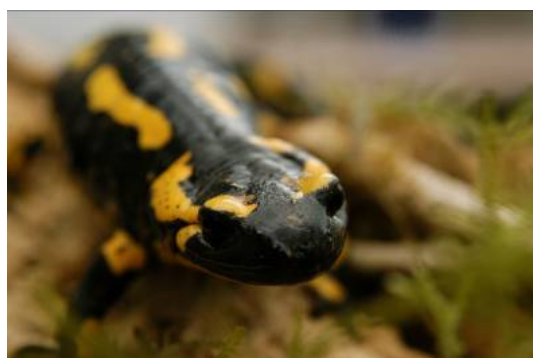


Preserving our biodiversity

In becoming an integral part of the **very wild Valley of Bens** biotope, we **promote** the improvement of **biodiversity** on our site while maintaining a **sustainable** aim for our **farming** by several principles and simple measures:

1. Promoting the **variety of species** (see the list of main species in the appendix), their natural **habitat** (<http://inpn.mnhn.fr/programme/referentiels-habitats>) and their continuity in the form of local **biological corridors** (for cerf or hart deer, chevreuil or roebuck deer, foxes, badgers, weasels, Martens, insects, butterflies, birds, etc),

2. Experimenting with **plant adaptations** over several years and bringing back species dormant in the soil in the form of patches and micro habitats,
3. Selecting and integrating **indigenous or endemic mid-altitude and mountain species** in our bio-geographical area (seeds of grasses, sedges, flowers, cuttings of shrubs, etc)
4. **Manually cutting the meadows** (*see photos right*) has no sound impact. It secures the best seed production. It best respects insect life in its development stages and the limits for drying and conditioning hay.
5. **Mechanical stabilization with plant-based construction** (using wattle fencing, brushwood pavements, cuttings, rollers, etc),
6. Maintaining and creating **wildlife shelters**:
 - a. protecting **logs** for Hedgehogs near our vegetable gardens
 - b. Dormouse and Voles in the **thickets and Brambles**
 - c. **Bird boxes** and shelters, (*photos p 10*)
 - d. Maintenance of the **variety of vegetation layers** for the installation and passage of the birdlife (Heron, Jay, Raven, birds of prey (*photo page 10*) , etc) by planned cuttings,
 - e. **Burrows** for Fox and Badger under the hazelnut trees,
 - f. **Sleeping and calving beaches** in the groves for does and fawns, chevreuil or roebuck deer,
 - g. Wild boar in the **spring's wet valley side**
 - h. grass snakes and lizards (*photos right and above right*) in our **lower and upper walls**
7. Our **flowering meadows** (*bottom photo*), garden edges and pathways where we observe and improve pollination
8. Maintaining **plant species** especially needed by **dependent animal species** (insects (*photos page 7*), butterflies (*photos page 9*), spiders, etc),
9. **Cleaning the surroundings of the springs** and stream for better access and to prevent possible pollution,



We keep watch on the **fragile balance between food production and important wildlife** through several practices:

a. **mechanical protection** of productive areas (trampling, uprooting, etc) by:

- i. Plantations of **rose hip cuttings**,
- ii. natural regeneration of the rows of **Brambles**,
- iii. light nets over **vegetables** (beans, Swiss chard, peas, etc), (see photos right)
- iv. covering **fruit tree branches** with brambles and light nets
- v. an interlocking picket **fence plant barrier** (strawberries, raspberries, etc),



b. On chosen paths, planting **attractive and repellent plants** (sorrel, rhubarb, tansy, common rue, succulent grasses, young shoots of ash, hazelnut, etc)

c Guiding our squash, zucchini and spinach plants to **climb** on hedgerows and high groves.

d **Pruning** brambles, trees and fruit bushes to fit our paths and those of the animals

We are interested and participate, on a voluntary basis as much as possible, in many **cultural and scientific monitoring and environmental teaching skills networks**, like:

- The National Museum of Natural History: <http://www.mnhn.fr/fr>
- The League of Protection of birds for their habitats, information collection and monitoring of wild birds operations: <http://www.lpo.fr/>
- The EIPC-CENS Savoie network for natural world observations SERENA: <http://www.cen-savoie.org/>
- The Tela-botanica network for Botany, plant biology and applied phytosociology network: <http://www.tela-botanica.org/site:accueil>
- The Noé Conservation Network / MNHN / observing Nature for night insects: <http://www.noeconservation.org/>
- The network of astronomy ANPCEN / AFA on the quality and the pollution of the night sky: http://www.anpcen.fr/?id_rub=11
- The reporting of the Ambrosia of the Regional Health Agency Network: <http://www.signalement-ambroisie.fr/>
- Network and information dissemination from B. Veler, Alpine geographer: <http://spatioblog.wordpress.com/>
- The protection of bees and other pollinators and action network: <http://www.pollinis.org/>
- The Meteorological network of France for the collection of standardised data on local climates: <http://www.meteofrance.fr/climat-passe-et-futur;jsessionid=B044DD45963DF115C8E2681C54639800.12>
- The botanical and mycologique (mushrooms) network SMBDS & Montmelian Rural Group for research and teaching: http://www.foyersruraldemontmelian.fr/bureau_41.php & <http://fmbds.org/>
- The FRAPNA network for teaching and environmental protection : <http://www.frapna.org/>
- The SISMALP network for anthropogenic indicators of seismic activity in the alps: <http://www.franceseisme.fr/alertes-fr.php>
- The Naturalite and Ash Tree, waters and forests network: <http://www.naturalite2013.fr/>
- The AGEBIO network for biologic engineering: <http://www.agebio.org/>



Let's watch over our natural foot print

Alpino-Permaculture

Our farming method, combining **permaculture and traditional mountain agriculture**, allows a realistic adaptation to our environment. As we go along, we are learning **good methods**, like the use of **specific hand tools**, and gradually adapting certain **productive plant species** from native and especially endemic species. Our many **failures and tests** are thus generators of new ideas, modifications and passionate discussions with our mentors!

Timing of harvest, pickings (*eg bottom photo right*), graftings, cuttings, plantings, putting in gauges, mowings, pruning and care of trees and shrubs, all follow the immutable and natural order of the seasons. After hand mowing season, we go gathering in the surrounding hills and mountains.

The mixture of annual and perennial grasses, sedges and wildflowers all release their seeds. These naturally increase the biodiversity of our meadows. They also add feed value for the faunal biodiversity living on the low wall edges, like insects, spiders, birds, and small mammals.

Compost and Manures

Organic waste from our family (bones, vegetable oils, meal scraps, chips from leaves and branches, nuts and pips, mown grass clippings and flower trimmings, etc) is recycled well into making **good quality compost** destined for the upper vegetable garden.

Manure from sheep, goats, and horses (come to us **from local farms**) and **woodchips** are an effective annual revitalisation of soil. Nettle, comfrey, ash, the remains of garlic cloves, onions, decomposing wood and so on help us to **naturally fertilize and protect** our cultivated land.



Living simply

We **do not use** and therefore don't buy phytosanitary [**pesticide**] products that could negatively affect our biotope and our own health. We **limit** as much as possible the use of **machines** from other works (tractor, tiller, shredder, etc) in order to not propagate certain **pests** or **invasive plants** (Lady of Japan, Ambrosia, phytolacca, amaranth, etc) and to not break down the **soil's biologic complexity** (microfauna, insects, fungi, etc).

Family Mindset

For us, a small family of the Alps, the "**Garden of the Tyon Koute**" is essential for:

- Securing a large part of our **food needs** and depending less on certain agro-food sectors that we do not support
- Eating **quality foods** (*eg our potato harvest in photo right*) and looking after our health,
- Awakening or **sharpening our senses** in our nearby environment teeming with life
- Working in an **ethical context** for solidarity and companionship,
- Passing **simple values** to our children (*photo right*) about taste, sharing, usefulness, rhythm and cycling of the seasons, plantation produce and innate nature,
- Learning, experimenting and improving our alpino-permaculture farming practices to **respect nature**,
- **Balancing our activities** with the functioning of our biotope and its natural habitats,
- Improving by identifying and monitoring, **scientific and personal knowledge** of climate, surroundings, species, habitats, resources and their evolution in time,
- contemplating the real features in **our landscape in the Earth's history**.



Crépuscule - Dawn

Being aware of **our good fortune** to be able to farm a rich, while highly restrictive, mountain landscape, we **share** as much as possible **common sense practices** with our children, friends, neighbors, colleagues and curious people, under **a simple principle of unity between humanity and biodiversity, especially recognising true common benefits**".

APPENDICES –

characteristic genus and species to our Tyon Koute lowland hillslope garden farm site

App 1 - PLANT SPECIES

Agrimony Amaranth * Angelic
and almost Arum in Italy Ash
Aspen * Aster *
Bellflower * Benoîte * Birch *
Borage Boucage saxifrage
Buckwheat * Burdock Burl *
Buttercup *
Calendula officinalis, Capillary *,
Carpinus betulus, Celandine,
Charcoal, Cherry, Cherry *,
Chestnut, Chickweed *,
Circe of paris, Climbing ivy,
Crabgrass, Cutter bar *.
Dogwood, Dogwood male,
Elm *, Equisetum Arvense,
Equisetum hyemale, Euphorbia*.
Fern *, Fumaria *,
Gada *, Galeopsis *, Galinsoga,
Geranium *, Giant Hogweed to
close, Goosefoot *, Grapes of
America (inv),
Grass *, Great horsetail, Ground
Ivy,
Hazel, Heart leaf Linden,
Hellebore *, Holly, Hops,
Horehound, Horseradish
Impatience *, IRIS *,
Jerusalem artichoke,
Knautia,
Manna *, Maple *, Medlar,
Myosotis *,
Nightshade *.
Oak *, Orchidaceae *, Orchids *,
Oxalis *
Perce snow, Phragmites,
Plantain *, Plum *, Poplar *.
Queen of nearly, Quince,
Robinia false acacia, Rose hips,
Royal Walnut, Rumex *.
Sage *, Wormwood/Sagebrush *,
Saponaria, Scots purple, Seal of
Salomon, Sedge *, Sedum *,
Silene *,
Small red starthistle, Spring
snowflake, Stachys *,
Teucrium *, Thistle & Cirsium,
Twisted *
Vetch & pea, Viburnum *.
Wild Apple, Wild carrot, Wild
Pear, Wild strawberry, Willow *,
Yarrow

1 Plant Species

2 Animal Species

3 Fungi Species

(4 Garden species are listed on pp5-6 under fruits, vegetables, and herbs)

App 2- ANIMAL SPECIES

Angel wing, Asian Hornet (inv),
Badger dog-nosed, Bank Vole, Bat *,
Bee *, Black kite, Bullfinch,
Butterfly *.
Campagnole, Carabid *, Carpenter
bee, Chouette hulotte, Common
buzzard, Common cockchafer,
Common toad,
Cricket *, Cuckoo
Dragonfly *.
European deer,
Fouine
Golden Eagle, Grasshopper *, Great
Green grasshopper, Great spotted
Woodpecker, Green and yellow
snake,
Green Lizard, Green woodpecker
Hedgehog, Heron, Hermann's
Tortoise
Jay
Kite lucane
Lampyre and Firefly *, Lesser
spotted Woodpecker, Listera *,
Lizard
Magpie, Mantis, Marten, Martinet,
Merle
Nuthatch torchepot
Owl, Owlet
Pinson*,
Rat of the fields, Rat tamminana,
Red Deer, Red Fox, Red squirrel,
Ringneck snake, Robin *.
Scorpion fly, Siskins, Sparrow *,
Swallow
Tit*.
Verdier, Viper aspic
Wasp*, Wild boar, Wolf grey, Wren

App 3 - FUNGI

Agaric *.
Boletus and cepe *.
Consistent *.
Coprin *, Cortinarius *,
Cortinarius *, Coulemelle *.
Lichen *.
Morel *, Mycenae *.
Parmelia *, Pholiota *.
Russula *.
Scleroderma *.
Vasudevan *.

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For more Family Farm snapshots visit <http://familyfarms.enviroed4all.com.au/>

For official IYFF websites, visit : <http://www.fao.org/family-farming-2014/> <http://www.familyfarmingcampaign.net>

For more information on Koute a Tyon visit <https://www.linkedin.com/in/geotope>

For communication with, and visits to, the Koute a Tyon contact: geotope@orange.fr

