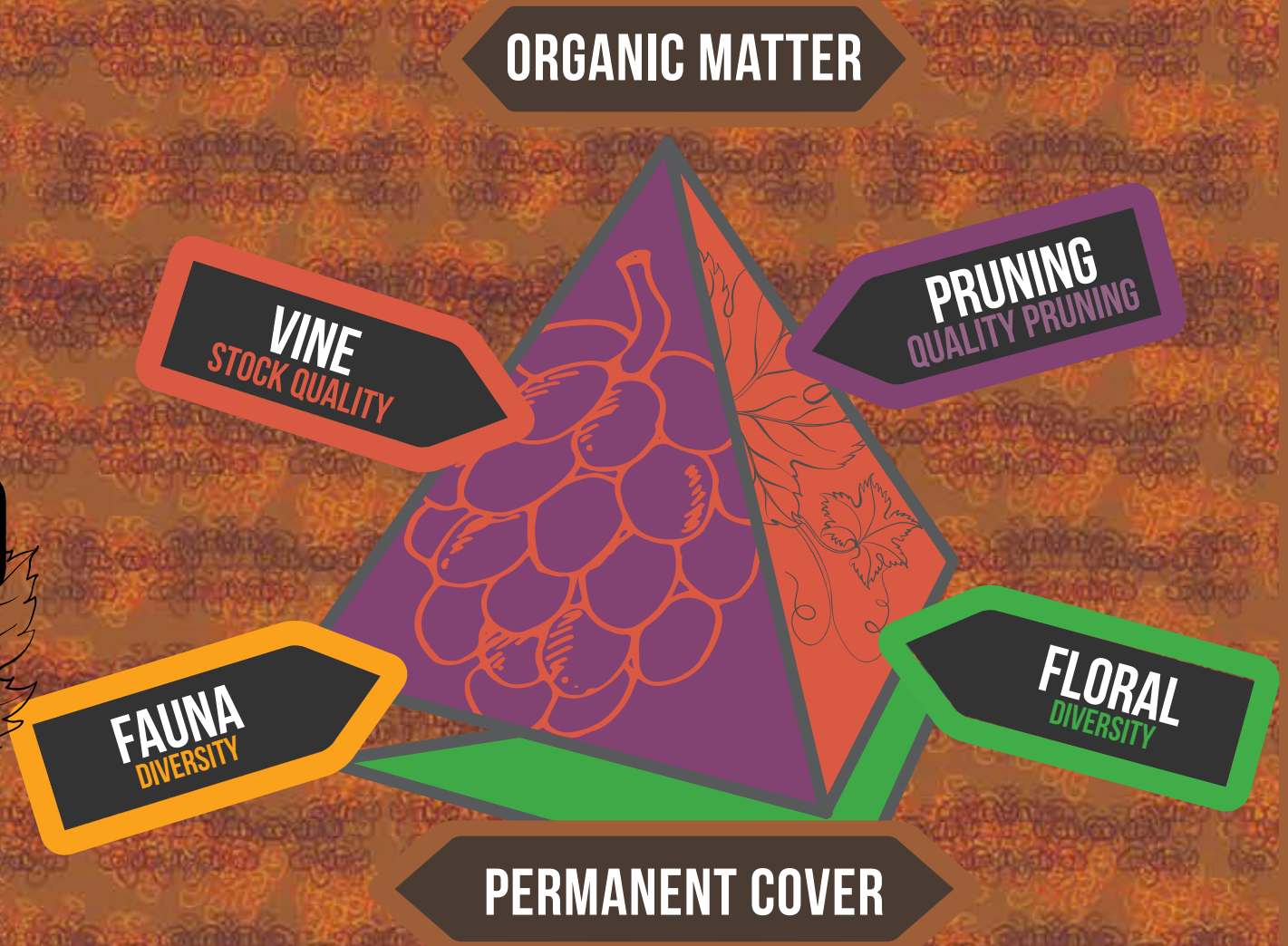
IPM THE HOLISTIC VINE PYRAMID



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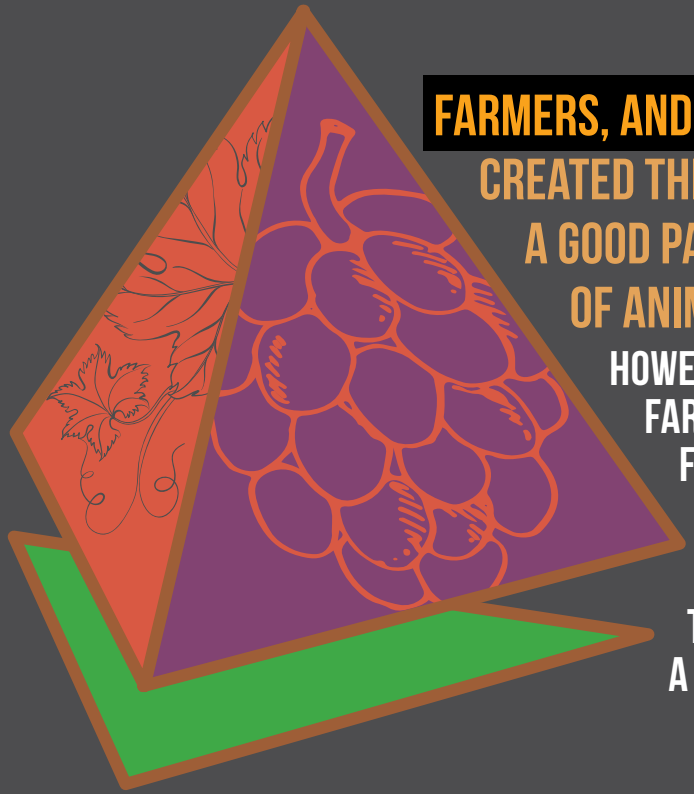


FARMERS, AND MORE SPECIFICALLY VITI-CULTURISTS, HAVE CREATED THE COUNTRYSIDE'S BIODIVERSITY AND WITHIN THAT A GOOD PART OF AGRICULTURAL BIODIVERSITY BOTH IN TERMS OF ANIMALS AND PLANTS.

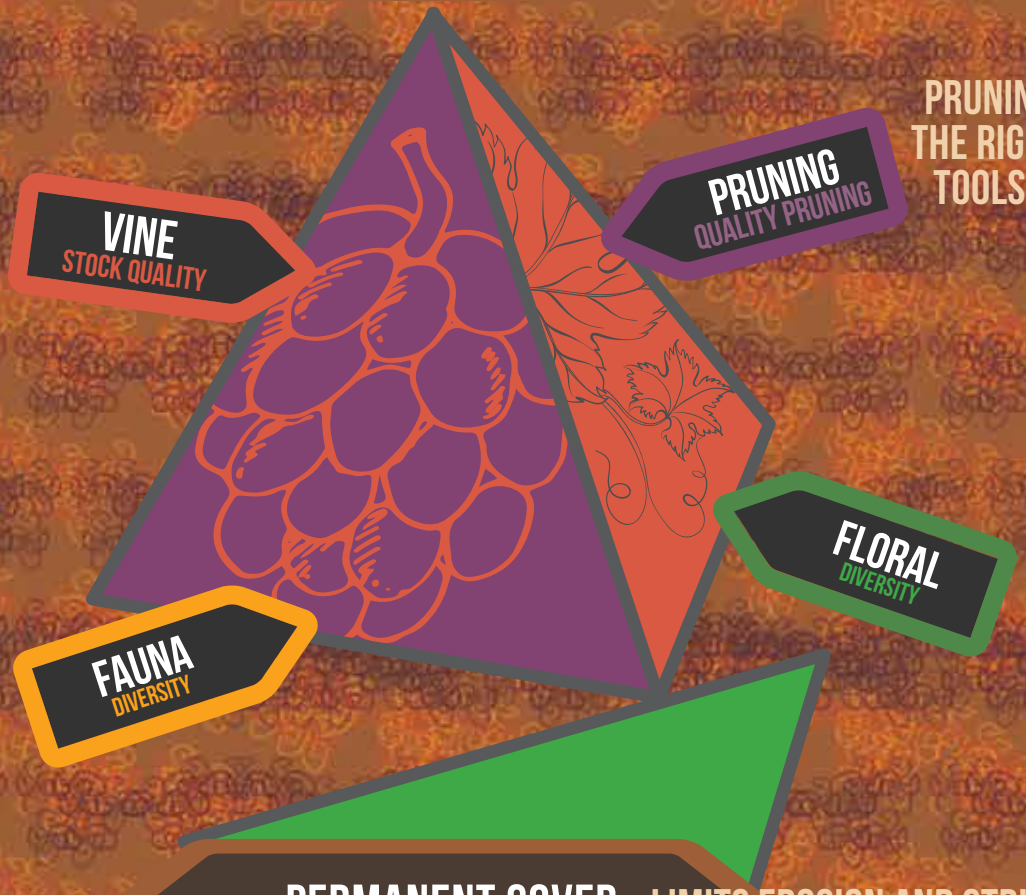
HOWEVER, THE CURRENT GENERAL TREND IS TO USE MONOCULTURE FARMING TO GROW VINES. THIS IS PRODUCING ALL THE VULNERABILITIES FOUND IN A SINGLE SPECIES ECOSYSTEM.

ANY CHANGE REQUIRES SCIENCE AND PATIENCE. THE CHALLENGE IS TO COMBINE INNOVATIVE VITICULTURAL PRACTICES WHICH RESPECT THE ENVIRONMENT AND ARE BASED ON ANCESTRAL PRACTICES WITH A BUSINESS THAT IS FAIR AND ECONOMICALLY VIABLE.

ORGANIC MATTER IS ENERGY FROM THE SOIL – 4

WHEN CHOOSING VINE STOCK, THE GROUND, CLIMATE AND RISK OF DISEASE MUST BE TAKEN INTO ACCOUNT – 9

PRUNING MUST BE CARRIED OUT AT THE RIGHT TIME WITH THE CORRECT TOOLS TO PREVENT UNNECESSARY DAMAGE TO THE PLANT – 5



DIVERSIFIED FAUNA CAN LIMIT THE RISK OF PESTS. THE FAUNA UNDERGROUND WORKS TO NOURISH AND STRUCTURE THE SOIL – 8

FLORAL DIVERSITY HELPS FEED BENEFICIAL ORGANISMS. TREES OFFER PROTECTION FOR THE VINES NOT ONLY FROM PESTS BUT ALSO ADVERSE WEATHER – 6

PERMANENT COVER LIMITS EROSION AND STRUCTURES THE SOIL – 7

ORGANIC MATTER

ORGANIC MATTER IS AT THE HEART OF FERTILE SOIL

It can be divided into three broad overlapping categories depending on its level of decomposition:

- Living organic matter (Earth worms, small mammals, insect larvae, nematodes, protozoa, algae, fungi, bacteria, etc.) in other words, biological activity which has an effects soil porosity, enriches assimilable minerals, stimulates microbial flora, breaks down cellulose and lignin, and helps nitrogen fixation.
- Raw organic material In other words detritus, the decomposition of living organisms which is the energetic reserve of the soil's inhabitants and the base for humus.
- Humus A complex substance "rebuilt" from organic matter and mineral materials which enable soil cohesion, crushing resistance, management of water and nutritional elements.

Some ways to increase biomass and soil life, and therefore the amount of humus include: spreading manure or RCW (ramial chipped wood), planting permanent and/or temporary plant cover, crushing the vine shoots, planting trees, working the soil less, decreasing copper content in the soil and avoiding the use of crop protection products.

Maintenance refers to everything relating to the vine's health from its beginnings to the harvest. Those looking after the vines need to have received rigorous training.

Planting carried out within the rules of the art (well-prepared land, correctly timed planting, etc.) facilitates regrowth and its future potential.

Cleaning the vines without damaging it through the use of tools or machines respects its integrity and protects it from pests or disease.

Proper pruning enables fluid circulation of the sap and a back-up of nutrients in flowering vines which can protect them against both health and climatic hazards.

FAUNA DIVERSITY

There must be biodiversity within the vines but also across the whole vineyard. Biodiversity is evidenced by the diversity of both flora and fauna species, the diversity of habitats and ecosystems, and the genetic diversity of the vines themselves.

For nature, biodiversity is a strategy to ensure its longevity. Getting inspiration from it becomes evident. From the soil's micro-organisms (bacteria, fungi, nematodes, etc.) to the trees (whether in isolation or as part of a hedgerow), they all contribute to the needs of biodiversity which has numerous advantages:

- A direct resource: for food but also for the gene pool, matter and molecules necessary for the development of future varieties.
- A buffer against atmospheric disturbances: storms, hail, floods, drought, etc.
- Protection for soil, air and water resources: protection against erosion, a filter of pollutants
- A recycling factory for the elements: carbon, potassium, nitrogen, etc.
- An invaluable aid to pollinisation: even though vines are essentially wind pollinated, the presence of bees can increase grape production.

PERMANENT COVER

OPTIMAL GROUND COVER

Vines only cover part of the land in a vineyard. Good ground cover between rows enables:

- Soil protection
- Preservation and improvement of soil structure
- Management of fertilisation and water
- Avoidance of crop protection products

One of the challenges is balancing the competition between ground cover and the vines in order to harness all of the agricultural and ecological advantages.

Temporary plant ground cover is a good compromise. The right choice will produce large quantities of biomass which will colonise not only the surface but also permeate down through the soil. It will be easy to remove the ground cover to avoid competition and to regularly change the mix of seeds according to the needs of the vines and the soil.

FAUNA
DIVERSITY

MONITORING

There are more and more surveillance networks which provide the opportunity for live monitoring.

Quick reactions and anticipating problems allow viticulturists to be pro-active and resilient. This can be achieved by working together with their colleagues in the same area to install instruments to measure and observe the vines.

A few examples: precise weather readings, comprehensive and/or visual soil analysis, a network of pest traps in order to assess the magnitude of the problem, regular inventories of the flora and fauna, sight recognition of the main insects, fungi and plants that have an impact whether negative or positive on the vines.

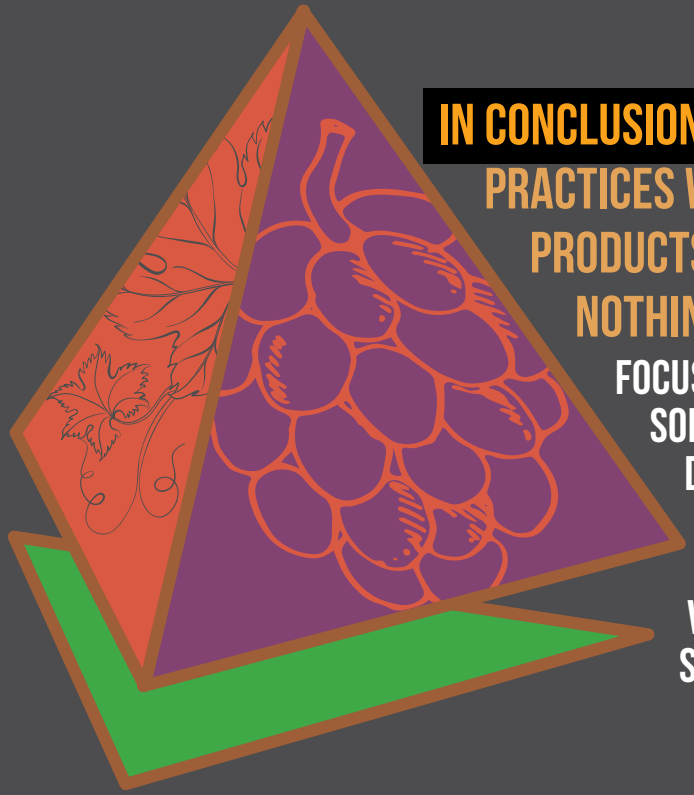
VINE
STOCK QUALITY

CHOICE OF VINES

The vast majority of vines are grown on rootstock clones with laboratory cultivated scions and reproduced by nursery owners.

If correctly done and adapted to the vineyard such combinations definitely provide added value.

However, the benefits of "rooted" vines should not be neglected: cutting adapted to the land which took the time to take root before being grafted as well as the ungrafted ones that do not need to be grafted and thus avoid the scar between the rootstock and its graft.



IN CONCLUSION, IT IS IMPORTANT TO DEVELOP VITICULTURAL PRACTICES WHICH ELIMINATE THE USE OF CROP PROTECTION PRODUCTS AND OTHER TEMPORARY CRUTCHES WHICH ARE NOTHING MORE THAN A HEADLONG RUSH FORWARD.

FOCUSING ON GOOD VITICULTURAL PRACTICES SUCH AS CORRECT SOIL MANAGEMENT, USE OF ROOTSTOCK AND SCIONS DIVERSIFIED AND ADAPTED TO THE ZONE, METICULOUS PLANTING AND PRUNING, CAREFUL AND METHODICAL OBSERVATION, ALLOWS FOR THE CULTIVATION OF HEALTHY VINES THAT ARE ETHICALLY, ECOLOGICALLY AND FINANCIALLY SUSTAINABLE FOR EVERYONE.

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