Fundamental Principles of Regenerative Farming Practices

We believe that we must have shared values with farmers of the Restore project and share common understanding of how soil and plants work in nature in order that we can work collaboratively with our local farming community to create a real regenerative future.

A. In this connection, we have drafted the following belief statements so that a set of implementation strategies can be worked out.

1. The nature of farmers' job is to grow crops that promote health. Maximizing the photosynthetic volume of the farmland, thus making the soil a positive carbon sink, is the only way to succeed.
2. Healthy crops have full resistance to all diseases and pests.
3. Diseases and pests do not spread by chance. They are the manifestation of the survival of the fittest mechanism in nature.
4. Mineral nutrition and microorganisms are the fundamentals of immunity and pest resistance. The biochemical mechanism of plant nutrition has a specific order.
5. The plants that grow naturally in an ecosystem are indicators of the biological, physical and chemical properties of the soil in that system. To grow crops suitable for human consumption on the same soil, these properties have to be readjusted.
6. We often harvest less than 20% of the seeds' original genetic potential.
7. With proper regenerative farming management practices, the yields of most crops can be increased by 30-100%.
8. Biology and biodiversity have preferences over chemistry. Vibrant organisms can overcome nutritional imbalances but not nutritional non-existence. On the other hand, without the help of living organisms, optimal result will not be achieved even with perfect nutrition.
9. Healthy plants are the driving force behind soil building and promoting soil health.
10. Healthy soil is not the driving force.
11. With suitable climatic, geological and geographical conditions, any crops could be cultivated to rebuild soil health and accumulate soil organic matters relative quickly.

The above premises are formulated upon reviewing the works of past and present masters of regenerative farming, including Anderson, Brown, Callahan, Dykstra,

Garcia, Husson, Huber, Ingham, Johnson, Kempf, Kinsey, Krasil'nikov, Mella, Phillips, Sait, Steiner, White Zimmer. This list, of course, is by no means exhaustive.

B. The implementation strategies adopted for our local farms comprise of cultural practices that enhance soil health and nutritional management practices that optimize plant health and yield. As far as possible, farmers are urged to:

1. Treat the soil as a biological culture dish in the laboratory.

   (Biology has preference over chemistry; the symbiotic relation between plants and soil microorganisms is always the most fundamental recurring theme. James White's concept of the rhizophagy cycle provides guidance for whatever is put into the soil.)

2. Create the best physical environment for the soil.

   Farmers are constantly reminded to pay heed to the fact that beneficial microorganisms operate best within certain temperature range and humidity and a stable environment. Means for maintaining the proper temperature of the soil and a good draining system as well as minimum tillage should be of paramount importance.

3. Putting the lost biology back to the soil.

   Farmers are introduced to the use of quality compost and farm-made bacterial liquid fertilizers and biological inoculants during seedling to enhance soil biodiversity as much as possible. They are also advised to pay attention to the differential needs of fungal-bacterial ratio for different crops along the natural plant succession stages.

4. Soil organisms need to be fed all year round daily, mainly through living plant roots and dry mulch.

   As most research on the use of cover crops are derived from climatic and geological contexts quite different from Hong Kong, adaptation must be made about the choice of crops for rotational purpose and also N-fixing species for green manure. Sourcing the right kind of dry mulch can also be a challenge as most farms in Hong Kong cannot practice agroforestry because of problem of farmland ownership.

5. Provide balance and adequate nutrition.

   As one of the primary goals of the Restore project is to create pesticide-free farms in Hong Kong in addition to carbon sequestration in farmland, much effort has been put to practice proper nutritional management to control crop pests and diseases so that farmers can grow crops of optimal health. To this end, the various interactions of the plant, pathogen, and environment must be manipulated carefully on a day-to-day basis. Measures have to be taken to move the level of genetic resistance of the plant from highly susceptible, tolerant, resistant to eventually immune by monitoring not only the nutrient availability relative to plant needs but also the form and biological stability of the nutrients. It takes time to test out the rate, timing, and method of nutrient application to ensure nutrient balance and integrity for various kinds of crops under different weather conditions while integrating fertilization with other cultural practices pertaining for regenerative farming. It gives us a much wider latitude to test out now that even life energy boosters like basalt powder and other paramagnetic mineral powders can be sourced from nearby places.

6. To ensure good resource management, plant's growth must be continually monitored with regular data collection about the health condition of the plant and photosynthetic efficiency. The present Restore project benefits from the upsurge of affordable handheld devices like the MicroBiometer, CO_2 meters, chlorophyll meters in addition to the widely used Brix meter in recent years. That partly helps overcome the handicap of the absence of agricultural lab service in Hong Kong.

7. Avoid adding excessive nutrients.

   Farmers in general are not cognizant of the fact that yield loss by pests and diseases is more often a result of excessive nutrients in plants rather than deficiencies, and that nutrient imbalance caused by excessive NPK and deficiency in micronutrients and trace elements is often the main culprit. It takes a while to help farmers move from the habit of applying too much too early to emphasizing nutritional integrity at the right time of the crop life cycle.

8. All kinds of pest and disease treatment by culling and poisons must be eliminated from farms as they will only lead to long term loss of biodiversity in soil and will have impact on the ultimate health of the crops.

9. **Success can only be achieved when all the above principles are practiced in their entirety. Farmers must be reminded that there is no silver bullet nor any shortcut to success if we want to have healthy sustainable farm ecosystems that benefit humans as well as planet Earth.**

HomelandGreen
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