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## Working With the STARS: Innovations to Green Growth & Organic Farming

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**ABSTRACT:** Organic Farming is becoming important, largely through the efforts of small groups of farmers. It has come out of the exploitative agriculture that has been followed by in all these years, resulting into damaging impacts on environment, human and animal health, and soil and water resources. Modern organic farming was started by Sir Albert Howard in England in the 1930s, emphasizing the use of compost instead of chemical fertilizers (Oelhaf, 1978). In 1924, Rudolf Steiner's concept of a healthy agriculture took into account not only crop rotations, sound stocking rates, and organic manuring, but also cosmic factors, namely the influence of the moon and planets. Biodynamic is an innovative & activated organic farming system that has significant role to play in the areas of sustainable agriculture with emphasis on ecological conservation and renewable resources. The activation is three dimensional. First are essential elements or minerals, followed by soil microbes and energized by cosmic forces that enliven the mother earth, makes nutrients available and adds to the vigor, flavor and health. Cosmic forces are trapped by the customized planting and gardening calendar. Observations led to believe that there was a relationship between the position of the moon relative to the sun (synodic rhythm), planting dates, and crop growth (Spiess, 1990). Biodynamic and organic farming are similar in that both are ecologically oriented and do not use chemical fertilizers and pesticides.

**KEYWORDS;** Biodynamic Calendar; Organic Farming;

### I. INTRODUCTION

Many people think that farming is a simple and mundane act, but they are wrong. It is the soul of any great culture, because it requires not only a great deal of accumulated knowledge, but also putting this knowledge to use every single day. Knowledge of the weather, the soil, plants, animals, the cycles of the nature: all of this is used every day by a farmer to make the decisions that have to be made in order to produce the food that we eat. To use it may seem like food comes from a factory, but in reality it comes from a culture that, generation after generation, has been created to produce that food.

It is well known now that increased use of chemical pesticides (rather abuse) and fertilizers have created chain of problems of soil, environment and water degradation. The intensive chemical agriculture that has been followed after green revolution successes is causing heavy pollution of our food, drinking water, air, the life expectancy has improved, but the quality of life has substantially deteriorated. The rural economy is in ruins because of over-dependence of outside inputs in agriculture such as seed, fertilizers, pesticides, growth-promoting chemicals etc. It is even said that the chemical agriculture has destroyed our ability to think about the right way to go forward. Fortunately, alternatives to chemical agriculture are available in organic, biodynamic and eco-technological farming approaches.

Bio-dynamic farming uses scientifically sound organic farming practices that build and sustain soil productivity as well as plant and animal health. The philosophical tenets of bio-dynamics — especially those that emphasize energetic forces and astrological influences are harder to grasp, dynamic agriculture, on the other hand, recognizes the existence of subtle energy forces in nature and promotes their expression through specialized "dynamic" practices. A third view, expressed by farmers, accept the premise that subtle energy forces exist and may affect biological systems, but holds there is not enough information to evaluate these influences or make practical

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The fact remains that bio-dynamic farming is practiced on a commercial scale in many countries and is gaining wider recognition for its contributions to organic farming, food quality, community supported agriculture, and qualitative tests for soils and composts. From a practical viewpoint bio-dynamics is proven to be productive and yield nutritious, high quality foods. has been clearly aware of the importance of organic and bio-dynamic farming approaches and the Ninth Five year plan document laid emphasis on 'Environment and sustainable agriculture', promotion of organically produced commodities, particularly in plantation crops, spices and condiments.

Organic farming is basically a holistic management system, which promotes and improves the health of the agro-ecosystem related to biodiversity, nutrient bicycles, soil microbial and biochemical activities. Organic and bio-dynamic farming emphasizes management practices involving substantial use of organic manures, green manuring, organic pest management practices and so on. It has also come to mean that it is a system of farming that prohibits the use of artificial fertilizers and synthetic pesticides. Bio-dynamic farming is an alternative variant where the chemical fertilizers are totally replaced by microbial (biological) nutrient givers such as bacteria, algae, fungi, mycorrhiza, actinomycetes.

Biological Pest management of crops is undertaken by employing predators, parasites and other plethora of natural enemies of pests, in addition to all the rest of option that help to avoid resorting to chemical pesticides. These agents could be augmented into farms or promoted through such activities that favor their flourished activities. Composting, Green manuring, crop rotations, Intercropping, mixed cropping etc. as well as bird perches, trap crops promote such biological activities. Although interpreted differently by various proponents, organic farming, biological farming, regenerative farming, bio-dynamic farming. Low external input sustainable agriculture (LEISA) low input sustainable agriculture (LISA) and sustainable agriculture connote the same ideology that provide integrated efforts to maintain agro ecosystems with futurism. Organic farming could then signify all such farming practices

## II. METHODOLOGY

### The Zodiac

The zodiac is the belt of fixed stars, which are formed in to the groupings, which we call constellation. The constellations are the actual groups of the stars seen in the sky. They are 12 in number & are unequal. The moon moves through the 12 unequal constellations in about 28 days. Thereby the moon stays in each constellation for 1 ½ to 3 ½ days. Every constellation has a dominant elemental influence and it affects any one of the four specific parts of the plants (Table No-1).

Table No-1.

Element	Earth	Water	Air	Fire
Parts	<i>Root</i>	<i>Leaf</i>	<i>Flower</i>	<i>Fruit</i>

In a particular constellation specific agricultural practice can be favorably carried out. The effects of the constellations can be beneficial as well as harmful on specific operation depending upon its suitability. The following table-2 shows relation between constellations, element and part.

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Table No-2; constellations, element and part

Element	Part	Constellation
Earth	Root	Virgo, Caprion, Tarus
Air	Flower	Gemini, Libra, Aquarius
Water	Leaf	Cancer, Scorpio, Pisces.
Fire	Fruit	Sagittarius, Aries, Leo

### MOON OPPOSITE TO SATURN

When moon is at 180 degree to the Saturn it produces beneficial effect on the plants growth. In this constellation forces of the Moon and the Saturn interpenetrates and enhances on another, intensifying life forces on the plants. **Moon** being the inner planet supports calcium balance into the plants, attracts the water element-the sap in stem & leaf and **Saturn** being the outer planet (farthest from sun) supports silica process.

#### Impact on Agricultural Activities:

##### [A] If seeds are sown at this stage they show:

- 1- Seed germination is very good with strong seedling.
- 2- Quality of growth of plant increases like: resistance to the fungal attack increases.
- 3- Strong plants well formed.
- 4- Plants have resistance to insects.

##### [B] Silica Manure (501) Application:

1-Spray of B.D.501, 1 gram per acre at the moon opposite to Saturn strengthens the plants against mildew, greasy spot, and rusts like diseases.

##### [C] Plant Growth:

- 1- Moon opposite to Saturn produces strong, resilient and healthy plants.
- 2- Plants ability to resist infection increases.

### LUNAR RHYTHEMS

#### MOON OCCULTATION

Takes 29.5 days of which 1<sup>st</sup> part is called as called as *Shukla Paksh*, the moon begins to rise and is lit by the sun. A fully lit moon is **Full Moon** or, **Poornima**. In the 2<sup>nd</sup> part Moon travels to the other side and in the faces, towards Earth receive no Sunlight and is dark called **New Moon** or, **Amavasya**.

#### Effect of Full Moon or, Poornima & New Moon or, Amavasya on the Plant Physiology:

SN	Full Moon or, Poornima	New Moon or, Amavasya
1	The Moon effect is weak and the sap of the plant is drawn downwards. Resulting in the very less water content.	The Moon effect is strong and the sap of the plant is drawn upwards, attracted in to the stem and leaves.
2	Ideal time for harvesting.	Ideal time to sow seeds
3	Plants are less prone to fungal attack.	More activity under ground in the soil
4	Water absorption capacity of seeds increases.	Good time for turning green manure, cutting hay.

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## ZODIAC SIGNS CORRESPONDING TO ELEMENTS

Roots or Earth Day	Capricorn, Virgo, Taurus
Flower or Air Day	Gemini, Aquarius, Libra
Fruit/ Seed or Fire Day	Aries, Leo, Sagittarius
Leaf or Water Day	Pisces, Scorpio, Cancer

### Rahu & Ketu

RAHU: Lunar node in ascending moon period is called Rahu.

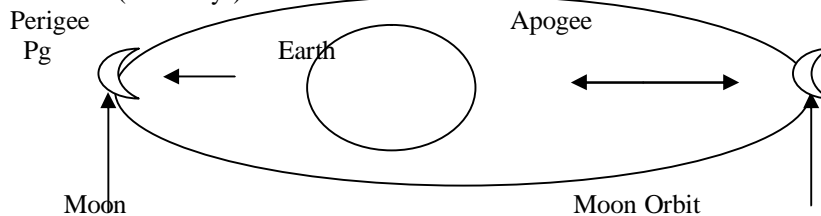
KETU: Lunar node in descending period is called Ketu.

### ASCENDING MOON & DESCENDING MOON [Cycle: 27.3 Days]

Moon moves in the elliptical path around the Earth and appears to be rising and setting this is called as ASCENDING MOON & DESCENDING MOON respectively. The period is very important in the plant growth and development. The moon rotations around earth are very specific and rhythmic. The different stages and positions of moon affect the life forces by simply influencing the moisture content and temperature on the earth surface. These conditions are very important in prophylaxis, germinations, growth and development of the seedlings, harvesting of the crop and post-harvest management of the grain, fodder and food. The characteristics are described in the following tables-3:

DESCENDING MOON: setting moon in the sky.

LUNAR NODES (27.2 Days)



**Table No.3:** Ascending moon & descending moon

SN	Ascending moon	Descending moon
1	The earth is breathing out- the development of the plant is in the parts above the ground e.g. flowers, fruits, & leaves.	The earth is breathing in- the development of the plant is in the parts below the ground e.g. roots.
2	Cosmic energy is attracted in the upper parts of the plant	Cosmic energy is attracted below the soil surface.
3	Spring and summer conditions.	Autumn and winter conditions
4	Good for : Stem & sap development : Grafting : Seed sowing (strong germination) : Leaf & Fruit harvesting : Fodder (full of vitality)	Good for: : Root development. : Transplanting saplings & small shoots. : Ploughing. : Spreading Compost. : Harvesting root crops.
5		

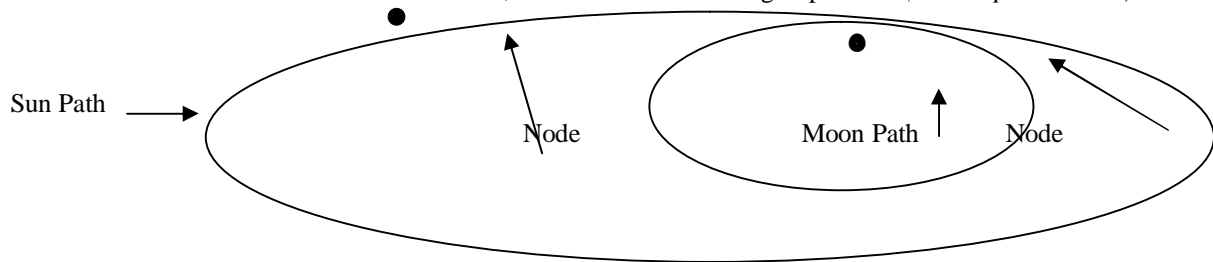
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PERIGEE: when the moon is nearest to earth, at perigee plants are prone to fungal attack.

APOGEE: when the moon is farthest from earth, best time for the sowing of potatoes (*an exceptional case*).



## KEY TO THE SYMBOLS and TERMINOLOGY

To understand the biodynamic calendar and the working mechanism of the formative cosmic forces in sustainable agriculture process one need to remember the following terms and symbols:

CONSTELLATION : is group of fixed stars.

APOGEE : when the moon is farthest from earth.

ASCENDING MOON : rising moon in the sky.

DESCENDING MOON : setting moon in the sky.

KETU : Lunar node in descending period is called Ketu (27.2days).

PERIGEE : when the moon is nearest to earth.

RAHU : Lunar node in ascending moon period is called Rahu (27.2days).

ZODIAC : is the belt of fixed stars.

## III. RESULTS

Working with the stars in farming and gardening manages to increase production between 9-27%. But the most important effect of the cosmic influences is observed in the taste, smell flavor and nutritional values of the crops and products.

## IV. DISCUSSIONS

### Facilitating Factors for Greening of Indian Agriculture

Organic agri-biotech provides economic opportunities for different stakeholders. Some of the drivers that facilitate growth of organic agri-biotech in India are:

1. Growing export market for organically produced crops (Kortbech, et.al. 2003).
2. Price premium for organically produced agriculture products from 10% to 100% (V. Garibay, K. Jyoti, 2003).
3. Diverse agro-climate regions across the country that provides environment for wide range of crops that can cater to different market demands.
4. Increasing awareness & health consciousness especially among certain sectors of domestic consumers.
5. Availability of comparatively cheap labor for labor-intensive organic agri-biotech.
6. Huge numbers of small farmers those who do the traditional farming with very limited capacity to pay for most of the chemical inputs into agriculture ((Planning Commission, 2001).
7. Enhanced Government attention and support for organic agri-biotech through various policy initiations and action programs.
8. Presence of Non-Government Organizations (NGOs) as active promoters of Organic farming in different agro-climatic regions. Increasing involvement of private companies in field of agricultural extension, trade, consultation and other services.

### Factors Constraining Greening of Indian Agriculture

Though there are positive signs for green agriculture in India it is not growing at a pace to enhance its market attractiveness so as to motivate larger section of farming community to opt for organic agri-biotech. Exercise shows

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that the penetration of greening the agriculture in India is limited. Major problems that hinder the growth organic agri-biotech in India can be listed as follows:

## **From Users' (farmers') point of view:**

1. Bio-fertilizers and bio-pesticides are perceived as less yielding.
2. Some climatic regions and soil conditions are not suitable for specific strains of organic production.
3. For some strains limited shelf life is also constrain as most of the bio-input last only for about 4-6 months.
4. Given the mandated gestation period of around three years for a conventional farm to become an organic farm the benefits perceived by farmers in general and small and marginal farmers in particular tend to be limited as they have short term orientation.
5. As a result even if they are aware they are hesitant to switch over to organic (green) agricultural practices.

## **From Promoters' (Government's) point of view:**

1. Agricultural departments, research institutions and extension services have for long been oriented towards chemical input agriculture as a result there is a requirement for reorienting these officials towards organic (green) agriculture
2. Changing the cropping and cultivation patterns is slow and time-consuming process given the high levels of illiteracy and large number of small and marginal farmers it makes the change process difficult.
3. Subsidies on chemical fertilizers and pesticide impede the growth of organic agri-biotech.

## **ORGANIC AGRI-BIOTECH AND RURAL DEVELOPMENT**

Rural development aims to improve the quality of life of rural communities, by satisfying their socio-economic and cultural aspirations and strengthening their social organization, while protecting natural resources. Organic agri-biotech, in its holistic approach, contributes to rural development in the following ways:  
Enhances governance

It puts the farmer at the center of the farming strategy restoring a decision-making role to local communities, guaranteeing their right to control their own resources and engaging their active participation in a value added food chain.

Creates a vibrant economic space

Reduced mechanization and avoiding use of agro-chemicals create employment and increase returns to labor. Diversified production of quality products decreases the impacts of crop failures and increases marketing opportunities. Income and food security is achieved through diversity.

### **Maintains a healthy environment**

Through its ecological approach, it maintains the integrity of the ecosystem and the productivity of natural resources. It preserves natural landscapes and wild species, restores life to soils and maintains agro bio-diversity by using and developing local seeds. In reducing the use of chemical inputs, organic agri-biotech provides a healthier working environment to farmers.

### **Builds the social capital of rural areas**

Being knowledge intensive, rather than capital and resource-intensive, it utilizes traditional knowledge and promotes farmer-to-farmer exchange. It provides tools for inspection and control, like Internal Control and Participatory Guarantee Systems that strengthen social organization and empower rural communities. Organic agri-biotech is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agri-biotech combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved (Giovannucci, D. 2005). Current agricultural practices force people to abandon rural areas unsustainable food systems. More and more farmers are depending on only a few crops that demand substantial investments and create dependence on sometimes unavailable and ineffective agricultural inputs. Input costs are high and market prices continue to decrease forcing farmers and workers to abandon their fields. Millennia of traditional and indigenous knowledge are being lost.



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## Conserve natural resources

Monocultures using large quantities of chemical fertilizers and pesticides provoke desertification, salinization and contamination of land and water, resulting in the loss of productive lands, ecosystem biodiversity and the extinction of species. Organic farming conserves natural resources like water, minerals, biodiversity etc.

**Poverty:** In search for livelihoods, farmers and workers migrate to cities, increasing substandard housing and impoverishment of marginal urban communities. There they have a reduced ability to purchase quality food. The diversity of their diet is decreasing and therewith their chances of adequate nutritional health. Organic agri-biotech is a model for rural development Organic agri-biotech is demonstrating with real-life examples how to enhance economic, social and environmental sustainability. Not only rural populations enjoy the fruits of Organic agri-biotech, urban citizens are better off as well. Therefore governments at local and national levels should use Organic agri-biotech as a strategy for rural development, involving rural communities and consumers in their decisions. Local authorities can create positive conditions for developing organic agri-biotech in their region. This can be achieved by:

1. Organizing daily and weekly farmers' markets in cities.
2. Providing local and organic food in public canteens (schools, hospitals, etc.).
3. Promoting the establishment of eco-agro tourism.
4. Educating younger generations on the close links between agriculture, ecology and their daily food.

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