



RESEARCH ARTICLE

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Effect of Thought Transaction on 'Okra' Yield

S LETCHOUMANANE^{1,2}, VIJAY K GUPTA^{3,4*}¹Professor (Retd.), Tamilnadu Agricultural University, Coimbatore, India.²World Community Service Center, Chennai, Tamilnadu, India.³Professor Emeritus, University of Colorado, Boulder, CO, USA.⁴World Institute for Scientific Exploration, Baltimore, MD, USA.

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ABSTRACT

The foundation of this research lies in the hypothesis that thoughts transmit BioElectroMagnetic (BioEM) energy. We review pertinent literatures from the ancient science of yoga and the modern science to provide a scientific rationale for our hypothesis. Two field experiments—randomized block design with multiple replications—were conducted at the Temple of Consciousness, Aliyar, Tamil Nadu, India, to study the effects of thought transaction in Theta mental frequency on okra (*Abelmoschus esculentus* L) yield. In addition, 3% “Panchagavya”, as described in the ancient science of Indian agriculture called *Vrikshayurveda*, was employed in this study. Thought transaction resulted in significantly higher yields with or without the application of *Panchagavya* than untreated control. Appearance of aphids, a sap-sucking pest noticed at 20 days after sowing the crop, was naturally suppressed by enemies like lady bird beetle (*Coccinella* sp.) and hover flies (*Syrphids*). The crops were found to be pest- and disease-free without applying any pesticides. Therefore, our research addresses an economically viable and safe crop production practice in contrast to the modern and industrialized agricultural practice that has deteriorated the human and the environmental health.

Keywords: Thought transaction, Bioelectromagnetic (BioEM) energy, Theta frequency, Panchagavya, Agriculture

Introduction

There is a long tradition of indigenous farming knowledge in India. It is being revived through scrutinized and modern scientific research. We investigate the role of thought transaction in enhancing crop yield without harmful side effects on human health and the environment. Modern industrialized agricultural practices have caused extensive soil erosion, excessive use of water in agriculture, increased salinity, pollution due to fertilizers, herbicides and pesticides, reduction of socio-economic values and degrading effects on environment, humans and animals, danger to food security, quality and safety, and reduced bio-diversity. A lack of sustainable agricultural policy for the future generations and the gravity of environmental degradation are drawing attention of scientists, planners and farmers towards ecologically sound,

viable and sustainable farming systems for different soil and agro-climatic situations. For instance, Shiva [1,2] has condemned industrial agriculture as a recipe for ecological and economic disaster. An effective alternative is small independent farms to ensure biodiversity that is inherent to the traditional farming practiced in small-scale organic agriculture systems in India [3]. They have proven to be highly effective, productive and sustainable [4].

To meet our objective stated above, we use the simplified Kundalini Yoga (SKY) system, pioneered by a contemporary philosopher Yogiraj Vethathiri Maharishi, which encompasses ancient wisdom, theory and practices for the modern age [5]. The SKY system of meditation is based on linking one's mind with the life force in the body. It is also known by other names in the literature such as Kundalini energy in ancient yoga, Qi in Chinese healing [6], Bioenergy [7] and Bioelectricity in the ancient Indian acupuncture for self-healing [8]. Vethathiri [9] defined the life force current in a living system as a group of very minute 'life-force particles' circulating throughout the

*Corresponding Author

Vijay K Gupta

Professor Emeritus, University of Colorado, Boulder, CO, USA.

Email: viijay.gupta@colorado.edu

physical body of a living system. Circulation of the life-force particles is akin to the 'electrons' in an electric current flowing through a wire. These life-force particles generate bio-magnetism [9] or the BioElectroMagnetic (BioEM) field that supports the hypothesis of a close connection between life force and BioEM. Indeed, Waechter [6] hypothesized that "Qi" or the "life-force" is closely related to the BioEM energy. Dhamodharan [10] experimented with the SKY meditation system using Electroencephalogram (EEG) where the mental frequencies were systematically reduced from Beta to Alpha to Theta to Delta during meditation. These findings serve as the key motivation for our overarching scientific hypothesis tested here that thoughts transmit BioEM energy.

We review pertinent literature from the ancient science of yoga and the modern science to provide a scientific rationale for our hypothesis. The ancient science of yoga was formalized in India thousands of years ago, and it is rooted in mind and consciousness [11]. It may be contrasted with the modern science that is rooted in matter, and was formalized about 500 years ago [12]. We show the effect of thoughts on enhanced yield of okra through carefully conducted plot-scale experiments without applying any fertilizers and pesticides. Results of this study demonstrate how mind influences matter and that mind is not limited to brain that the modern science posits [12].

In India, it has been a traditional practice of farmers to worship soil, water, sun, seeds, farm implements and farm animals before the cultivation of crops. Farmers visited their fields at dawn and went around their crops to bless them. Their thought waves created the positive and desired effects on the crops and the farmers reaped a good yield at the end of a season. Can thoughts have a measurable effect on crop yield? It is a fundamental question that the authors investigate in this study.

The rest of the paper is organized as follows. Section -2 on the review of literature is divided into two subsections. The first one gives a brief review of the literature on the ancient science of *Vrikshayurveda* (Ancient Indian science of plant life) [13], pertinent to this research. The second subsection provides a brief review of a new experiment describing how thought transaction in Theta mental frequency affects plants in a laboratory under controlled conditions. Section-3 reviews pertinent literature from the ancient science of yoga and the modern science to provide a scientific rationale of our hypothesis. The experimental study to test our hypothesis is given in Section-4. The results of this study are given and discussed in Section-5. The conclusion and future topics that are yet to be explored are described in the two end sections.

A Brief Review of Literature

Our review of the literature is divided into two parts. The first part reviews pertinent concepts from the ancient science of *Vrikshayurveda*. The second part reviews a recent study regarding a laboratory-scale experiment on the impact of

thought transaction in Theta mental frequency on plants.

1. Ancient Indian Science of *Vrikshayurveda*

India has a grand scientific legacy that is thousands of years old. We call it "ancient sciences from India". Many Indian sages and revelators made profound contributions to the ancient sciences. The evidence includes the first accounts regarding gravity, inventing the concept of zero, earth's spherical nature and rotation on its axis, architecture, astronomy, literature, mathematics, agriculture, medicine, surgery, yoga and many others [13].

The traditional system of *Vrikshayurveda* that developed in India is attributed to Surpala dated around 1,000 AD [14], but references to ancient agriculture predate it to the Vedic period [3]. *Vrikshayurveda* described the use of Panchagavya in agriculture. Panchagavya consists of nine products, but the name derives from five cow products; dung, cow urine, milk, curd, and ghee. The other four are, banana, Tender coconut, Jaggery (raw cane sugar) and water, which are added later as additives for further improving its quality. Tamil Nadu Agricultural University (TNAU) portal on organic farming [15] gives comprehensive modern information about it. Maheswari et al [16] have reported on the basis of chemical analyses of Panchagavya that it contains flavones, phenolic compounds, steroids, vitamins and several other compounds that are useful for plant growth. Indeed, modern research at TNAU conducted by their group has observed that Panchagavya enhances crop yield. Yadav and Lourduraj [17] have demonstrated that it works as a biopesticide. Our research results presented here give an independent support that Panchagavya gives an enhanced crop yield.

2. Effect of Thought Transaction on Plants

Rajendran et al [18] conducted a laboratory experiment using thought transaction on tomato plants that were infested with root-knot nematodes. The thought transaction technique consisted of two steps: (i) The experimenter transacted thoughts in Theta mental frequency via SKY medication that is defined in the next section. (ii) The thought transfer to the plants was that "the plants in the treatment should be protected from the nematodes and the plant should grown in high vigor and able to resist the attack of nematodes".

The tomato plants were raised in pots of 1.5 kg capacity filled with sterilized pot mixture in a glass house. A plant with sterile soil without nematode was categorized as the "control set". The second set of treatment was with inoculum level of 1000 larvae/plant that received no thought transaction. The last set of treatment was with tomato with 1000 larvae/plant with thought transfer, as explained above.

After daily transaction for 45 days, the plants were examined for root growth, vigor and for the development of any root knots/galls due to nematode. The treated and untreated plants were subjected to biochemical analysis. The treated plants were observed to be healthy with more number of roots and no galls compared to the control and the plants that received no

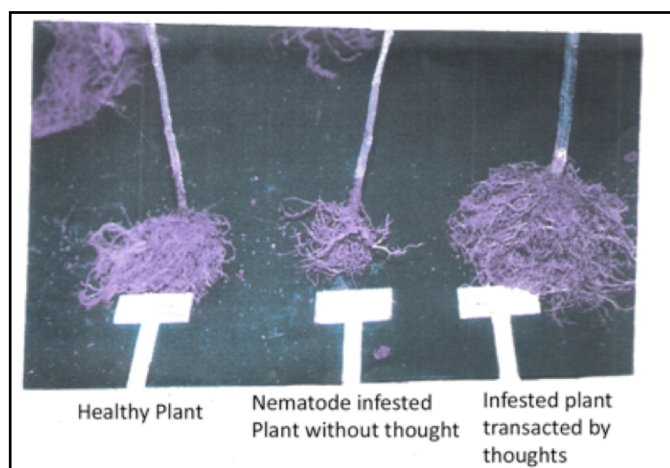


Figure 1: Effect of thought transaction for inducement of resistance [18].

thought transaction. The plant growth characteristics were perceptibly enhanced due to increased vigor as shown in Figure 1.

This study revealed that the increased chemical stimulation enhanced protein profiles and enzyme activities such as peroxidase and polyphenol oxidase, which in turn were responsible for resisting the invasion. In-depth chemical analysis is given in Rajendran et al [18]. Response to music by plants is known to science as the sound vibrations activate or depress the plants based on vibration. Plants respond to external stress of environment [19]. This study demonstrated that the plants respond to thoughts in low mental frequency of the scientist by modifying their chemical composition and behavior.

A Hypothesis Linking Thought Transaction with BioElectromagnetism

Bose [20] conducted the first set of experiments to test how plants respond to external electro-magnetic (EM) stimuli. An electric current passing through a wire generates magnetic field, which is known as the EM field in Physics [21]. The study concluded that, “the growing plants not only perceive but also respond to the stimulus of electrical waves. These effects were found in all growing plants”. This research offers the first step towards understanding the work of Rajendran et al [18] reviewed above. We hypothesize that thought transacts BioEM energy, and review pertinent literature from the ancient science of yoga and the modern science to provide a scientific rationale for our hypothesis.

Saint Patanjali, who lived prior to 150 BCE or 2164 years ago [13], formulated the ancient science of yoga in his renowned 196 Yoga-Sutras. Taimni [11] translated the yoga sutras in English and provided an in-depth and comprehensible commentary on their significance. Patanjali defined Yoga in four Sanskrit words, “yogas chitta-vritti-nirodhah”, translated

as, “Yoga is the inhibition of modifications of mind”. Yograj Vethathiri Maharishi [5, 22] developed the SKY meditation system for the modern age that is based in linking mind with the life force in the body as explained in the introduction.

Modern research has shown that brain works in different frequencies that can be measured using EEG. These are, (1) the normal Beta frequency (12-35 cycles per second (cps)), (2) Alpha (8-12 cps), (3) Theta (4-8 cps), and (4) Delta (0.5-4 cps) [23]. Dhamodharan [10] took EEG measurements on him-self during SKY meditation, so he could observe brain frequencies in different stages of meditation. He found that mental frequencies couldn't be separated from the brain frequencies. This is a very fundamental finding because it gives a clear road map to how different mental frequencies correspond to different stages of SKY meditation [5, 22]. In Delta frequency, mind of a mediator begins to go beyond the dualistic nature of reality. Thus, it provides an experiential (observational) basis for the non-dual state of reality that was explained and written elaborately by ancient Indian sages. SKY streamlined the process for all the meditators to experience the state of oneness. There is a huge literature on this topic that is beyond the scope of our research.

Main Hypothesis: Thought transaction on an object transmits BioEM energy to that object.

Cutting-edge biological experiments have demonstrated the influence of environment on cells. Quoting from Lipton [24] “specific frequencies and patterns of EM radiation regulate DNA, RNA, protein synthesis, control gene regulation, cell division. Moreover, EM frequencies are 100 times more efficient in relaying environmental information to cells than physical signals”. The fact that EM and BioEM energy are environmental input to the plant cells should be noted. It gives a scientific rationale for our hypothesis. One expects that BioEM input to crops via thought transaction can greatly increase yield without any of the health and environmental hazards that accompany modern chemical and biotechnological agricultural practices. We tested our hypothesis on okra yield in a set of carefully conducted field experiments.

Experimental Details

We studied the effects of thought transaction in Theta mental frequency using the SKY system, and also evaluated the effect of Panchagavya on okra (lady's finger, or *Abelmoschus esculentus* L). Okra was selected for our study because it is a short-term crop. Two experiments were conducted in 2010 and 2011 in randomized replicated trials at the Temple of Consciousness, Aliyar, India. The first experiment was conducted with six treatments, T_1 - T_6 and four replications R_1 - R_4 while the second was done with three treatments (T_1 , T_2 , T_3) and seven replications, R_1 - R_7 . The plot sizes in both the experiments were 4 m x 5 m.

Our field-scale agriculture experiments differ from those conducted under isolated conditions in a laboratory [18]. Our

main goal is to advance organic farming in real-world situations. In a non-isolated and open system like ours, there are undoubtedly random influences of various sorts that can not be controlled. That is why the experiments were replicated, experiment-1 four times, and experiment-2 seven times in randomized block design as mentioned above. The details of treatments are given below:

Treatments in Experiment-1

The treatments are defined as follows, T₁: Thought transaction for 2 min; T₂: Thought transaction for 5 min; T₃: Thought transaction for 5 min + Panchagavya 3%; T₄: Thought transaction for 2 min + Panchagavya 3%; T₅: Panchagavya 3% alone; T₆: Untreated control.

Treatments in Experiment-2

T₁: Thought transaction for 5 min; T₂: Thought transaction for 2 min; T₃: Untreated control

In the first experiment the crop was sown as per normal recommended practices in agricultural sciences. The authors gave thought transaction in Theta frequency between 6.30 AM and 8.30 AM every day that consisted of 'wellness of the crop and good yield' on all plots except the control. Each experiment was continued up to 60 days from the date of sowing, and the yield of pods was recorded up to the 8th harvest.

Treatment with Panchagavya was given as 3% spray in the evening between 4.30 PM and 5.30 PM at 10 days interval. Observations were made on the advent of pests and disease and the emergence of their natural enemies. No chemical pesticides were used at any time in the experiment. In the second experiment same procedure as in the first experiment involving thought transaction was adopted.



Figure 2: A snapshot from the field experiment during treatment T₂ and replication R₂

Results and Discussion

We totaled the yield from the 8 harvests for each plot in each experiment and analyzed the data separately. We assumed that yield from each treatment is statistically independent but differs from one another in its mean, but otherwise it comes from a common probability distribution. As a result of this assumption, we pooled all the data sets together, and computed the standard deviation (SED) = 808.09. A 5% confidence interval was computed around the mean $\pm$ a value D/2, where D is the critical difference (CD) = 1722.42. The reader may observe from Table-1 that yield for each treatment and each replication falls within the 5% confidence interval around the corresponding mean yield.

Figure 2, shows a snap shot from the field experiment during treatment T₂ and second replication R₂. From the results of the first experiment, it is found that plants respond well to thought transaction in Theta frequency. The mean yield of the crop is increased by more than 121% over the untreated control. Panchagavya, being a natural product, was found to enhance the mean yield by 68.45%. Gore and Sreenivasa [25] have observed similar growth stimulant and biological efficiency enhancement effects of Panchagavya in tomato. Yadav and Lourduraj [17] reported that foliar application of Panchagavya 3% along with application of organic manures gave enhanced rice quality.

There was no significant difference in yield between the combinations of Panchagavya with 5-minute thought transaction treatments T₃ and without Panchagavya T₂ as shown in Table-1. Interestingly, the yield in treatment T₁ increased to that in T₂ and T₃ when the 2-minute thought transaction was combined with Panchagavya in treatment T₄. Moreover, the mean yield from treatments T₂, T₃, T₄ turned out to be about the same. This finding suggests that under the 5-minute treatment, the okra yield reached its maximum potential, and adding Panchagavya did not increase the yield any further.

In the 2nd experiment, thought transaction of 5 min and 2 min durations (T₁ & T₂) were adopted as shown in Table-2. Treatment with Panchagavya was eliminated on the basis of the results obtained in the first experiment shown in Table-1, and discussed above. The computed values of SED=1198.7, and CD (.05) = 2611.9047. It leads to results that are similar to those in Experiment-1. The yields for each treatment and each replication fall within the 5% confidence interval around the corresponding mean yield.

Increased yield response in both the experiments supports our hypothesis that induction of BioEM energy via thought transaction in Theta frequency gives substantially higher yield. We also conjecture that the strength of BioEM energy increases as the mental frequency decreases. Our research suggests that the metabolic functions of the plant are influenced through growth and yield hormones. Natural enemies against pests and diseases multiply normally in any crop environment, and the

Table 1: Statistical analysis of total yield of okra in Kilograms from experiment-1

Type of Treatment	R ₁	R ₂	R ₃	R ₄	Mean Yield in kg	Percentage Increase over control
T1	14488	14230	13173	12570	13615.25	87.89
T2	16434	15288	17306	14986	16003.5	120.84
T3	15434	18895	14246	15411	15996.5	120.74
T4	16948	16200	14365	15935	15862	118.89
T5	12470	11440	12284	12633	12206.75	68.45
T6	6662	8305	6895	7123	7246.25	Control

Table 2: Statistical analysis of total yield of okra in Kilograms from experiment-2

Type of Treatment	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	Mean Yield in kg	Percentage increase over control
T ₁	10070	9897	11447	13253	12744	14024	12380	11973.57	114.41
T ₂	10705	10993	10879	11739	2710	11786	13980	10398.86	86.24
T ₃	5675	5893	5697	5982	4989	5017	5838	5581.43	Control

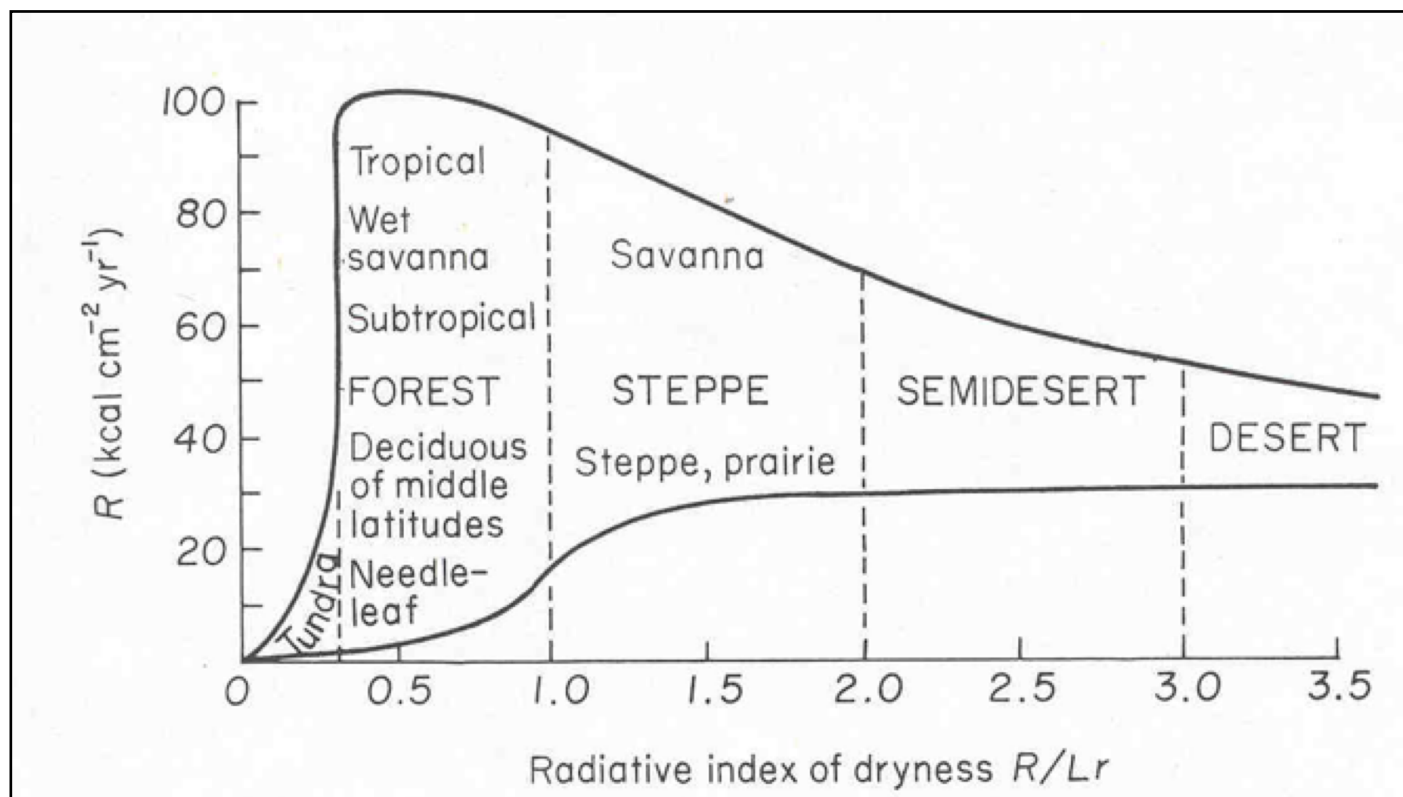


Figure 3: Diagram of Geo-botanic Zonality [27].

same condition was also observed in our experiments. Appearance of aphids, a sap sucking pest noticed at 20 days of crop was naturally suppressed by natural enemies like lady bird beetle (*Concinella sp.*) and hover flies (Syrphids). The crops were found to be pest and disease free. It kept the cost of growing okra below the economic threshold for making a profit, which is largely due to the fact that no expenses involving chemical fertilizers and pesticides were incurred in our experiments.

Conclusion

Our findings are summarized in three key conclusions as.

1. The two experiments demonstrated that plants respond positively to thought transaction in low mental frequency. The growth and the mean yield is increased 121% over the control. Panchagavya, being a natural product, by itself is found to enhance the growth and mean yield by 68%. Our results confirm that of other researchers [16, 17].
2. There was no observable difference in yields in the presence and absence of combination of Panchagavya and a five-minute thought transaction treatment, as shown in Table-1. Interestingly, the yield from 2-minute thought transaction in combination with Panchagavya increased substantially and reached a level comparable to 5-minute thought transaction. In other words, the mean yields from treatments T_2 , T_3 and T_4 in Table-1 turned out to be about the same. This finding shows that the okra yield reached its "maximum limit" under these three treatments.
3. Natural enemies against pests and diseases multiplied naturally in our crop environment and checked the pest multiplication without any chemical pesticides.

The above three findings demonstrate the validity of our main hypothesis. However, extensive tests of our hypothesis for different crops under different environmental and soil conditions are necessary to develop a new technology that involves BioEM energy via thought transaction as an external input. This technology offers enhancement of food production free from pesticides. The food so produced will mitigate environmental pollution and eliminate health hazards. Therefore, our research addresses an economically viable solution to very serious global problems that the current chemical and biotechnological agricultural practices have created.

Topics for Future Research

We briefly discuss three key topics for future research amongst many that our research suggests.

1. We need to better understand and confirm our initial finding that okra yields show a maximum limit under three different treatments. One needs to explore if the concept of shoot-versus root allocation of resources is pertinent in this

context [26].

2. Measuring yield need not be a reliable indicator of plant health. One can increase yield but still have an unhealthy plant. There is a better way to measure health than yield. It can be done in one of three ways. (i) Measure the Brix (total dissolved solids) levels of the plant sap with a Brix Refractometer and compare it to 12. (ii) Measure the pH of the plant sap with a pH meter (Horiba) and compare it to 6.4. (iii) Measure the photosynthetic rate of the plant in question using a Photosynthesis Meter (at leaf).
3. Spatial distribution of natural vegetation is determined by the geophysics of long-term values of mean annual solar radiation R , and mean annual precipitation r [27]. Fig. 3 shows global vegetation distributions in different climates ranging from the tundra to the desert. The radiative index of dryness is defined by the dimensionless ratio, R/Lr , where, L is the latent heat of vaporization. Budyko [27] mentions that the relationship between soil zonality and climate indices is similar to that in Figure 3. Therefore, a geophysical distribution of natural vegetation can serve as a key guide for planting crops that can optimize water use in given soil types. New research needs to be carried on comparing yields and reducing water use under different combinations of thought transaction with respect to change in R/Lr and R . Likewise, It would be possible to determine the maximum crop yield in each hydro-climatic zone through BioEM energy input using thought transaction in low mental frequency. It suggests a new framework for sustainability that links global food production, climate, water and health.

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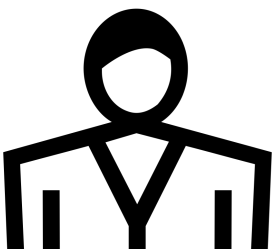
Authors Column



Biography of Dr. S. Letchoumanane

S. Letchoumanane (Retd.) is a former scientist of Tamil Nadu Agricultural University, Coimbatore. His field of specialization is Agricultural Entomology. He has published 78 research articles in the pest management of crops like rice, sugar cane, banana, pulse crops, vegetable crops, coffee, pepper, etc.

Apart from his scientific career, he developed quest for Indian philosophy and became a disciple of Yogiraj Vethathiri Maharishi who introduced the Simplified Kundalini Yoga (SKY) system to the world. As a Senior Professor, he conducts advanced courses at all SKY centers and in universities in Tamil Nadu, and internationally.



Biography of Professor Vijay K. Gupta

Vijay Gupta is a professor emeritus at the university of Colorado, Boulder. He pioneered new approaches through interdisciplinary collaboration to understand the water cycle on multiple space and time scales. He served on the editorial boards of prominent international journals, and lectured all over the world. Vijay is a fellow of the American Geophysical Union (AGU). He received the 2008 AGU Robert E. Horton medal for “outstanding contributions to the geophysical aspects of hydrology”. Vijay studied and practiced Simplified Kundalini Yoga (SKY) with Yogiraj Vethathiri Maharishi for three decades. He is currently investigating the deep and unified science that the SKY philosophy offers.