A Statistical analysis of the Effect of Yogic and Organic fertilization on the nutritive values of soyabin

Dr. Kiran Raval

Dept. of Home Science, Tolani College of Arts & Science, Adipur. Gujarat

Abstract :

Even in the era of industrialization, farming in India has been a vital activity. However, a significant change has been found in the techniques of farming. The focus on more and more production in the minimum time has lead farming to unnecessary and excessive use of chemical fertilizers, ultimately resulting into infertility of soil and production of unhealthy foods. The Rajyoga Education & Research Foundation (RERF) of the Rural Development Wing of Brahma Kumaris Ishwariya Vishwa Vidyalaya, Mount Abu (Rajsthan), India have launched a new & unique world project ' Sustainable Yogic Agriculture : a new step for new Yuga' which was founded to undertake research on improvement of performance of several crops which are grown organically & are exposed to Spiritual Yogic Power through Rajyoga Meditation. This paper aims to have a statistical overview of one of the experiment made on soyabin farming to understand the various effects of Yogic farming on the nutritive values.

Introduction :

The Rajyoga Education & Research Foundation (RERF) of the Rural Development Wing of Brahma Kumaris Ishwariya Vishwa Vidyalaya has introduced the concept of 'Yogic Farming' for the last 8 years, under which several experiments were conducted in Maharashtra & other States with execution of organic farming accompanied with Rajyoga Meditation on crops such as Tomato, Sugarcane, Cucumber, Wheat, Chilly, Egg plants etc.

These experiments have revealed that not only the net profit per unit area was

increased and qualitative parameters were better in Yogic farming. In tomato for ripe fruits per 100 gram the percent protein increased from 0.74 to 1.13, Carbohydrates from 4.15 to 5.67, Vitamin C increased from 6.05 mg to 14.90 mg resulting in increased energy value per 100 gram tomato from 19.5 K Calories to 27.47 . However, the fat was reduced from 0.2 to 0.1 %. In addition the appearance & the taste of tomato was most appreciable due to Rajyoga Meditation.

These observations suggest that one cannot ignore the Universal Spiritual Power which is infinite & can be transmitted as vibrations to plants by Human beings for better plant performance. The pure food will make pure minds & the powerful human beings will make the world healthier.

Research Methodology :

1. The data was collected, which represented the figures of the nutritive values of Soyabean by Shri Shivaji College of Agril. Biotechnology, Amravati
2. Some statistical tools were applied on this data to work out the significance of yogic farming in terms of nutritive values.

Data Collection :

The following is a data representing some of the nutritive values from the Report of Soyabean by Shri Shivaji College of Agril. Biotechnology, Amravati :

Table 1

Report of soybean grain sample of yogik kheti and organic kheti

Parameters	**Units**	**Results**	
		Yogic	**In Organic**
Protein(total)	%	35.00	18.72
Carbohydrates(starch)	%	4.36	10.47
Energy value	Kcal/100gm	157	116

An important Statistical Test : F- Test :

An **F-test** is any statistical test in which the test statistic has an F-distribution under the null hypothesis. It is most often used when comparing statistical models that have been fitted to a data set, in order to identify the model that best fits the population from which the data were sampled. Exact *F-tests* mainly arise when the models have been fitted to the data using least squares. The name was coined by George W. Snedecor, in honour of Sir Ronald A. Fisher. Fisher initially developed the statistic as the variance ratio in the 1920s.

Multiple-comparison ANOVA problems :

The F-test in one-way analysis of variance is used to assess whether the expected values of a quantitative variable within several pre-defined groups differ from each other. For example, suppose that a medical trial compares four treatments. The ANOVA F-test can be used to assess whether any of the treatments is on average superior, or inferior, to the others versus the null hypothesis that all four treatments yield the same mean response. This is an example of an "omnibus" test, meaning that a single test is performed to detect any of several possible differences. Alternatively, we could carry out pairwise tests among the treatments (for instance, in the medical trial example with four treatments we could carry out six tests among pairs of treatments). The advantage of the ANOVA F-test is that we do not need to pre-specify which treatments are to be compared, and we do not need to adjust for making multiple comparisons. The disadvantage of the ANOVA F-test is that if we reject the null hypothesis, we do not know which treatments can be said to be significantly different from the others — if the F-test is performed at level α we cannot state that the treatment pair with the greatest mean difference is significantly different at level α.

The formula for the one-way **ANOVA** F-test statistic is

$$F = \frac{\text{explained variance}}{\text{unexplained variance}},$$

or

$$F = \frac{\text{between-group variability}}{\text{within-group variability}}.$$

The "explained variance", or "between-group variability" is

$$\sum_i n_i(\bar{Y}_{i\cdot} - \bar{Y})^2/(K-1)$$

where $\bar{Y}_{i\cdot}$ denotes the sample mean in the i^{th} group, n_i is the number of observations in the i^{th} group, $\bar{Y}$ denotes the overall mean of the data, and K denotes the number of groups.

The "unexplained variance", or "within-group variability" is

$$\sum_{ij}(Y_{ij} - \bar{Y}_{i\cdot})^2/(N-K),$$

where Y_{ij} is the j^{th} observation in the i^{th} out of K groups and N is the overall sample size. This F-statistic follows the F-distribution with $K-1$, $N-K$ degrees of freedom under the null hypothesis. The statistic will be large if the between-group variability is large relative to the within-group variability, which is unlikely to happen if the population means of the groups all have the same value.

Note that when there are only two groups for the one-way ANOVA F-test, $F = t^2$ where t is the Student's t statistic.

A Statistical Analysis of a data for Yogic farming and Organic Farming :

The Graphical analysis of the data in Table 1 is shown in the following chart :

Summary of the Data :

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	2	53.62	26.81	134.1522
Column 2	2	14.83	7.415	18.66605
Column 3	2	273	136.5	840.5

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	19380.67	2	9690.333117	29.26655113	0.010765115	9.552094496
Within Groups	993.3183	3	331.1060833			
Total	20373.98	5				

Analysis output :

The *F* ratio 29.26655113 is larger than the *F crit* value 9.552094496. The difference between the data values suggest that the difference is statistically significant. This significance shows that more and more experiments of Yogic farming will lead to better products and better future of farming.

Conclusion :

The above statistical analysis emphasis on the sustainable effects of yogic farming on the nutritive values of food products as well as fertility of the soil. Hence, encouragement to yogic farming can once again get us back the days, when we truly were feeling that 'Jahan dal dal par sone ki chidiya karti hai basera, who Bharat desh hai mera'.

References :

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