

II RESEARCH ON NATURAL FARMING

a. Research projects on Natural Farming

The scientific validation trials on natural farming (NF) are under progress in 12 horticultural crops (tomato, dolichos bean, cluster bean, chilli, coriander, cabbage, marigold, mango, guava, sapota, cashew and custard apple) besides one field crop (black gram). The trials are initiated from 2018 and 2019. The Natural Farming practice are being scientifically validated on all the aspects (growth, yield, and changes in all the soil physico-chemical and biological properties, changes in pests and diseases, quality aspects and economics) in comparison with other practices (organic, farmers' practices and RPP). Besides the NF trials, research scholars (Ph.D. students) are also conducting investigations on natural farming aspects.

Treatment details of Natural Farming trials:

Treatments	Plant nutrition	Plant protection	Remarks
T ₁ : RPP	As per the University RPP	As per the University RPP	Varies with crop
T ₂ : Farmers' Practice	As per the practices followed by the farmers in particular crop.	As per the practices followed by the farmers in particular crop.	This is based on the survey conducted on 20 farmers in an area on a particular crop.
T ₃ : Natural Farming (ZBNF)	<ul style="list-style-type: none"> -Applying Ghanajeevamruta @400 kg/acre before sowing -Treating seeds/seedlings with beejamruta at the time of sowing/planting. -Applying Jeevamruta @ 200 /acre once in every 15 days throughout the crop period -Mulching with crop residues. 	<ul style="list-style-type: none"> -Use of Neemastra, Brahmastra, Agniastra, Dashaparni kashaya (for insect pests) -Use of Shuntiastra, Sour butter milk etc. (for disease control) 	This is as per the practice advocated by Shri Subhash Palekar. He advocated four principles of ZBNF i.e i. Use of beejamruta, ii. Use of Jeevamrutha, iii. Mulching and iv. Waphasa*
T ₄ : Organic Farming	<ul style="list-style-type: none"> -Applying FYM equivalent to recommended nitrogen in addition to recommended FYM, every season -Using biofertilizers (Azospirillum, Azotobacter, Rhizobium etc.) 	<ul style="list-style-type: none"> -Use of Trichoderma, Pseudomonas, Beauveria, Pneumoria, Metarhizium etc. (depending on the occurrence of pests and diseases) -Neem oil, Nimbicidin, Azadiractin etc. 	As per the recommendation of the University

The above treatments are common to all the crops but vary with respect to the quantity and frequency of application (plant protection measures) depending on the occurrence of pests and diseases.

*Waphasa is a condition of soil wherein equal proportion of air and water in soil is held with sufficient amount of humus/organic matter and good soil structure.

Experiment
List of NF trials and trials of research scholars

Sl. No.	Title of the Experiment	Year of start	Location	Remarks
NF Trials				
1.	Validation of farming practices (including NF) in Dolichos bean (<i>Dolichos lablab</i> L.) under Dolichos bean- Tomato (<i>Solanum lycopersicum</i> L.) sequence cropping system	2018-19 (Summer)	RHREC, Kumbapur, Dharwad	Three year data available Continued
2.	Validation of farming practices (including NF) in Cluster bean (<i>Cymopsis tetragonoloba</i> L. Taub.) under Cluster bean- Tomato (<i>Solanum lycopersicum</i> L.) sequence cropping system	2018-19 (Summer)	RHREC, Kumbapur, Dharwad	Three year data available Continued
3.	Validation of farming practices (including NF) in Tomato (<i>Solanum lycopersicum</i> L.) under Cluster bean and Dolichos bean-Tomato sequence cropping system	2019-20 (Kharif)	RHREC, Kumbapur, Dharwad	Three year data available Continued
4.	Validation of farming practices (including NF) in Sapota	2019-20 (Kharif)	RHREC, Kumbapur, Dharwad	Perennial Continued
5.	Validation of farming practices (including NF) in Guava (<i>Psidium guajava</i> L.)	2019-20 (Kharif)	RHREC, Kumbapur, Dharwad	Perennial Continued
6.	Validation of farming practices (including NF) in Chilli (<i>Capsicum annuum</i> L.)	2019-20 (Kharif)	HREC, Devihosur, Haveri	Three year data available Continued
7.	Validation of farming practices (including NF) in Blackgram (<i>Vigna mungo</i> L.) under blackgram-coriander sequence cropping system.	2019-20 (Kharif)	HREC, Devihosur, Haveri	Two year data available Continued
8.	Validation of farming practices (including NF) in Coriander (<i>Coriandrum sativum</i> L.) under blackgram-Coriander sequence cropping system.	2019-20 (Kharif)	HREC, Devihosur, Haveri	Two year data available Continued
9.	Validation of farming practices (including NF) in Cabbage (<i>Brassica oleracea</i> var <i>capitata</i> L.)	2019-20 (Kharif)	HRES, Hidkal, Hukkeri	Three year data available Continued
10.	Validation of farming practices (including ZBNF) in Mango (<i>Mangifera indica</i> L.)	2019-20 (Kharif)	HRES, Hidkal, Hukkeri	Perennial Continued
11.	Validation of farming practices (including ZBNF) in Custard apple (<i>Annona reticulata</i> L.)	2019-20 (Kharif)	HRES, Hidkal, Hukkeri	One year data available Continued

12.	Validation of farming practices (including ZBNF) in Cashew (<i>Anacardium occidentale</i> L.)	2019-20 (Kharif)	HRES, Kanabargi, Belagavi	Two year data available Continued
Experiments undertaken by SRF and Ph.D. Scholars				
1	Effect of dosage and frequency of liquid Jeevamrutha on growth, yield and quality of mango (<i>Mangifera indica</i> L.) var. Alphonso	2019-20 (Kharif)	RHREC, Kumbapur, Dharwad	Two year completed
2	Effect of Jeevamrutha and biofertilizers on growth, yield and quality of mango (<i>Mangifera indica</i> L.) var. Alphonso	2019-20 (Kharif)	RHREC, Kumbapur, Dharwad	Two year completed
3	Effect of dosage and frequency of liquid Jeevamrutha on growth, yield and quality of guava (<i>Psidium guajava</i> L.) var. L-49.	2019-20 (Kharif)	RHREC, Kumbapur, Dharwad	Two year completed
4	Standardization of dosage of liquid Jeevamrutha and Ghanajeevamrutha for higher growth, yield and quality of guava (<i>Psidium guajava</i> L.) var. L-49.	2019-20 (Kharif)	RHREC, Kumbapur, Dharwad	Two year completed
5	Standardization of dosage and frequency of liquid Jeevamrutha application for higher growth, yield and quality of marigold (<i>Tagetes erecta</i>)	2019-20 (Kharif)	HRES, Kanabargi, Belagavi	Three year completed
6	Effect of Ghanajeevamrutha and foliar application of liquid Jeevamrutha on growth, yield and quality of marigold (<i>Tagetes erecta</i>)	2019-20 (Kharif)	HRES, Kanabargi, Belagavi	Three year completed

Inferences:

- There was reduction in yield in natural and organic farming compared to RPP and FP. However, there was gradual improvement in the yield in natural and organic farming over the years.
- Net return and benefit also found lower in natural and organic farming compared to RPP and FP.
- There was improvement in soil physico-chemical and biological properties in natural and organic farming practices.
- Control of pests and diseases under natural and organic farming was found difficult. However, the same can be controlled prophylactically with the use of higher dosage of bioagents and neemstra, brahmastra, agniasttra etc.
- Though the growth in organic farming and natural farming (in some crops like legumes) was found better but, yield reduction in such crops was due to pests and diseases, especially in vegetable crops.

b. Contact person with designation and contact details

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c. Scientific publications or reports published

Interim report submitted to the funding agency (Govt. of Karnataka). Works is envisaged in the month of April/May of this year.

