

**Feed The Future India Triangular Training (FTF ITT) Program
on
Modern Storage Technologies in Agriculture**

Date: 1-15 June 2018 | Venue: ICAR-CIPHET, Ludhiana



**ICAR- Central Institute of Post Harvest Engineering and
Technology (CIPHET)**

Ludhiana – 141008, Punjab State, India

<http://www.ciphnet.in>

About ICAR-CIPHET

The ICAR-Central Institute of Post-Harvest Engineering and Technology (ICAR-CIPHET) was established on 29th December 1989 at Ludhiana, Punjab (India); as a nodal institute to undertake lead Researches in the area of post-harvest engineering and technology appropriate to agricultural production catchments and agro-industries. The institute's second campus was established on 19th March 1993 at Abohar, Punjab and is primarily responsible for conducting research and development activities on fruits and vegetables. ICAR-CIPHET is also headquartering two All India Coordinated Research Projects (AICRPs) viz. AICRP on Post-Harvest Engineering and Technology (PHET) with 30 Centers and AICRP on Plasticulture Engineering and Technology (PET) with 14 Centers.

ICAR-CIPHET is a pioneer organization mandated to undertake lead researches in the area of postharvest engineering and technology appropriate to agricultural production catchment and agro-industries. Being a nodal institute in the field of post-harvest processing, ICAR-CIPHET has developed a national database on post-harvest machinery/ equipment which is available on the institute website and can be continually updated. The institute has widened the horizons of research varying from development of processing machines to electronic gadgets for quality evaluation and maintenance. Apart from developing mechanical tools, we are also striving hard in the direction of providing biological tools for processing and value addition to agro-produce. So far institute has designed and developed more than 45 machineries and 55 processes and technologies in the field of post harvest engineering and technology of agricultural produce.

Available facilities/ laboratories

- Food Testing cum Certification Lab
- Post Harvest Machine Testing Centre
- Agricultural Structures & Environment Control Lab
- Livestock Products Processing Lab
- Surface Plasmon Resonance (SPR) Unit
- Non Destructive Quality Evaluation Lab
- Food Packaging and Transportation Lab
- Bio Process Engineering Lab
- Cleaning, Grading and Drying Laboratory
- Product development and by-product utilization laboratory
- Food quality and safety laboratory
- Bioengineering properties laboratory
- Processing and product development laboratory
- Product Quality Analysis Laboratory

Brief details of the International Training Programme on

" Modern Storage Technologies in Agriculture "

proposed at ICAR-CIPHET, Ludhiana under USAID's & GOI funded "**Feed The Future India Triangular Training (FTF ITT)**" in collaboration with MANAGE, Hyderabad

Title **Modern Storage Technologies in Agriculture**

Date & venue 1-15 June 2018

Duration 15 days

Course Dr. R. K.Gupta, Director, ICAR-CIPHET, Ludhiana, India
Director and Dr. R. K. Vishwakarma, I/c Head, HCP Division, ICAR-CIPHET, Abohar
co-directors Dr. V. E. Nambi, Scientist, ICAR-CIPHET, Ludhiana
 Dr.Ranjeet Singh, Sr. Scientist, ICAR-CIPHET, Ludhiana

Introduction Agricultural and horticultural produce are very important part of human diet. The agricultural and horticultural crops production has been steadily increasing due to advancement in production technology and high yielding varieties development, but improper handling and storage of these commodities results in high losses before reaching to the consumers. Storage is the most important aspect of food supply chain that ensures food security and round-the-year quality food supply of a country. According to World Bank Report, the food grains and perishables wasted due to improper storage could be sufficient to feed one third of world poor population.

Quantitative as well as qualitative losses occur during storage due to physiological changes, insects, rodents, and micro-organisms. Storage conditions, environmental factors, gas composition, management practices etc. Affect the shelf life and quality of horticultural produce to great extent. Large number of insect pests has been reported to be associated with stored grains, which is directly related to geographical and climatic conditions. Hence, the present course is proposed considering the vital need of capacity building and trained manpower in modern and effective storage techniques for agricultural and horticultural commodities. Special emphasis is given for design and maintenance of on-farm low cost storage structures for food grains and evaporative cooled storage structures for perishables.

Objectives

- Introduce the concept of different storage techniques/systems available for major food grains and horticultural produce storage in developing countries.

- Design, construction and management of low-cost evaporative cooled storage structures for perishables.
- Sensitizing the participants about insect control, fumigation and other quality control of stored grain ecosystems
- Demonstrate the bulk storage systems with effective handling of food grains, Controlled Atmosphere (CA) storage & Modified Atmosphere storage for horticultural produce.
- Visit to mechanized storage systems (Bulk/ Bin storage) and bag storage systems, CA storage, multi-commodity cold storage, pack house presently available and interaction with the stakeholders.

Key Focus
areas of the
training
Module

The training course shall give overall perspective about the different storage systems available in the developing countries especially in African and Asian countries and recent developments in handling and storage. Due emphasis is given on concepts of stored grain ecosystems, quality and insect control in the stored grains, different type of fumigation methods/systems, fumigation standards, plant quarantine operations etc. Physiology of horticultural produce will be explained to manage optimum storage conditions and quality assurance. Design and operational aspects of evaporative cooled storage, cold storage, modern methods like CA storage, delayed ripening processes, multi-commodity cold storage systems, etc are covered. The concept of cold chain and its management will be described to handle horticultural produce efficiently. The training also covers the role of ripening chambers, pack-house operations and gas composition controls in efficient supply chain management of perishables.

The training also gives overview of bulk grain handling, transportation and storage, suitability of bulk storage, convenient of bulk storage over bag storage, issue/ problems with the existing system of storage in the developing countries. Hands-on exposure would be given to the trainees about the unit operations related to storage of food grains and horticultural produce. The course will also have the study visits of different storage systems currently being practised in India. About 50% time shall be devoted in lecture-cum-interaction sessions, 50% time on hands on practices cum field demonstrations.
