VIỆN CƠ ĐIỆN NÔNG NGHIỆP VÀ CÔNG NGHỆ SAU THU HOẠCH

Vietnam Institute of Agricultural Engineering and Post-harvest Technology

No. 60 – Trung Kinh Str. - Trung Hoa -

Cau Giay Dist. - Ha Noi

Tel: (+84.4) 38689187/38687884

Fax: (+84.4) 38689131

E-mail: viaep2004@yahoo.com

Functions

VIAEP is a key national scientific and technological institution in agricultural engineering and post-harvest technology.

Tasks

1. Basic Research
2. Applied Research
3. Manufacturing & Testing of Agricultural Machines
4. Technology Transfer
5. Control and Evaluation of Agro-product Quality
6. Education & Training
7. International Cooperation

Organization structure

VIAEP employs 359 staff (287 full time):

1 Professor

3 Associate Professors

2 Doctors of Science

26 PhD.

59 Masters

160 Bachelors and others

Location and Departments

Headquaters:

No. 60, Trung Kinh Str. , Trung Hoa,

Cau Giay Dist. , Hanoi

Experimental premises, Gia Lam Dist., Hanoi

Center for Research and Technology Transfer in Agricultural Engineering in the Central (in Hue City)

Sub-Institute of Agricultural Engineering & Post-harvest Technology (in HCM City)

Functional Departments

1. Dept. of Science and Int'l Cooperation
2. Dept. of Administrative Organization & Personnel Management
3. Accounting Dept.
4. Training Dept.

Research Departments

1. Dept. of Measurement and Automation
2. Dept. of Animal Husbandry Mechanization
3. Dept. of Post-harvest Microbiology
4. Dept. of Technology for Food Preservation

National Laboratory VILAS

National Electro-Mechanical Laboratory VILAS-019

Tel: +84.4. 38686346, Fax: +84.4. 38689131, E-mail: vilas019@hnn.vnn.vn / vilas019@gmail.com

Field of testing:

° **Mechanical objects:**

- Engines, tractors, vehicle, combined machinery for agriculture, forestry, irrigation, etc.
- Irrigation pumps, fans, etc.
- Devices for agro-products processing and air conditioning
- Agro-production environment and related issues
- Fixed and moving objects, and
- Related objects of these items.

° **Electrical objects:** systems of low voltage distributors, machines and devices serving in agro-forestry and fishery, and related objects.

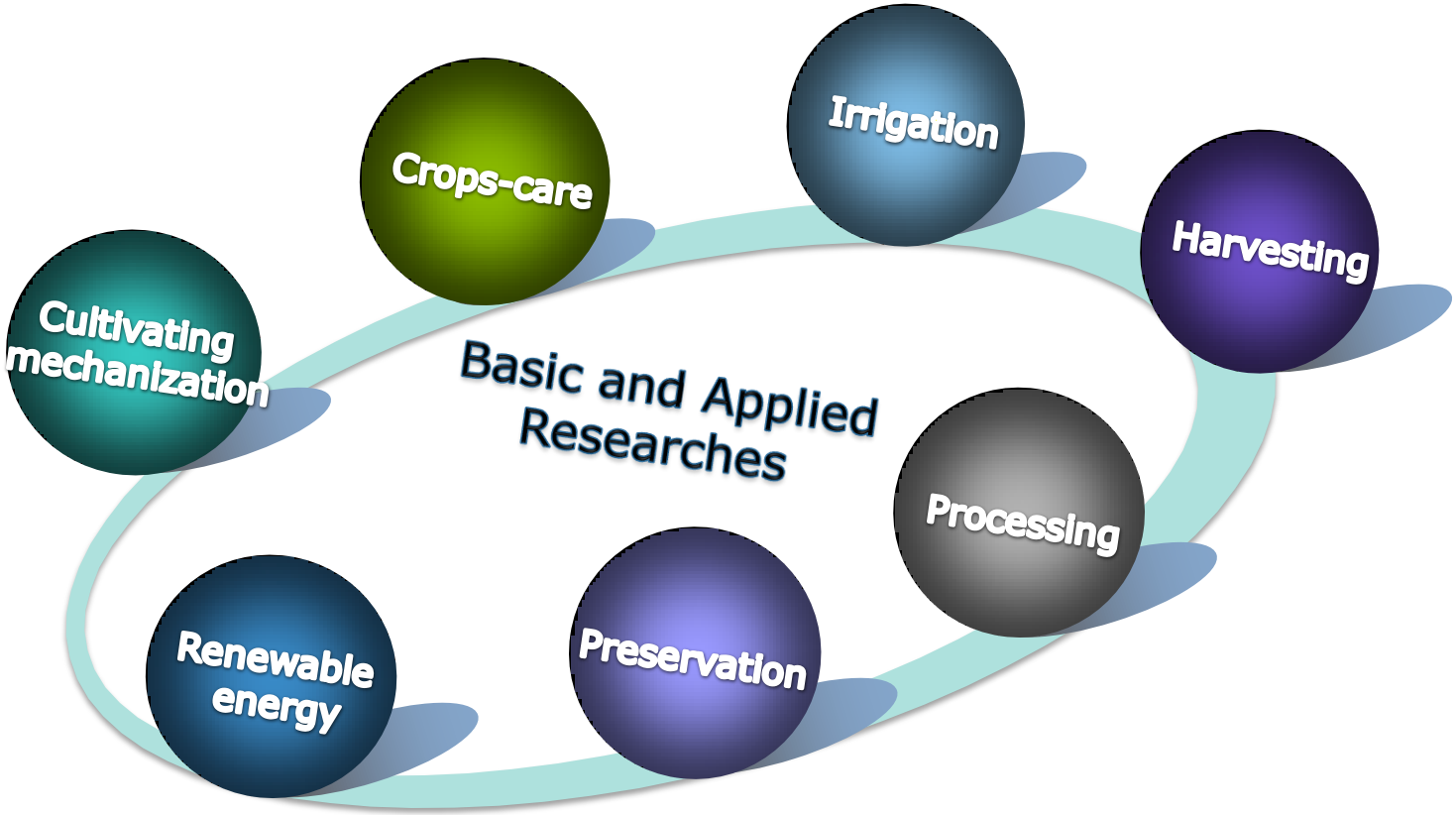
Sub-institute and Centers

1. Sub-Institute of Agricultural Engineering & Post-harvest Technology (in HCM City)
2. Center for Research and Technology Transfer in Agricultural Engineering in the Central (in Hue City)
3. Center for Technology Transfer and Consultancy on Investment
4. Center for Testing and Evaluation of Machinery and Equipment
5. Center for Research and Control of Food Quality
6. Center for Research of Agricultural Machinery and Aero-hydraulic Machines
7. Center for Research on Processing of Agro-products and Foodstuff
8. Center for Development of Agricultural Engineering
9. Center for Research and Technology Transfer of Aquaculture Feeds

SCIENCE-TECHNOLOGY RESEARCH ACTIVITIES

Basic and Applied Research

- Research, design and manufacture of machines and equipment;
- Establishment of technological processes



Cultivation

Research and development of all kinds of machines for land preparation for rice, maize, sugar cane and industrial crops

Cultivation

Study and application of various machines to meet cultivation requirements and conditions of different zones across Vietnam

Cultivation

Images of highland and submerged land preparation

2-wheel power tiller

Improved 4-wheel tractor for water field operation

Iron cage wheel

Cultivation

Images of simple devices for rice seedling production

Hand-propelled rice sowing tool

Rice sowing equipment mounted to tractor

Cultivation

Images of simple devices for rice seedling production

Soil crushing and sieving machines

Cultivation

Images of simple devices for rice seedling production

Soil-fertilizer mixing machine

Cultivation

Images of simple devices for rice seedling production

Manual implement and railways for spreading soil and seeds

Cultivation

Images of simple devices for rice seedling production

Hand implement for tray rice sowing on the yard

Cultivation

Images of advanced devices for rice seedling production

Rice seedling comprehensive production line

Cultivation

Tray rice seedlings brought to transplant

Trays filled with soil and seeds

Material	plastic
Dimension (LxWxH), cm	56 x 23 x 3
Bottom type	porous
Area supply, trays/360 m^2	12

Greening and hardening

- Placing the trays in the nursery

-Watering with fresh non-contaminated water by using appropriate pump sprinkler

Cultivation

Rice transplanter MC-6-250

- Engine power, HP	4
- Fuel consumption (Diesel), l/ha	4-5
- Capacity, m2/h	1,200-1,500
- Stripe transplanting, row	6
- Row-to-row spacing, cm	25
- Hill-to-hill spacing, cm	12 or 14
- Number of seedlings per hill	2-3
- Weight, kg	250

Cultivation

Sugarcane cultivation

Special small tractor for Sugarcane

Inter-row Cultivation MK-CS

Cultivation

Sugarcane cultivation

Rotavator

Fertilizer distributor

Root cutter

Crops-care and Irrigation

Design and manufacture of comprehensive systems of tilling, sowing, crop-care and irrigation in the fields and in greenhouses

Crops-care and Irrigation

Design and manufacture of:

- **All kinds of pumps as hand pump, high pressure spiral pump, axial-flow pump, centrifugal pump**
- **Systems of sprinkling, drop-type, absorbing irrigation widely applied for different areas of lowland, highland, mountains, etc.**

Crops-care and Irrigation

Images of irrigation devices

Axial pumping station
40,000m^3/h – 10-1,500kW

Small axial pumping station
6,000m^3/h – 4-120kW

Crops-care and Irrigation

Images of irrigation devices

Mist-type irrigation

Sprinkler irrigation

Floating pumping station
1,000m³/h; 150kW

Hand pump TL
Capacity: 30-40 l/min.
Lifting depth: 8-14 m

Harvest

Design and manufacture of all kinds of reapers

Capacity: 0.25 ha/h

Harvest

Design and manufacture of rice combine harvesters

Capacity: 2-3 ha/day

Harvest

Ground nut harvester

Capacity: 0.2-0.3 ha/h

Harvest

Maize harvester

Capacity: 0.2-0.3 ha/h

Harvest

Sugarcane harvester

Capacity: 0.3ha/h

Sugarcane combine harvester SHC–0.2A

Capacity: 0.2 ha/h

Harvest

Main parts of a sugarcane harvester

Harvest

Simple sugarcane harvester

Harvest

Sugarcane farm and harvester for the Mekong River Delta

Capacity: 0.2 ha/h

Harvest

Rice axial-flow thresher DLH-1.5

Harvest

Maize shelling tools and machines

Hand maize sheller
Capacity: 50-80kg/h

Maize Sheller TN 4
Capacity: 4 tons/h

Maize Sheller TN 3.5
Capacity: 3.5 tons/h

Maize shelling tools and machines

Maize ocrea peeler and sheller BBTH 2,5 with high moisture content

Capacity: 2-3 tons/h (with ocrea) or 3-4 tons/h (without ocrea)

Moisture content of corn-on-the-cob: 30-35%

Dryers

Drying devices

Simple dryer SH 1-200

Banana dryer

Infra-red dryer

Batch bed dryer

Dryers

Automatic tower-type dryer

Dryers

Herbal multipurpose dryer using combination of heat-pump and in-frared drying methods

Solar dryer

Processing

Model of pre-processing and storage of semi-products (puree, paste) **for different fruits** (apricot, plum, tomato, custard, guava, etc.) **as raw material for the Fruit Juice Processing Centre**

Processing

Processing technology for pickled baby cucumber, baby corn in brine, mushroom in brine, and litchi and longan in sirup, etc.

Vacuum frying Technology and equipment lines for potato, jackfruit, banana, taro, etc.

Processing

Technology of fruit vine production at household, small and concentrated scales 100,000 liter/year

Wine made from cashew flesh

Processing

Processing lines for seed, animal feed, coffee, green tea, cassava starch, soft drinks and many other products have been installed and operated, aiming at improving agro-products value.

Processing

Automatic control system

Processing line of animal feed

Capacity range, tons/h: 2-3, 5-7, 10-12, 15-16, 20-25 and 30

Processing

Complete line for grain seed processing

Capacity: 1-2 tons/h for rice, 1.5-2.5 tons/h for maize

Processing

Production of functional food

Extractors using ultrasonic waves and vacuum to extract, dry and collect derivatives from herbal mushrooms

Processing

FucoGlucan contains extract of fucoxanthin from sargasuum

Processing

Equipment for extracting sulforapahne from mustard green family using ultrasonic waves

Sulfo-vina and Indole-3-vina contain sulforapahne

Processing

Complete line for producing turpentine

- **Scale:** 5,000 tons of products per year
- **Distillation time:** 60 min./batch
- **Using environmentally-friendly technology**
- **Mainly exporting to USA, Japan and South Korea.**

Storage

In the past recent years, storage of agro-products and foodstuff has been improved and gradually completed. Thanks to application of advanced devices and proper technologies post-harvest losses have remarkably reduced and value of agro-products has been getting better and better

Storage

Devices and techonologies for storage of cereals

At centralized scales

At household scale

Devices and techonologies for storage of vegetables

Setting up an Excellence Model, technological processes and standards for storage of fresh vegetables, including:

-**Leafy vegetables:** cabbage, cauliflower/broccoli, sweet mustard greens, brassica juncea, bok choi, basella alba

-**Root vegetables**: kohlrabi, potato

-**Fruit-vegetables**: tomato, cucumber, French bean

-**Spicy vegetables**: onion, garlic

Financed by UNIDO

Images of the Excellence Model for Harvesting, Packing House Operations and Storage of Vegetables

A corner of the Packing house

Storage

Images of the Excellence Model for Harvesting, Packing House Operations and Storage of Vegetables

Ozone bubbling wash

Photovoltaic panels

Storage

Images of the Excellence Model for Harvesting, Packing House Operations and Storage of Vegetables

Material receiving chamber with cooling pads

Airocide built-in cooling store

Hardness testing of fruit-vegetables

Some examples of storage of typical vegetables at the Excellence Model

Cabbage

Wrapped in a 0.01mm- or 0.02mm-thick PE film and stored at:

- Normal temperature within 5 days with a loss rate < 10%
- 15°C and 80-90% RH within 10 days with a loss rate <10%
- 2-3°C and 90-95% RH within 60 days with a loss rate <10%

Kohlrabi

Contained in 0.04mm-thick OPP bag and stored at:

- Normal temperature within 4-5 days with a loss rate < 1%
- 15°C within 5-6 days with a loss rate <0.5%
- 2-3°C within 20 days with a loss rate <0.5%

Storage

Some examples of storage of typical vegetables at the Excellence Model

Tomato

Treated in ozone bubbling water, contained in 0.03mm-thick LDPE bag and stored at 10-15° C within 30-35 days with a loss rate < 5%.

Green pumpkin

Wrapped in 0.01mm-thick PE film or contained in 0.02mm-thick LDPE bag and stored at:

- Normal temperature within 35-40 days with a loss rate < 10%
- 10-12° C within 55-60 days with a loss rate < 5%

Onion

Contained in PP-net bag and stored in a cool, airy, dry place away from direct sunlight within 100-110 days with a loss rate < 15%

Devices and techonologies for storage of fruit

Orange

- Scale: 5-20 tons/household
- Condition: At normal temperature, anti-spoilage treatment, application of ethylene AR3 absorbent
- Storage time: 60 days
- Loss rate: 9%

Devices and techonologies for storage of fruit

Thanh tra pomelon

A special type of grape-fruit grown in Hue area, the Central of Vietnam

- Scale: 500kg/household

- Condition: At normal temperature, anti-spoilage treatment and application of ethylene AR3 absorbent

- Storage time: 60 days

- Loss rate: 7%

Devices and techonologies for storage of fruit

Plum

- Scale: 200-500kg/household
- Condition: At normal temperature, heating treatment, application of ethylene AR3 absorbent
- Storage time: 15 days
- Loss rate: 10%

Devices and techonologies for storage of fruit

Bamboo shoot

Stored as raw material for processing

- **Scale**: **300 tons/year**
- **Condition**: **At normal temperature, using fermenting method**
- **Storage time**: **180 days**
- **Loss rate**: **5%**

Devices and techonologies for storage of fruit

Longan

- Scale: 500-1000kg/household
- Condition: At a cooling temperature, treated with quick cool and SO_2, contained in 0.05-mm-thick PE film
- Storage time: 25 days
- Loss rate: 9%

Devices and techonologies for storage of fruit

Litchi

- Scale: 400tons/crop
- Condition: At a cooling temperature, application of ethylene AR3 absorbent, packaged in 0.04-mm-thick LDPE film
- Storage time: 30 days
- Loss rate: 7%

Devices and techonologies for storage of fruit

Dragon fruit

- Scale: 2 tons/h
- Condition: At a cooling temperature, anti- spoilage treatment, packed in 0.05-mm-thick PVC film
- Storage time: 42 days
- Loss rate: < 10%

Mainly for export to European countries

Devices and techonologies for storage of fruit

Mango

- Scale: 10-40 tons/day/household
- Condition: At normal temperature, heating treatment, packed in 0.03-mm-thick LDPE film
- Storage time: 7 days
- Loss rate: 10%

Devices and techonologies for storage of fruit

Persimmon

- Scale: 500kg/household
- Condition: At normal temperature, anti-spoilage treatment, application of ethylene AR3 absorbent
- Storage time: 90 days
- Loss rate: 9%

Storage

Devices and techonologies for storage of fruit

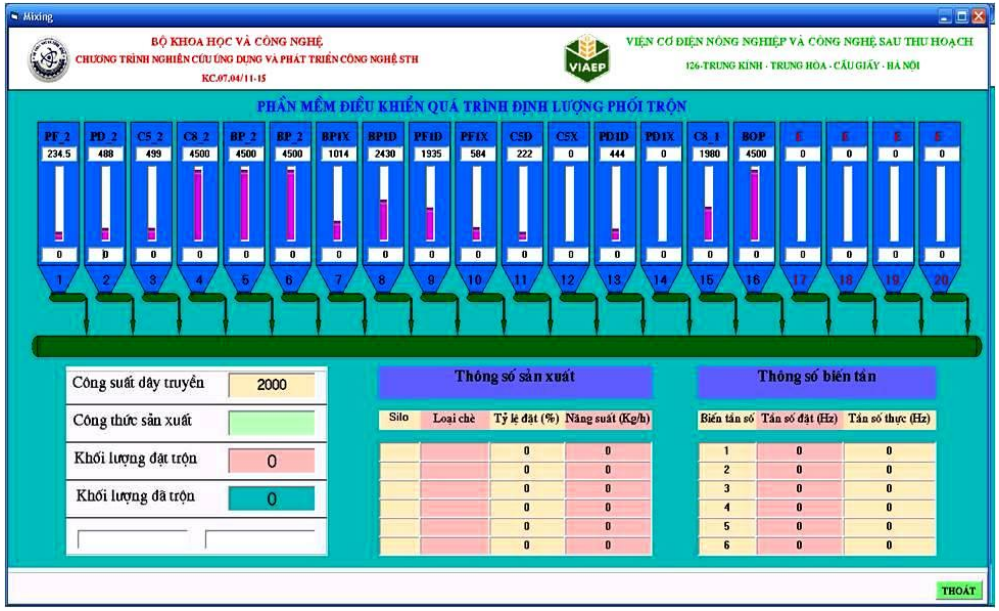
Flower

- Scale: 200 million branches/year
- Condition: At cooling temperature, packaged in 0.04-mm-thick LDPE film
- Storage time: 7-20 days
- Loss rate: 8%

Mainly for export

Storage

Silo system for black tea storage using heat-pump drying in modified atmosphere

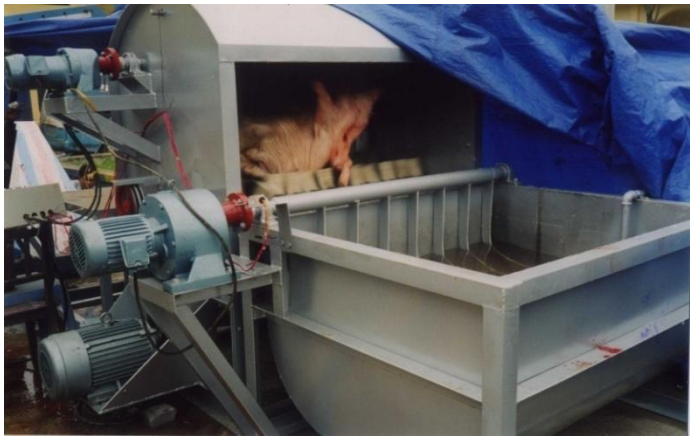


Interface for monitoring of mixing process

Equipment for slaughtering pigs and poultry

Manufacture and installation of slaughtering lines for pig, chicken in provinces of Vietnam

Scale: 150-250 heads/h



Scale: 20-30 heads/h

Equipment for Aquaculture

Design and manufacture of different types of equipment for aquaculture

Milling machines of feed for aquaculture

Pond bed dredger

Equipment for Aquaculture

Design and manufacture of different types of equipment for aquaculture

Paddle wheel aerators

International Cooperation

VIAEP has established regular relationship with the International Organizations:

FAO, IRRI , UNIDO,

JICA, ACIAR, IFPRI,

CiAT, AusAID, AIT, IUFoST,

and

with specialized Institutions of many countries worlwide

International Cooperation

VIAEP has been being:

-The coordinating agency for Science Technology on ASEAN Food and Foodstuff

-An official Member of the Centre for Sustainable Agricultural Mechanization (CSAM) - Former UNAPCAEM, and

-An Official Member of Federation of Institutes of Food Science and Technology in ASEAN (FIFSTA)

International Cooperation

Some big international projects have been developed by VIAEP in recent years:

-Project under the Auspice of US. Government through the Wheat Protocol: "Strengthening Capacity to Analise Some Chemical Residues in Agro-Products" (2003-2009)

-Vietnam-Cuba Technical Cooperation Project: "Transferring Agricultural Machinery for Rice Production" (2003-2013)

- ADB project: "Improving Livelihood of Poor Farmers through Post-Harvest Technology" financed by Japan Fund for Poverty Reduction for Vietnam and Cambodia (2005-2008)

International Cooperation

- Vietnam-Thailand Cooperation project: "Post-Harvest Handling and Marketing Horticultural crops" (Implemented by SIAEP, 2005-2006)
- FAO project: "Village Level Processing-Empowerment through Enterprise Skill Development" for Vietnam, Lao PDR and Myanmar (Mar. 2006 to Sep. 2007)
- UNIDO Project: "Strengthen the supply capacity of the fruit and vegetable sector by applying proper technologies along the value chain" (2013-2016)

International Cooperation

Some activities of transfer of machinery, equipment and technology in Cuba

International Cooperation

Some activities of transfer of machinery, equipment and technology in Cuba

International Cooperation

Some activities in Excellence Model for Harvesting, Packing house operations and Storage of Vegetables donated by UNIDO

International Cooperation

Some activities in Excellence Model for Harvesting, Packing house operations and Storage of Vegetables donated by UNIDO

VIỆN CƠ ĐIỆN NÔNG NGHIỆP VÀ CÔNG NGHỆ SAU THU HOẠCH

Vietnam Institute of Agricultural Engineering and Post-Harvest Technology

Thank You !

Tel: (+84.4) 38 689187/ 37823026
Fax: (+84.4) 38 689131
E-mail: viaep2004@yahoo.com
Webpage: www.viaep.org.vn