

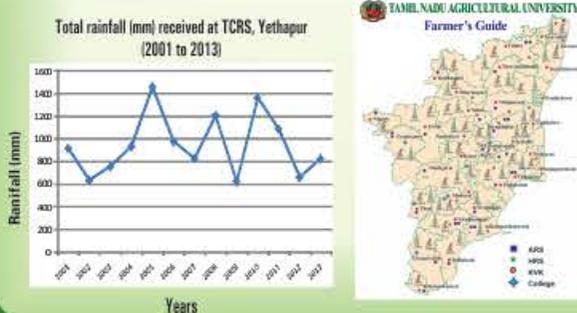
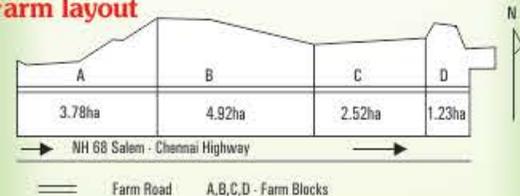
## Tapioca and Castor Research Station, Yethapur (TCRS)

Establishment : 1.4.98  
 Area : 11.25 ha  
 Place : Yethapur  
 Attur (Tk), Salem Dt.  
 Support : Fully financed by Govt. Of Tamil Nadu  
 Location : Located in North Western Zone of Tamil Nadu on the Salem-Ulundurpet NH 68 (35km away from Salem)



Latitude : 11°35'N  
 Longitude : 78°29'E  
 Altitude : 282m above MSL  
 Climatic Classification : Semi Arid Tropic  
 Mean Annual Rainfall : 850 mm  
 Crop Growing Period : 134 days from 27<sup>th</sup> (July 2-8) to 45<sup>th</sup> (Nov 4-11) standard weeks  
 Mean Maximum Temp.: 29.4°C to 38.0°C (Nov and May)  
 Mean Minimum Temp.: 18.6°C to 28.4°C (Jan and May)  
 Soil type : Fine, mixed Isohyperthermic Typic Rhodustalf

### Farm layout



## Mandate

- To undertake basic strategic applied thrust areas of research in tapioca and castor
- To act as a lead centre for scientific information and to coordinate farmers problem solving issues in tapioca and castor
- To introduce new technologies for increasing the productivity of tapioca and castor
- To act as a centre for training the farmers and extension functionaries
- To provide consultancy service on crop management and crop protection in tapioca and castor.

## Objectives

- Genetic improvement of tapioca and castor for hybrid vigour, productivity, quality, earliness, drought tolerance, resistance to pests and diseases, high starch and high oil content
- Development of new agro-techniques for higher productivity and to solve the field problems in tapioca and castor
- Studies on different physiological, bio-chemical and economic aspects of tapioca and castor
- Development of post-harvest technology, value added products and bio-fuels survey, monitoring and management of major pests and diseases in tapioca and castor

## Schemes in operation and staff position

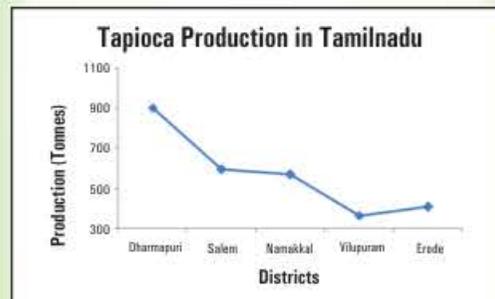
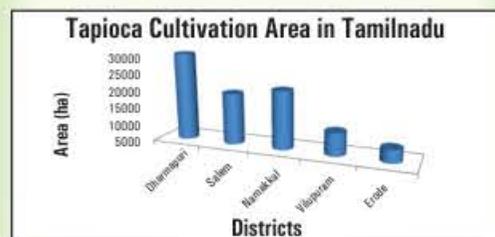
S. No.	Schemes	Staff position										Total
		Prof.	Asst. Prof.	JRF	AAO / JAO / Agrl. Supervisor	Supervisor (Mechanic)	Supdt.	Asst.	Lab. Tech.	Driver	DA	
1.	TCRS- Main Plan Scheme	8	5	-	-	1	1	1	-	1	1	16
2.	AICRP - Castor	2	2	-	1	-	-	-	3	-	-	8
3.	AICRP - Tuber crops	-	1	-	1	-	-	-	-	-	-	2
4.	ICAR - CCP C	-	-	-	2	-	-	-	-	-	-	2
5.	NADP Tapioca	-	-	2	-	-	-	-	-	-	-	2
6.	MRTT sugarcane	-	-	1	-	-	-	-	-	-	-	1
7.	PLD Castor	-	-	-	-	-	-	-	-	-	-	-
8.	PLD - Tribal Sub Plan	-	-	-	-	-	-	-	-	-	-	-
9.	NADP - Blackgram	-	-	-	-	-	-	-	-	-	-	-
10.	NABARD - Cassava	-	-	-	-	-	-	-	-	-	-	-
Total		8	8	3	4	1	1	1	3	1	1	31

## Crop Scenario

### I. Tapioca

Tapioca is an important tropical tuber crop in India, it is cultivated mainly in Kerala, Tamil Nadu, Karnataka and Andhra Pradesh. Kerala and Tamil Nadu account for about 80 per cent of

the total acreage of the crop in India. In Tamil Nadu, tapioca is cultivated in an area of 1.96 lakh hectares with the production of 38.81 lakh tonnes. It is mainly cultivated in Salem, Namakkal, Erode, Cuddalore, Villupuram, Dharmapuri and Kanyakumari districts of Tamil Nadu. Tapioca finds application as a raw material for starch extraction in India. Over 800 starch and sago factories spread over the Salem, Erode, Namakkal and Dharmapuri districts of Tamil Nadu are flourishing in the manufacture of starch and sago. Dharmapuri district stands first in area and production in Tamil Nadu because of the soil and climatic condition prevailing in this district. Tapioca starch finds application principally for sizing of yarn textile industry and in paper industry.

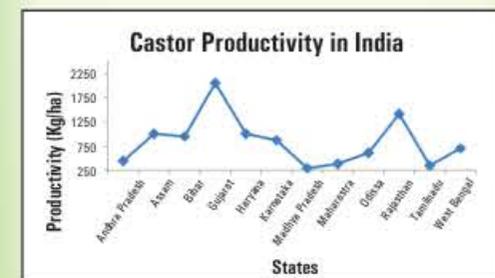
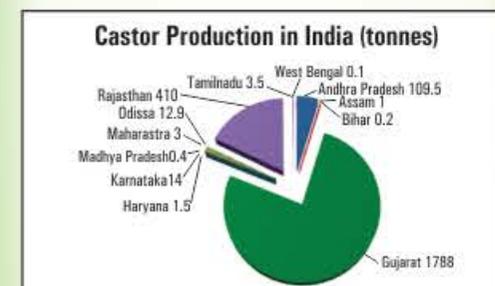
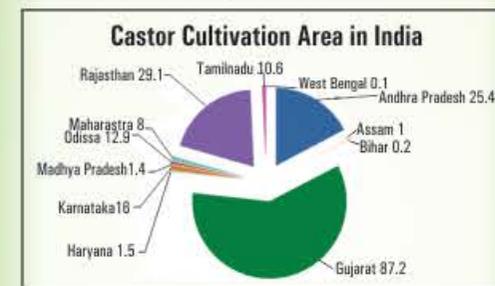


## II. Castor

Castor is an important non-edible oilseed crop of India, having immense industrial and commercial value. India is the largest producer of castor in the world (7.7 lakh tonnes obtained from 7.86 lakh hectares, with 68 and 76 per cent share in the castor area and production, respectively) and earning nearly Rs.4000 crores of foreign exchange annually through export. Castor productivity in India is more than the world average and it ranks first among the major producing countries such as china and Brazil. Castor provides important industrial oil, which is completely biodegradable. Castor oil is used for deriving a number of industrial products viz., dye, detergents, plastics, printing ink, linoleum, leather, ointment, polishes, surface paints, adhesives, lubricants and hydraulic fluids. Castor oil contains 85-90 per cent of

naturally occurring Ricinoleic acid which makes it economically important. Ricinoleic acid provides the viscosity and density to the Castor oil. The Castor cake is used in agriculture as organic manure as it is a rich source of nitrogen. In eri-silk producing areas, castor leave are fed to eri-silk worms. Castor oil is also widely used for its medicinal properties.

Tamil Nadu is an important castor growing state in India, with an area of 14,000 hectares. Major castor producing districts are Salem, Namakkal, Erode, Dharmapuri and Perambalur. It is note worthy to mention that the castor registered highest growth rate in terms of production and productivity during last two decades as compared to other agricultural crops. The spectacular progress in terms of area, production and productivity in castor is due to the development of hybrid castor.



## Current activities

### Research

- Maintenance and evaluation of tapioca germplasm (364 entries) and castor germplasm (450 entries) for development of high yielding varieties in tapioca and hybrids in castor
- INM and weed management studies in tapioca and castor
- Drip fertigation techniques in tapioca and castor
- Developing cassava tonic for improving yield, starch content and reducing the CMD incidence in tapioca
- Developing wilt resistant genotypes in castor
- Developing processing and value addition techniques in tapioca



### Extension

- Front line demonstration in hybrid castor
- Multi location trials for evolving new genotype in castor
- Popularizing castor with onion intercropping systems under drip fertigation.
- Survey and monitoring of tapioca and castor pests and diseases and developing IPM techniques
- Developing model villages with crop demonstrations in SRI, maize and pulses, precision farming, information education C and capacity building programmes
- Farm advisory services through e - Velanmai
- Promoting agriculture allied sector for additional income and social recognition
- Dissemination of technologies through mass media, exhibition, annual reports, booklets, pamphlets and leaflets.
- Solving field problems



**Mass production & distribution of papaya mealybug parasitoid (*Acerophagus papayae*) to control the mealybug incidence in tapioca**

- ★ The mealybug infestation level was observed to be high (40-50%) in all the places surveyed
- ★ Nucleus culture of *Acerophagus papayae* maintained at TCRS, Yethapur using potato sprouts in the laboratory
- ★ Mass production of *Acerophagus papayae* carried out in net house at TCRS, Yethapur
- ★ 3 lakh numbers of parasitoids issued to 1149 farmers covering an acreage of 3500 acres.
- ★ The parasitoid mass produced in the lab will also be released as inoculative release.



**Trainings**

- ★ Hybrid castor seed production
- ★ Improved cultivation techniques in tapioca
- ★ Developing microenterprises and entrepreneurship through inculcating the developed techniques in tapioca and castor.

**Achievements**

**Varieties / Hybrids Released**

**1. Yethapur Tapioca -1**

Tapioca Yethapur-1 is released during the year 2013. The tuber yield is 49.5 t/ha with high starch content (28%) and suitable for irrigated and rainfed condition. Moderately resistant to cassava mosaic virus disease. It can be cultivated in Salem, Erode, Namakkal, Perambalur, Dharmapuri and Cuddalore districts in Tamil Nadu.



**2. Castor Hybrid YRCH -1**

The YRCH 1 castor hybrid was released during the year 2009. This is one of the first hybrid released from TCRS, Yethapur with an average yield of 1861 kg/ha under rainfed ecosystem and oil content 49 per cent with the duration of 150-160 days. Suitable for rainfed and areas of limited irrigation potential which is most popular among the castor growing farmers in Tamil Nadu.



**Technologies Developed**

**1. Tapioca**

- Drip fertigation in Tapioca** - Fertigation with 75% RDF at 100% CPE recorded maximum tuber yield of 35.40 t ha<sup>-1</sup> with a starch content of 28.50%. 
- Weed management in Tapioca** - Black polythene mulch records maximum tuber yield (29.50 t/ha) and starch content (26.50%) with highest B:C ratio 5.7. 
- Standardization of low input technology for Tapioca** - Green manuring (daincha) @ 50 kg/ha + RD of K + 50% RD of NP + *Azospirillum* (5 kg/ha) + *Phosphobacteria* (5 kg/ha).

**2. Castor**

- Castor intercropping with onion under irrigated condition** - Ideal cropping system which records maximum B: C ratio of 3.5 
- Castor designer seed for improving yield under rainfed condition** 
- Yield maximization in castor through improving pistillate flower production using plant growth regulator (PGR) consortia (Castor Gold)** 
- Management of Botrytis grey mold of castor** - Foliar application of carbendazim (0.1%) at 45 and 60 days after sowing is recommended.

**Awards / Medal / Honours Received**

- ★ Best AICRP-Castor Centre Award during 2011 for significant research contribution for enhancing castor area and production 
- ★ Best technical bulletin award' 2000 at TNAU, Coimbatore.
- ★ Best stall award for TCRS, Yethapur in state level farmers day' 2011 at TNAU, Coimbatore
- ★ Best live sample award -Tapioca yethapur1 during Salem Agri Fair'2012
- ★ Best stall award for TCRS, Yethapur during Salem Agri Fair'2013

**Externally funded projects obtained**

- ★ Enhancing the livelihood of tapioca tribal farmers of Salem district funded by NADP, Tamil Nadu.
- ★ Development of wilt resistant heterotic gene pool in castor (*Ricinus communis* L) through induced mutagenesis funded by Board of Research in Nuclear Sciences (BRNS), Mumbai.
- ★ Technological empowerment and sustainable livelihood security of tribal women through agricultural farm productivity and employment generation activities in Kalrayan hills of Tamil Nadu funded by Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India, New Delhi.
- ★ Generating secured income for farm women through dissemination of hybrid castor production technology funded by Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India, New Delhi.
- ★ Demonstrating the efficacy of foliar spray of cassava tonic in Erode, Salem and Namakkal district funded by NABARD-FIPF, Mumbai.
- ★ Training on popularization of improved agro techniques for tapioca & castor in Salem district funded by NABARD, Chennai.
- ★ Popularization of SSI technology in sugarcane funded by NRTT.

**Products for sale**

- ★ Tapioca setts YTP 1, CO (TP) 4
- ★ Cassava tonic
- ★ Castor hybrid seed - YRCH 1
- ★ Castor variety seed- TMV5
- ★ Castor Gold
- ★ TNAU Coconut tonic
- ★ Bio control agents (*Trichoderma viride*; *Pseudomonas fluorescence*)
- ★ Mushroom spawn
- ★ Vermicompost
- ★ Panchakavya

**Future Programmes**

**Research**

- ★ High yielding and high starch content tapioca variety H740/92 was evaluated under variety trials viz., IET, URT & MLT. This variety has been proposed to release. 
- ★ There are about 364 germplasm accessions are being maintained at TCRS, Yethapur. Germplasm has been collected from traditional and non-traditional areas of Tamil Nadu and evaluated continuously for tuber yield, starch content and incidence of cassava mosaic disease 
- ★ One promising wilt resistant high yielding castor hybrid YRCH 1116 and castor variety YRCS 1205 are promoted to Multi Location Testing.

**Extension**

- ★ Introduction of tapioca / castor in potential non-traditional areas of Tamil Nadu.
- ★ On farm trials on improved technologies developed for mandatory crops
- ★ Front line demonstrations on hybrid castor
- ★ Dissemination of technologies through mass media and publications
- ★ Farm advisory service for solving the field problems

**Trainings**

- ★ Popularization of improved agro techniques for tapioca and castor
- ★ Precision farming techniques in high value crops
- ★ Hi - tech nursery techniques in horticulture crops

For more details and information, please contact:

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**2014**

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