



# ICAR-CTRI

## News



**ICAR - CENTRAL TOBACCO RESEARCH INSTITUTE - 533105, A.P.**

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### From the Director's Desk



#### **Broomrape Eradication in Tobacco Remains Elusive – Need for Innovative Integrated Management Strategies**

Broomrape (*Orobancha spp.*) is a root-holoparasitic angiosperm lacking root system and photosynthetic competence and derives total nourishment from host plants (also angiosperms), mainly in the families of Solanaceae, Brassicaceae, Fabaceae and Asteraceae. Broomrape has emerged as serious biotic stress with devastating effect on tobacco production in India. The *Orobancha* caused damage to tobacco varies widely from negligible to complete crop failure depending upon the magnitude of infestation, weather factors, reaction of host, and soil and crop management practices.

In the recent past, the *Orobancha* infestation has become widespread threatening sustainable production of tobacco of all types, particularly FCV grown on contrasting soils and in both rainfed and irrigated conditions. Tobacco plants infected by this parasite show symptoms of paleness, wilting and necrosis of leaves and thus result in loss of leaf yield and quality to a variable degree depending upon the time and severity of infestation. The fact that *Orobancha* (parasite) infection is a complex process taking place underground and the damage to tobacco (host) occurs prior to diagnosis of infection makes it difficult to develop effective control measures. Broomrape's idiosyncratic features such as high fecundity, very small sized seed, easy mode of seed dispersal, seed viability and longevity etc., make parasite eradication strategies ineffective and expensive.

Over the decades, a great deal of research on *Orobancha* in many crops including tobacco yielded vast scientific knowledge on myriad aspects of parasite's lifecycle covering seed phase (germination in response to chemical signalling from host plants), parasitic phase (establishing organic link with and drawing nourishment from host), and emergence and reproductive phase. Based on the understanding of points of weaknesses/vulnerability in parasite's life cycle, several control/management strategies were developed to minimize crop yield and quality. Though control measures are site and crop specific, they commonly include physical (soil tillage, solarisation, irrigation, weeding etc.), chemical (use of germination stimulants, herbicides etc.) and biological (cropping systems, trap crops, biocontrol agents, resistant/tolerant varieties) methods. Despite the fact that several potential control measures are developed, a complete eradication of this parasite continues to remain elusive. Further, it has often been reported that any control method applied alone proved either partially effective or inconsistent under variable environmental conditions. It, therefore, becomes imperative to prefer an integrated approach combining various methods (effective, feasible and low cost) for eradication of broomrape menace in tobacco with an aim to reducing seed bank in soil, infection to host and reproduction. Future research on the critical elements of long-term integrated strategy for *Orobancha* should focus on: (a) Reducing seed bank in soil while avoiding fresh additions (suicidal germination by use of germination stimulants and false hosts), (b) Identification of resistance sources in wild and related species and their introgression into cultivated tobacco (c) Identification and timely application of parasite life-cycle phase specific cultural practices and (d) Community approach to implement integrated strategies for effective control of broomrape.

  
(D. DAMODAR REDDY)

### FLAGSHIP PROGRAMMES OF GOVERNMENT OF INDIA

#### LED based lighting and energy efficient equipment

In order to reduce the energy requirement, LED based lighting and energy efficient equipment has been installed at ICAR-CTRI, Rajahmundry. This initiative has resulted in considerable reduction in electricity consumption at the Institute.

#### Roof top solar PV system

Grid connected roof top Solar PV system having the capacity of 149.5 KWP was installed at ICAR-CTRI, Rajahmundry. Test run of the system completed and is ready for commencing. Around 70% of the energy requirement of the Institute is estimated to be met from this system.



### PULSES SEED HUB

ICAR-CTRI is one of the seed hub centers for pulses under National Food Security Mission (NFSM). Under this, around 705 quintals of pulses seed (Red gram and Bengal gram) was produced, processed and supplied, against a target of 700 quintals, to APSSDC unit, Tanuku. For seed processing, a Seed Processing Shed and Drying Yard were constructed and Seed Processing Machinery installed. Further, construction of office unit of seed hub is in progress.



### VISITORS

**Dr. E.B. Chakurkar**, Director, ICAR-CCARI, Goa along with the team of scientists visited ICAR-CTRI, Rajahmundry on 27.01.2018.

**Shri A. Sridharbabu**, Secretary, Tobacco Board, Guntur visited ICAR-CTRI RS, Jeelugumilli on 01.02.2018.

### RESEARCH HIGHLIGHTS

#### Tobacco Cultivar Improvement

- ❑ FCV tobacco: Two entries viz., FCJ-11 and FCJ-15 found superior with higher leaf yield (18% and 16%, respectively) and grade index than check varieties Kanchan and LT- Kanchan in bulk trial at CTRI RS, Jeelugumilli.
- ❑ In a hybrid trial, the fertile hybrid SH-1 and CMS SH-1 hybrids recorded an improvement of 6 % in cured leaf compared to Siri at CTRI RS, Jeelugumilli.
- ❑ Burley Tobacco: Two burley entries viz., YB-19 and YB-22 found promising in bulk trial.
- ❑ Chewing tobacco: The selections HV.2011- 2 and HV.2009-3 were found superior to check Abirami in bulk trial at CTRI RS, Vedasandur.

#### Agro-technologies

- ❑ Application of FYM (10 t/ha) along with balanced NPK or Excess N + PK proved effective in overcoming the false maturity problem in tobacco grown in Alfisols under irrigated conditions.
- ❑ Adoption of dense planting technique (22,222 or 24,691 plants/ha versus 18,181 plants/ha) resulted in increased productivity (13-15%) of FCV tobacco in KLS region.
- ❑ Adoption of technology module consisting of *in-situ* green-manuring, balanced NPK fertilization, management of *Orobanche* and pest management significantly improved the farmer's income in NLS and SLS areas.
- ❑ Gender specific adaptation programmes, strategies and technological interventions were identified in specific areas including fish processing, preservation, value addition techniques, diversified livelihood programmes and marketing for fisher women to mitigate climate change.

#### Tobacco for alternative uses

- ❑ Developed and standardized tobacco seed oil refining technique in collaboration with IICT, Hyderabad. Acute pre-clinical toxicity evaluation of tobacco seed oil in collaboration with NIN,

Hyderabad revealed no significant adverse effect on rats.

#### Management of resource constraints for production efficiency and produce quality

- ❑ Tobacco Stem Biochar (TSB) application resulted in increased C E C of light textured Alfisol in addition to a significant liming effect. The TSB application also caused a marked increase in FCV tobacco yield.
- ❑ Agri-biomass briquette making facility was established to convert the waste agri-biomass to briquettes for its utilization in FCV tobacco curing for reduced dependency on fuel-wood.
- ❑ Foliar application of Gibberellic acid @ 50 ppm during grand growth period of FCV tobacco enhanced the productivity of flue-cured tobacco under moisture stress conditions in Southern Light Soils.

#### Integrated Management for Biotic stresses

- ❑ Spinosad 45 SC @ 0.018 %, chlorantraniliprole 18.5 SC @ 0.005 % and flubendiamide 48 SC @ 0.012 % were found to be highly effective against *Helicoverpa armigera*. Novaluron + emamectin benzoate 6.15 SC @ 0.012% was found promising against *Spodoptera litura* in tobacco nurseries.
- ❑ Studies on compatibility of insecticides and fungicides showed that chlorfenapyr 10 SC @ 0.01 % and chlorantraniliprole 18.5 SC @ 0.005 % in combination with all the tested fungicides and the combinations of copper oxy chloride 50 WP @ 0.2 % and azoxystrobin 23 SC @ 0.1 % with emamectin benzoate 5 SG @ 0.0025 % were found to be compatible on tobacco.
- ❑ Fenamidone+ mancozeb 60 WG @ 0.3% is a promising alternative to metalaxyl 8% + mancozeb 64% for the management of black shank disease in FCV tobacco field crop.
- ❑ Soil application of *Trichoderma viride* ( $2 \times 10^7$  CFU/ g) with neem cake @ 30 g/m<sup>2</sup> was found effective in suppressing soil borne fungal diseases caused by *Pythium aphanidermatum* and *Phytophthora parasitica* f.sp. *nicotianae* in FCV tobacco nurseries.



## CELEBRATIONS

### Web Telecast of Honorable Prime Minister's Address and Interaction

Web telecasting of Prime Minister Address on the occasion of laying foundation stone for 25 KVKs, during the Krishi Unnati Mela 2018 was arranged at ICAR-CTRI, Rajahmundry on 17.3.2018. A total of 550 members comprising scientists, faculty members, farmers, veterinary officials of state department, students and women self-help groups attended the programme.

Again on 20.06.2018, live broadcasting of Hon'ble Prime Ministers' interaction with the farmers through Video-Conferencing was arranged at ICAR-CTRI, Rajahmundry and its Research Stations. Around 150 persons including staff and farmers attended and viewed the programme.

### Swachh Bharat Abhiyan

As a part of Swachh Bharat Campaign, a vacant area available at ICAR-CTRI was cleaned and used for developing a papaya orchard block. It was named as Swachh Bharat Orchard Block. The activities like weeding, basin making, fertilizer application and irrigation are regularly taken up in the block.

### International Women's Day

ICAR-CTRI celebrated "International Women's Day" on 8<sup>th</sup> March, 2018 with the theme "# Press for progress". All the staff members participated in the programme. Women staff of ICAR-CTRI actively participated in different competitions held on this occasion.



### International Yoga Day

International Yoga Day was celebrated on 21.6.2018 at ICAR-CTRI, Rajahmundry and its Research Stations. In this occasion, the chief guests, Mrs. Kalpana Murthy and Mr. Murthy, Senior Yoga teachers from Bodhi Satva Pyramid House, Rajahmundry have delivered a talk on importance of yoga in daily life at ICAR-CTRI, Rajahmundry.

## MEETINGS

### Research Advisory Committee Meeting

Research Advisory Committee Meeting (RAC) was held on 7-8 June, 2018 at ICAR-CTRI, Rajahmundry with the newly constituted committee.



The meeting was attended by Chairman, Dr. H. Shivanna, Former Vice-chancellor, UAS, GKVK, Bangalore and all distinguished members; Dr. R. K. Singh, ADG (CC), ICAR, Dr. K. S. Varaprasad, Former Director, IIOR, Hyderabad, Dr. D. Damodar Reddy, Director, ICAR-CTRI, Rajahmundry, Dr. V.R. Rao, Former Pr. Scientist & Head, Crop Production Division, CRRI, Cuttack, Dr M. Krishna Reddy, Pri. Sci. and i/c Head, Division of Plant Pathology, IIHR, Bengaluru, Dr. S.K. Patanayak, Prof. & Head, Department of Soil Science & Agricultural Chemistry, OUAT, Bhubaneswar, Sri Nagapuri Rajamouli, Farmer, Member- IMC. The committee critically reviewed the research progress of the institute and made advisories for improving research programmes.

### Institute Management Committee Meeting

The 52<sup>nd</sup> Meeting of Institute Management Committee was held

on 22.05.2018 at ICAR-CTRI, Rajahmundry and discussed about various management issues related to the institute.

### IJSC Meeting

The 5<sup>th</sup> Meeting of the XIII<sup>th</sup> ICAR-CTRI Institute Joint Staff Council meeting was held on 22.05.2018 at ICAR-CTRI, Rajahmundry. The IJSC examined various issues related to staff welfare including provision of pure drinking water, identifying the panel for homeo/ayurvedic consultants etc.

## TRANSFER OF TECHNOLOGY

### Field Friends programmes

Field Friends Teams consisting of nominated Scientists and Technical Officers of ICAR-CTRI, Rajahmundry and Regional Stations, Guntur & Kandukur along with Tobacco Board officers and executives from the trade visited the tobacco nurseries and main fields and advised on Good Agricultural Practices during the months of December-2017 and January- 2018. Tobacco Board, Guntur organized a total of 12 Field Friends programmes in the tobacco auction platforms of NLS, SLS and SBS areas of Andhra Pradesh.



### Training programme

A training programme was organised on "Analytical Techniques for Leaf Quality, Pesticide Residues and Smoke Constituents" during 3-6 April, 2018 at ICAR-CTRI, Rajahmundry. Scientific/technical staff of National Tobacco Testing Laboratory, Mumbai were trained in the programme.

## Workshop

Tobacco Board, Guntur has conducted one day workshop on "Good Agricultural Practices" on 18.1.2018 at ICAR-CTRI RS, Kandukur. Around 100 persons including Scientists, progressive farmers and Tobacco Board field staff participated in the programme.

## Field IRC & Workshop on Good Agricultural Practices (GAP)

The Director and Scientists of ICAR-CTRI, Rajahmundry attended the Field IRC on 1.2.2018 at ICAR-CTRI RS, Jeelugumilli. The team visited various field experiments and reviewed the progress. Later, the team participated in the workshop on GAP for FCV tobacco production in NLS organised by the Tobacco Board in collaboration with ICAR-CTRI at the station.

## Krishi Unnati Mela

ICAR-CTRI participated in Krishi Unnati Mela organized by Ministry of Agriculture and Farmers Welfare, GOI at IARI, New Delhi during 15-18 March, 2018. An exhibition stall displaying various technologies developed by the Institute was put up in the mela, which was visited by large number of farmers and stakeholders.

## AWARDS

Dr. U. Sreedhar, Principal Scientist & Head, Division of Crop Protection has been conferred 'Dr. Anand Prakash Award-2018' by Applied Zoological Research Association, Bhubaneswar and 'Dr. D. Bap Reddy Memorial Award' of the Plant protection Association of India, Hyderabad.



## KRISHI VIGYAN KENDRA (KVK)

Krishi Vigyan Kendra (KVK), Kalavacharla organized 15 training programmes for farmers and rural women in the areas of IPM in horticultural crops, Weed management in floricultural crops, Management of snails in horticultural crops, Fruit-fly management in Guava, Value added products with milk, Sisal Fibre Extraction, Jute cloth products making, Gament making & Saree Printing, Coir pith compost making, Banana fibre extraction, Skill upgradation in garment making and Sea-shells decoratives making.

In association with Coconut Development Board, Cochin and Dr.YSRHU HRS, Ambajipet a training programme on 'Friends of Coconut Tree (FoCT)' was organised during 26 -31 March, 2018 at KVK Kalavacharla. On this occasion, coconut tree climbing machines were distributed to trainees along with a certificate of participation.



A training programme on 'Milky Mushroom Production - Value Addition' was organised in association with ATMA-East Godavari, during 7-13 March, 2018 at KVK, Kalavacharla. Twenty rural youth were trained in this programme.

A training cum awareness programme on 'Transferable technologies in Animal Health Management' was organized for Extension Functionaries on 17.03.2018 at KVK, Kalavacharla. A total of 60 Veterinary Assistant Surgeons, Assistant Directors and Deputy Directors participated in the programme.

Scientific Advisory Committee (SAC) Meeting-2018 was organised at CTRI, Rajahmundry on 19<sup>th</sup> February, 2018 under the chairmanship of Dr. D. Damodar Reddy, Director, ICAR-CTRI, Rajahmundry. KVK officials, HODs of CTRI and officials from line department participated. The SAC reviewed the work done during 2017-18 and finalised the action plan for 2018-19.

CTRI-KVK organised farmers meet in KVK, Kalavacharla on 20.06.2018 and arranged the live telecast of the interaction of Hon'ble Prime Minister with farmers through electronic media. Fifty farm women and farmers participated in the programme.

## PERSONALIA

### Appointments

Following personnel have been appointed as Technical Assistant (T-3) during the period.

S.N.	Name	Date
1.	Ms. P. Srilakshmi	01.06.18
2.	Sri S. Simhachalam	01.06.18
3.	Sri K. Sravana Kumar	01.06.18
4.	Sri K. Vidya Sagar	01.06.18
5.	Sri S. Bhaskar Naik	01.06.18
6.	Sri V. Kamal Kumar	01.06.18
7.	Ms. K. Sridevi	01.06.18
8.	Sri K. Veeranna	06.06.18
9.	Sri M. Naresh Kumar	08.06.18
10.	Sri M.V.M. Shareef	22.06.18

### Retirements

Following ten employees of the Institute retired from the Council's service on supeannuation during the period.

S.No.	Name	Date
1.	Sri Y.S. Sarma	31.01.18
2.	Sri V.N. Murthy	01.02.18
3.	Sri G.Vasudevamurthy	28.02.18
4.	Sri B. Nageswararao	28.02.18
5.	Sri S. Ramesh	31.03.18
6.	Sri S. Sambasivarao	30.04.18
7.	Sri V.Venkata Ramana	31.05.18
8.	Sri K. Bhyravaswamy	31.05.18
9.	Sri U.R.K. Murthy	30.06.18
10.	Sri K. Subbulu	30.06.18

### Obituary

❑ Sri K. Mallikarjuna passed away on 16.01.2018.