



DOR Newsletter



Vol. 19

No. 4

December 2013

RESEARCH NEWS

Promising sunflower hybrids for seed yield and oil content developed at DOR, Hyderabad

A set of elite germplasm and inbred lines were crossed with four diverse CMS lines *viz.*, *Helianthus petiolaris* (CMS-207, CMS-852, CMS-7-1A & CMS-234A/M-1017), *H. fallax* (FMS-852A & FMS/M-1008), *H. lenticularis* (IMS-852A) and *H. giganteus* (GIG1/RHA-298). The hybrids were evaluated for seed yield/plant and oil content along with DRSH-1 and KBSH-44 as checks during *kharif*2013 at Narkhoda farm. The promising cross combinations based

Table 1. Promising cross combinations identified for seed yield and oil content in sunflower

| Cross | Seed yield/ plant (g) | Oil content (%) | | |
|--------------------------------|--------------------------|--------------------|-------------|-------------|
| | | DOR | Bengaluru | Mean |
| CMS-207A x GMU-81 | 12.7 | 42.8 (41.6) | 39.9 | 41.4 |
| CMS-852A x GMU-122 | 10.6 | 48.2 (47.9) | 46.3 | 47.3 |
| FMS-852A x GMU-156 | 12.1 | 55.3 (53.4) | 52.0 | 53.7 |
| CMS-852A x GMU-156 | 25.0 | 44.6 (44.8) | 41.8 | 43.2 |
| IMS-852A x GMU-157 | 39.0 | 44.7 (45.2) | 40.7 | 42.7 |
| CMS-852A x GMU-171 | 43.5 | 44.7 (43.6) | 42.2 | 43.5 |
| FMS/M-1008 x Selection-I | 18.5 | 50.7 (51.4) | 48.9 | 49.8 |
| CMS-7-1A x AKSFI-78 | 35.1 | 42.2 (41.8) | 38.6 | 40.4 |
| CMS-234A/M-1017 x IB-50 | 37.0 | 52.0 (50.3) | 49.9 | 51.0 |
| GIG1/RHA-298 x Selection-I | 25.6 | 43.4 (42.1) | 41.7 | 42.6 |
| DRSH-1 (Check) | 32.6 | 42.6 (43.9) | 40.2 | 41.4 |
| KBSH-44 (Check) | 43.5 | 39.7 (38.4) | 39.1 | 39.4 |

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* The oil content (%) of the seeds was analyzed in NMR at two laboratories: DOR and AICRP-Bengaluru. The values in parenthesis indicate the oil content as estimated by Soxhlet method at DOR.

on seed yield/plant and oil content in comparison with checks are listed in Table 1. None of the cross combinations had higher seed yield/plant over the checks. However, four cross combinations *viz.*, CMS-852A x GMU-122, FMS-852A x GMU-156, FMS/M-1008 x Selection-I and CMS-234A/M-1017 x IB-50 had higher oil content, which ranged from 47.3% to 53.7%. Among them, CMS-234A/M-1017 x IB-50 was the most promising combination since it recorded higher seed yield/plant (37 g) than DRSH-1 (32.6 g) and higher oil content (51%) than both DRSH-1 (41.4%) and KBSH-44 (39.4%).

H.P. Meena, Praduman Yadav and K.S. Varaprasad

Trainings

Training programme on “Production technologies of sesame for increasing productivity in Tripura State”

A training programme on “Production technologies of sesame for increasing productivity in Tripura State” was organized at Agarthala during November 25-26, 2013. Forty six officials from the Tripura State Agriculture Department participated in the training programme. Dr. M. Padmaiah, Principal Scientist, DOR was the Nodal Scientist and Dr. A.R.G. Ranganatha, Project Coordinator (Sesame & Niger), Jabalpur; Dr. V. Muralidharan, Ex-Director (Retd.), DGR, Junagadh; Dr. A.J. Prabakaran and Dr. S.V. Ramana Rao, Principal Scientists, DOR were the resource persons.

“Awareness-cum-training programme of PPV&FRA”

An awareness-cum-training programme on “Protection of Plant Varieties and Farmers Rights” was organized at Sri Aurobindo KVK, Gaddipalli village, Nalgonda district on 19 December, 2013. The programme was aimed at spreading information on the provisions of PPV & FRA, 2001 with emphasis on Farmers' and Community Rights. About 100 participants including KVK personnel from Zone-V from both Govt. and NGO sectors as well as innovative / progressive farmers from Nalgonda and Krishna districts of Andhra Pradesh participated in the training programme.

Shri G. Gopal Reddy, Secretary, Sri Aurobindo KVK was the Guest of Honour for the inaugural session. Dr. Dattatri, Principal Scientist, ZPD-V was the Chief Guest accompanied Dr. Chary Appaji, Principal Scientist, ZPD-V. The awareness programme included interactive lectures delivered by Dr. C. Lavanya, Principal Scientist, DOR on Farmers Rights; Dr. G.D. Satish Kumar, Senior Scientist, DOR on National Gene Fund and Community Awards and Dr. B. Sarath Babu, Principal Scientist, NBPGR Regional Station, Hyderabad on “Procedures for Application for Community Rights” with a case study on award to Sanjeevani Rural Development Society, Vishakapatnam,



Andhra Pradesh. Procedures for registration of farmers varieties were described by Dr. N. Mukta, Principal Scientist and Mr. A. Praveen Reddy, SRF, DOR. Posters on Farmers Rights, National Gene Fund including details of Plant Genome Saviour Award, filing of application for registration of farmer's varieties etc., in telugu were displayed at the training venue.

Field Days

“Safflower Germplasm-cum-Breeders Day” conducted at AICRP (Safflower) centre, Solapur

A “Safflower Germplasm-cum-Breeders Day” was conducted at AICRP (Safflower) centre, Solapur on 27 December, 2013. Safflower breeders from AICRP centres at Phaltan, Parbhani, Akola, Tandur, Annigeri,



Raipur as well as the PI and Co-PI (Germplasm) of AICRP (Safflower) from DOR attended the programme.

Breeders observed the variability among 270 germplasm accessions sown at the centre as well as the screening trials conducted for identification of promising accessions against safflower aphid and *Fusarium* wilt. Dr. S.K. Shinde, Breeder at Solapur centre and his associates explained the various activities of the centre. The breeders visited the trials of breeding material in advanced generations, PYT and other station trials. This was followed by discussion and interaction with Dr. J.R. Kadam, Associate Director of Research, ZARS, Solapur.

Meetings

Institute Management Committee Meeting

The 32nd meeting of the Institute Management Committee (IMC) was held on 2 December, 2013 at DOR under the Chairmanship of Dr. K.S. Varaprasad, Project Director, DOR. The meeting was attended by IMC members *viz.*, Dr. Y. Laxman Das, JDA (CS), Govt. of AP, Hyderabad; Dr. R. Ranga Reddy, Director of Research, ANGRAU; Dr. T. Radhakrishnan, Principal Scientist, DGR, Junagadh; Dr. S.N. Sudhakara Babu,



Principal Scientist, DOR; Shri P. Gopal Reddy and Shri Vishnupant Narayanarao Mahle, Members (Non-Official); Shri K. Srinivasa Rao, FAO, DRR and Shri Anil Behari, SAO, DOR and Member Secretary. Dr. I.Y.L.N. Murthy, Principal Scientist; Dr. D. Pati, Tech. Information Officer and Shri H. Ganesh, FAO, DOR also participated in the meeting as special invitees. The Chairman welcomed the members and presented the research achievements of the Directorate. The committee reviewed different research and developmental activities

and applauded the overall progress made by the Institute. Thereafter the Member Secretary apprised the members about the Action Taken Report on the proceedings of the 31st IMC meeting.

Lectures

Lecture on “Crop response and adaptation to environmental conditions”

Dr. P.V. Varaprasad, Professor, Crop Eco-Physiology, Department of Agronomy, Kansas State University delivered a talk on “Crop response and adaptation to environmental conditions” at DOR on 19 December, 2013. His talk encompassed an overview of impact of climate change and variability and the ongoing research activities at their institute with reference to increasing CO₂, temperature and their interaction on crop plants. He stated that elevated CO₂ increases crop photosynthesis, increased temperature reduced pollen viability, seed set and seed yield. Various techniques and tools required for such type of studies were also discussed in the presentation.

Lecture on “Potential for drug discovery and delivery from plants: special reference to safflower”

Dr. K. Ruckmani, Professor & Head, Department of Pharmaceutical Technology, Anna University, BIT Campus, Tiruchirappalli delivered a lecture on “Potentials for drug discovery from plants and delivery systems: special reference to safflower” at DOR on 23 December, 2013. She highlighted the process of drug discovery, development and delivery systems. She emphasized that isolation and purification of major active constituents (Carthamidin, Quercetin and Vitamin C) present in safflower can be utilized in treatment of various diseases like COPD and cystic fibrosis, etc. The flavonoids as phyto-constituents can be used in the mode of Phytosomal Drug Delivery System. Carthamidin, the nutrient rich flavonoid, present in safflower petals, could be further studied and the gene responsible for its expression can be isolated and over-expressed for its nutritional value and checked for various value added products.

Inauguration of Polyhouse at DOR Rajendranagar farm

A new polyhouse facility with temperature and humidity control was established and inaugurated by Dr. K.S. Varaprasad, Project Director on 3 December, 2013 at DOR Rajendranagar research farm. The facility is aimed at enabling year round screening and selection of castor germplasm against gray rot. Artificial epiphytotics of the gray rot could be created in short time in the



polyhouse and can be highly dependable in identifying stable resistance sources to *Botryotinia* gray rot in castor. The screening facility now replaces the screening methods like open field fogging and glass house cut-spike methods adopted earlier. The polyhouse can also be

HRD

Participation in Training Programmes/Workshops/Seminars/Conferences

| Name | Programme | Venue | Date |
|---|---|---|---------------------------------|
| Dr. H.P. Meena | Orientation-cum-training programme on "Breeding Strategies and Methodologies for Sunflower Improvement under AICRP" | GKVK, UAS, Bengaluru | 9-10 October, 2013 |
| Dr. M. Sujatha | Joint Symposium of " <i>Jatropha</i> updates 2013 (JSB-2013)" | Kasetsart University, Bangkok, Thailand | 16-19 October, 2013 |
| Dr. Md. A. Aziz Qureshi | National convention on "Development in Soil Science – 2013" | CAZRI, Jodhpur | 23-26 October, 2013 |
| Dr. S.V. Ramana Rao Mr. G. Raghunath Mr. V. Sambasiva Rao | National workshop on "KOHA Library Management Software" | ANGRAU-DOR, Hyderabad | 25-26 October, 2013 |
| Dr. M. Padmaiah | Stakeholder meeting on "NGO Access Development Service" | LEEJA, Mahabubnagar | 15 November, 2013 |
| Dr. Praduman Yadav | Training on "Advanced 'Omics' Techniques for Improvement in Plant and Human Health" | IARI, New Delhi | 15 November to 5 December, 2013 |
| Dr. M. Sujatha | Training programme on "Next Generation Sequencing (NGS)" | CCMB, Hyderabad | 18-27 November, 2013 |
| Dr. K.S. Varaprasad Dr. P. Giribabu | National symposium on "Nematode: A Friend and Foe of Agri-Horticultural Crops" | NSI, Solan | 21-23 November, 2013 |
| Dr. P. Duraimurugan | "4 th Biopesticides International Conference (BIOCICON-2013)" | St. Xavier's College, Palayamkottai, TN | 28-30 November, 2013 |
| Dr. Mangesh Yuwaraj Dudhe | National symposium on "Current Trends in Biotechnology" | Osmania University, Hyderabad | 7-8 December, 2013 |

used for screening and identifying resistant sources of castor, safflower and sunflower against pest and pathogens under controlled condition.

External funded project under private-public partnership mode

A project entitled "Development of high oleic safflower genotypes for Indian conditions and development of protocols for marker-assisted selection for high oleic trait in safflower" has been approved by ICAR for funding by MARICO Ltd., Mumbai *w.e.f.* 11 November, 2013.

Germplasm registration

Germplasm Ole-9-P2-P1-P22 of safflower (INGR-13066) developed by Dr. K. Anjani, Dr. I.Y.L.N. Murthy and Dr. Praduman Yadav was registered by Plant Germplasm Registration Committee (PGRC) of Indian Council of Agricultural Research on 31 July, 2013.

PPV&FRA Registered DOR sunflower cultivars

Sunflower hybrid DRSF-1 and varieties DRSF-113 and DRSF-108 were registered under extant category by the Protection of Plant Varieties and Farmers Rights Authority (PPV&FRA), New Delhi and certificates were received to that extent.

Publications

Research Papers

- Satishkumar, G.D., Padmaiah, M., Aivelu, K. and Madhuri, P. 2013. Impact of mobile phone based agro-advisories on knowledge of sunflower (*Helianthus annuus* L.) farmers. *Journal of Oilseeds Research*, **30** (2): 154-157. DOR/SS-28/13.
- Thuirei Jacob Ningshen, Chaitanya, R.K., Prashanth P. Hari, Vimala Devi, P.S. and Aparna Dutta-Gupta, 2013. Characterization and regulation of *Bacillus thuringiensis* Cry toxin binding aminopeptidases-N (APNs) from non-gut visceral tissues, Malpighian tubule and salivary gland: Comparison with midgut-specific APN in the moth *Achaea janata*. *Comparative Biochemistry and Physiology, Part B*, **166**: 194-202. DOR/CP-39/14.
- Vimala Devi, P.S. and Duraimurugan, P. 2013. Exploitation of *Nomuraea rileyi* and *Beauveria bassiana* for the management of lepidopteran pests. *Kavaka*, **41**: 43-67. DOR/CP-35/14.

Popular Articles

- ◆ Kadirvel, P., Mukta, N., Praduman Yadav and Varaprasad, K.S. 2013. Safflower varieties of Mexico show promise for enhancing oil content under Indian conditions. *DOR Newsletter*, **19** (2): 5-6. DOR/CI-70/13.
- ◆ Praduman Yadav, Meena, H.P., Murthy, I.Y.L.N. and Padmaiah, M. 2013. *Rabi* me tilhan utpadan. *Khad Patrika*, **54** (9): 22-26. DOR/NRM-63/13.

Papers Presented in Seminars/ Workshops/ Conferences

- ★ Lakshminarayana, M., Duraimurugan, P. and Vimala Devi, P.S. 2013. Efficacy of microbial and botanical formulations for the management of lepidopteran pests infesting castor. "Fourth Biopesticide International Conference" held at Crop Protection Research Centre, St. Xavier's College, Palayamkottai, Tamil Nadu from 28-30 November, 2013. DOR/CP-28/13.

Booklet

- Padmaiah, M., Lavanya, C., Laxminarayana, M., Suresh, G. and Prabhakaran, A.J. 2013. Amudamlo Vithanothpathi: Yajamanyamu Mariyu Vithanothpathilo Rythula anubhavalu. DOR, Hyderabad.

Folder

- ✦ Padmaiah, M., Satish Kumar, G.D. and Ramana Rao, S.V. 2013. Castor Cultivation: A Boon to Chenchu Farmers. (A Chenchu Farmers' Success Story). DOR, Hyderabad.

Invited Lectures

- ◎ Dr. Mangesh Y. Dudhe, Scientist (Plant Breeding) delivered a lecture on "In silico development of microsatellite markers by using microsatellite identification tools available in public domain" during the National Symposium on "Current Trends in Biotechnology" organized by Department of Botany, Osmania University, Hyderabad, 7-8 December, 2013.
- ◎ Dr. Sentilvel Senapathy, Sr. Scientist (Pl. Breeding) delivered a lecture on "Association mapping" during the International Training Programme under "Technical Assisted Programme Africa" conducted by CICR, Nagpur on 17 December, 2013.

Visitors

A total number of 325 visitors consisting of farmers, trainee participants, delegates and students from various states, other institutes and different agricultural universities visited this Directorate.

DOR participated in DRR Farmers Day

DOR participated and exhibited its technologies during farmers day celebrations held at DRR Research farm on 20 October, 2013. About 400 farmers visited the DOR stall.

निदेशालय राजभाषा पुरस्कार से सम्मानित

नगर राजभाषा कार्यान्वयन समिति (केन्द्र सरकार), हैदराबाद की 49वीं बैठक क्रीडा के निदेशक तथा समिति के अध्यक्ष डॉ. वी. वेंकटेश्वरु



की अध्यक्षता में केन्द्रीय युनानी चिकित्सा अनुसंधान संस्थान में 23 अक्टूबर, 2013 को आयोजित की गई। बैठक में केन्द्र सरकार के कार्यालयों के 175 से भी अधिक प्रतिनिधियों ने भाग लिया।

तिलहन अनुसंधान निदेशालय को हैदराबाद स्थित केन्द्रीय सरकारी कार्यालयों में संघ की राजभाषा नीति के कार्यान्वयन में सर्वोत्तम निष्पादन के उपलक्ष्य में वैज्ञानिक अनुसंधान एवं विकास संगठनों की श्रेणी में तृतीय पुरस्कार स्वरूप शील्ड प्रदान की गई। इसे निदेशालय के प्रभारी निदेशक डॉ. आईवाईएलएन मूर्ति एवं सहा. निदेशक (रा.भा.) श्री प्रदीप सिंह ने प्राप्त किया।

नराकास की ओर से शब्द स्मृति ज्ञान प्रतियोगिता का आयोजन

निदेशालय में 18 दिसंबर, 2013 को नगर राजभाषा कार्यान्वयन समिति (केन्द्र सरकार) की ओर से केन्द्र सरकार के कर्मचारियों हेतु शब्द



स्मृति ज्ञान प्रतियोगिता का आयोजन किया गया। प्रतियोगिता डॉ.आईवाईएलएन मूर्ति, प्रभारी निदेशक के नेतृत्व में आयोजित की गई।

प्रतियोगिता का शुभारंभ संतराम यादव, सहायक निदेशक (रा.भा.) तथा सदस्य सचिव, नराकास के स्वागत भाषण से हुआ। डॉ. मूर्ति ने अपने भाषण में इस तरह की प्रतियोगिताओं के आयोजन पर प्रकाश डालते हुए कर्मचारियों से अधिक संख्या में भाग लेने का आग्रह किया। इस प्रतियोगिता में केन्द्रीय सरकारी कार्यालयों के अधिकारी/कर्मचारियों ने उत्साह से भाग लिया। प्रदीप सिंह, सहायक निदेशक (रा.भा.) ने इस प्रतियोगिता के आयोजन का अवसर प्रदान करने हेतु सचिव नराकास तथा हैदराबाद स्थित विभिन्न कार्यालयों से आए प्रतिभागियों को धन्यवाद दिया।

राजभाषा कार्यशाला का आयोजन

निदेशालय में एक दिवसीय कार्यशाला का आयोजन 21 दिसंबर, 2013 को किया गया। कार्यशाला की अध्यक्षता डॉ. आईवाईएलएन मूर्ति,



प्रभारी परियोजना निदेशक ने की। कार्यक्रम का शुभारंभ श्री प्रदीप सिंह, सहायक निदेशक (रा.भा.) के स्वागत भाषण से हुआ।

इस कार्यशाला में श्री कमालुद्दीन, सहा. निदेशक, हिन्दी शिक्षण योजना, हैदराबाद ने पारिभाषिक शब्दावली का निर्माण कैसे हुआ, कैसे अन्य भाषाओं के शब्दों से इसका निर्माण हुआ। संस्कृत, तेलुगु, उर्दू तथा अंग्रेजी के शब्दों को अपनाया गया। आपने बहुत सरल तरीके से हिन्दी भाषा का व्याकरण, इसके उपयोग में आने वाली कठिनाइयाँ तथा इसे दूर करने के उपाय बताए। सरकार की राजभाषा नीति और इससे संबंधित नियमों की जानकारी दी। कार्यालय में हिन्दी का उपयोग बढ़ाने संबंधी बहुत सारी महत्वपूर्ण जानकारी प्रदान की।

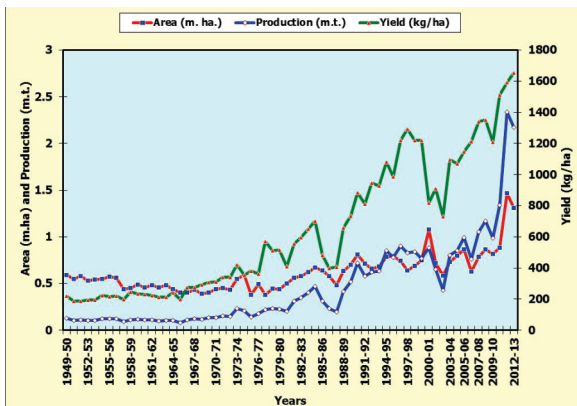
डॉ. आईवाईएलएन मूर्ति, प्रभारी परियोजना निदेशक ने अपने अध्यक्षीय भाषण में कहा की यह जानकारी बहुत उपयोगी एवं कार्यालय में हिन्दी के उपयोग को बढ़ाने में एक महत्वपूर्ण कदम है। अनिल बिहारी के धन्यवाद ज्ञापन से कार्यक्रम का समापन हुआ। इस कार्यशाला में निदेशालय के वैज्ञानिक, अधिकारी एवं स्टाफ सदस्यों ने भाग लिया।

From Director's Desk

The current castor (*Ricinus communis* L.) production in the country is 2.17 million tonnes harvested from 1.32 million hectares with a productivity of 1653 kg/ha (2012-13). Despite phenomenal increase witnessed in the production and productivity over two decades, there are wide regional disparities in the productivity of castor. In irrigated tracts of Gujarat and Rajasthan, the productivity has registered a four-fold increase since 1970, whereas the general productivity level of rainfed castor in traditional tracts is a cause of concern. In order to retain India's leadership position in the global market, it is necessary to adopt latest technological inputs for improving crop productivity with greater emphasis on quality and value addition.



Castor productivity is the highest in Gujarat (2060 kg/ha) and extremely low in Andhra Pradesh (493 kg/ha) among the major castor growing states. The All India Coordinated Research Project on Castor (AICRP Castor)



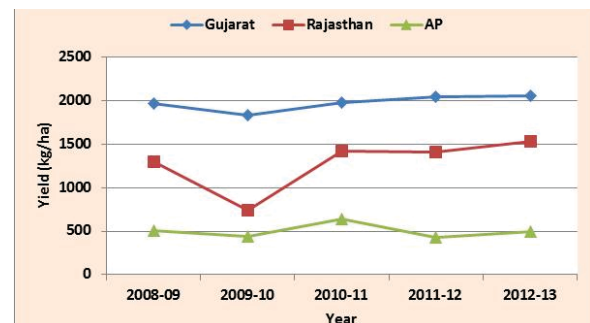
has made remarkable progress to make the otherwise neglected but important industrial oilseed crop castor – a vibrant commodity in the crop profile of the country both under rainfed and irrigated conditions. The project has facilitated the development and release of high yielding disease resistant hybrids (13) and varieties (18) which occupy more than 95% of total castor acreage in the country. GCH-7, DCH-177 and DCH-519 are the most promising hybrids covering large area. The widespread adoption of these elite cultivars in conjunction with appropriate and tailor made production and protection packages generated under the project has

heralded the phenomenal four-fold increase in productivity and seven-fold increase in production of the crop and the trend is remarkably being maintained.

During last five years, the area and production in Gujarat has doubled. In case of Rajasthan, the production has doubled along with 20% increase in productivity, whereas, the productivity is at par with slight improvement in area and production in Andhra Pradesh. As is evident from frontline demonstrations in the castor growing states, there exists large yield gap, which needs to be bridged through concerted efforts of all the stakeholders.

The following initiatives are in the pipeline in order to enhance productivity of castor in the country in general and Andhra Pradesh in particular:

- With a view to manage the *Botrytis* disease in castor which is very serious in Andhra Pradesh, this Directorate has taken a major initiative during 12th plan period to address the problem and initiated a flagship project entitled “Multipronged/multidisciplinary approach to ameliorate yield losses caused by gray rot in castor”. The work has been assigned to a specially identified multidisciplinary Task Force to understand the host-plant-environment interactions and plant



defense mechanisms and develop integrated crop management system for gray rot management in castor.

- Extending castor cultivation to newer niches such as in six districts of Haryana bordering Rajasthan, parts of Madhya Pradesh; rainfed parts of Odisha and Tamil Nadu to enhance production.
- Intensifying castor hybrid breeding suitable for late *kharif* and *rabi* with target productivity of over 4000 kg/ha.
- Promoting research on *rabi* castor cultivation in Andhra Pradesh, Karnataka and Tamil Nadu with protective irrigation to make castor a viable cash crop.

Digitization of DOR Publications under e-Granth Project



Release of digitized CDs

Digitization of DOR institutional repositories was undertaken during 2013 under the NAIP Sub-project "Strengthening of Digital Library and Information Management" under NARS (e-Granth). Around thirty five thousand pages of important DOR publications including, historical records, annual progress reports of mandated crops, success stories, special bulletins, project reports, proceedings of various group meetings etc., were collected, collated and digitized for the benefit of oilseeds research workers in NARS. The digitization work was carried out at ANGRAU Central Library, Rajendranagar, Hyderabad. CDs in searchable format were distributed to the researchers during the AICRP Annual Group Meetings on Oilseeds and DOR Foundation Day.

List of Digitized CDs

1. DOR Annual Reports (1993-94 to 2012-13)
2. Frontline Demonstrations in Oilseeds: Annual Reports (1990-91 to 2011-12)
3. Performance of FLD's in Oilseeds during plan periods
4. Annual Progress Reports: AICRP on Castor (1985 to 2012-13)
5. Annual Progress Reports: AICRP on Safflower (1982-83 to 2011-12)
6. Annual Progress Reports: AICRP on Sunflower (1980-81 to 2012-13)
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9. Important addresses delivered by Padma Shri Dr. M V Rao on Agriculture
10. Important addresses delivered by Padma Shri Dr. M V Rao on Wheat & Oilseeds
11. DOR Foundation Day Lectures (2000 to 2013)

Printed Matter / Book-Post

Edited by

Dr. P.S. Vimala Devi, Dr. P. Kadirvel, Dr. Md. A. Aziz Qureshi

Compiled by

Mr. V. Sambasiva Rao, Mr. G. Chandraiah

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Published by :

Dr. K.S. Varaprasad

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