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EXTRAORDINARY

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PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित

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NEW DELHI, TUESDAY, JANUARY 16, 2018/PAUSHA 26, 1939

कृषि और किसान कल्याण मंत्रालय

(कृषि, सहकारिता और किसान कल्याण विभाग)

अधिसूचना

नई दिल्ली, 16 जनवरी, 2018

का.आ. 261(अ).—केंद्रीय सरकार, बीज अधिनियम, 1966 (1966 का 54) की धारा 5 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, केंद्रीय बीज समिति से परामर्श करने के पश्चात्, यह राय होने पर कि नीचे की सारणी के स्तंभ (3) में विनिर्दिष्ट किस्मों के बीजों की क्वालिटी को, जो उक्त सारणी के स्तंभ (2) में की तत्स्थानी प्रविष्टियों में विनिर्दिष्ट प्रकार के हैं, विनियमन करना आवश्यक और समीचीन है, यह घोषणा करती है कि बीजों की उक्त किस्में उक्त सारणी के स्तंभ (4) में उल्लिखित राज्यों के लिए कृषि के प्रयोजनों के लिए विक्रय किए जाने के लिए अधिसूचित किस्में होंगी और इस अधिसूचना के राजपत्र में प्रकाशन की तारीख से उक्त अधिनियम के प्रयोजनों के लिए संपूर्ण भारत के लिए अधिसूचित किस्में होंगी, अर्थात्:—

तालिका

क्र.सं.	फसल	किस्म	अनुशंसित क्षेत्र
(1)	(2)	(3)	(4)
1	टमाटर	काशी अमन (वीआरआई -0801)	पंजाब, उत्तर प्रदेश, बिहार और झारखंड।
2	चेरी टमाटर	पुसा चेरी टमाटर -1	ग्रीन हाउस में उत्तर भारतीय मैदान।
3	टमाटर	उन्नत भाग्य	पंजाब, उत्तर प्रदेश, बिहार, झारखंड, मध्य प्रदेश, महाराष्ट्र और गोवा।
4	टमाटर हाइब्रिड	केटीएच-304 (कावेरी टमाटर हाइब्रिड-304)	पंजाब, उत्तर प्रदेश, बिहार और झारखंड।
5	टमाटर	काशी अमूल (वीआरटी-1202)	कर्नाटक, तमिलनाडु और केरल।
6	गार्डन मटर	पालम त्रिलोकी (डीपीपीए-8 ई)	हिमाचल प्रदेश।
7	गार्डन मटर	पालम सुमुल (डीपीपीएम-64)	हिमाचल प्रदेश।

(1)	(2)	(3)	(4)
8	प्याज	भीमा लाइट रेड	कर्नाटक और तमिलनाडु।
9	प्याज	भीमा सफेद	छत्तीसगढ़, गुजरात, कर्नाटक, मध्य प्रदेश, महाराष्ट्र, ओडिशा, राजस्थान और तमिलनाडु।
10	प्याज	गुजरात जूनागढ़ व्हाइट प्याज-3 (जीजेडब्ल्यूओ-3)	गुजरात।
11	प्याज	गुजरात आनंद सफेद प्याज-2 (गावो-2)	गुजरात।
12	लहसुन	भीम ओमकार	दिल्ली, गुजरात, हरियाणा और राजस्थान।
13	लहसुन	भीम पर्पल (एनआरसीआरजी-1)	दिल्ली, उत्तर प्रदेश, हरियाणा, बिहार और पंजाब, महाराष्ट्र, कर्नाटक और आंध्र प्रदेश।
14	लहसुन	गुजरात आनंद लहसुन- 6 (गैग-6)	गुजरात।
15	लहसुन	गुजरात जूनागढ़ लहसुन-5 (जीजेजी -5)	गुजरात।
16	इलायची	अपंगाला-2 (एनएचवाई 35)	कर्नाटक और केरल
17	हल्दी	आईआईएसआर प्रगति	केरल, तमिलनाडु, आंध्र प्रदेश, तेलंगाना, कर्नाटक और छत्तीसगढ़।
18	हल्दी	जीएनटी-2 (एनबीएसटी-64)	गुजरात।
19	सौंफ	अजमेर फेनल-2 (एएफ-2)	भारत के सभी सौंफ उगाने वाले क्षेत्र।
20	काली मिर्च	पन्नियूर 9 (कुल 5308)	केरल, कर्नाटक और आंध्र प्रदेश।
21	अदरक	मोहिनी (यूबीकेवी आडा-1)	केरल, ओडिशा, हिमाचल प्रदेश और पश्चिमी बंगाल।
22	भिंडी हाइब्रिड	गुजरात जूनागढ़ ओकरा हाइब्रिड-4	राजस्थान, गुजरात, हरियाणा और दिल्ली।
23	दिल बीज	गुजरात आनंद सब्जी दिल बीज 1 (जीएवीडी 1)	गुजरात।
24	बैंगन	गुजरात जूनागढ़ बैंगन -3 (जीजेबी -3)	गुजरात।
25	बैंगन	गुजरात आनंद बैंगन हाइब्रिड-3 (जीएबीएच 3)	गुजरात।

[फा. सं. 3-55/2017-एसडी.IV]

डॉ. बी. राजेंद्र, संयुक्त सचिव

MINISTRY OF AGRICULTURE AND FARMERS WELFARE**(Department of Agriculture, Cooperation and Farmers Welfare)****NOTIFICATION**

New Delhi, the 16th January, 2018

S.O. 261(E).—In exercise of the powers conferred by Section 5 of the Seeds Act, 1966 (54 of 1966), the Central Government, after consultation with the Central Seed Committee, is of the opinion that it is necessary and expedient to regulate the quality of the seeds of the varieties specified in column (3) of the Table below of the kinds specified in the corresponding entries in column (2) of the said Table, hereby declares that the said varieties of seeds shall be the notified varieties to be sold for purpose of agriculture for the States mentioned in column (4) of the said Table and shall be the notified varieties for the whole of India for the purposes of the said Act, with effect from the date of publication of this notification in the Official Gazette, namely:—

TABLE

S. No.	Crop	Variety	Recommended Area
(1)	(2)	(3)	(4)
1.	Tomato	Kashi Aman (VRI-0801)	Punjab, Uttar Pradesh, Bihar and Jharkhand.
2.	Cherry Tomato	Pusa Cherry Tomato-1	Northern Indian Plains in green houses.
3.	Tomato	Improve Bhagya	Punjab, Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh, Maharashtra and Goa.
4.	Tomato Hybrid	KTH-304 (Kaveri Tomato Hybrid-304)	Punjab, Uttar Pradesh, Bihar and Jharkhand.
5.	Tomato	Kashi Amul (VRT-1202)	Karnataka, Tamil Nadu and Kerala.
6.	Garden Pea	Palam Triloki (DPPA-8E)	Himachal Pradesh.
7.	Garden Pea	Palam Sumool (DPPM-64)	Himachal Pradesh.
8.	Onion	Bhima Light Red	Karnataka and Tamil Nadu.
9.	Onion	Bhima Safed	Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan and Tamil Nadu.
10.	Onion	Gujarat Junagadh White Onion-3 (GJWO-3)	Gujarat.
11.	Onion	Gujarat Anand White Onion-2 (GAWO-2)	Gujarat.
12.	Garlic	Bhima Omkar	Delhi, Gujarat, Haryana and Rajasthan.
13.	Garlic	Bhima Purple (NRCRG-1)	Delhi, Uttar Pradesh, Haryana, Bihar and Punjab, Maharashtra, Karnataka and Andhra Pradesh.
14.	Garlic	Gujarat Anand Garlic-6 (GAG-6)	Gujarat.
15.	Garlic	Gujarat Junagadh Garlic-5 (GJG-5)	Gujarat.
16.	Cardamom	Appangala-2 (NHY 35)	Karnataka & Kerala.
17.	Turmeric	IISR PRAGATI	Kerala, Tamil Nadu, Andhra Pradesh, Telanagana, Karnataka, and Chhattisgarh.
18.	Turmeric	GNT-2 (NVST-64)	Gujarat.
19.	Fennel	Ajmer Fennel-2 (AF-2)	All Fennel growing areas of India.
20.	Black Pepper	Panniyur 9 (Cul. 5308)	Kerala, Karnataka and Andhra Pradesh.
21.	Ginger	Mohini (UBKV AADA-1)	Kerala, Odisha, Himachal Pradesh and West Bengal.
22.	Okra Hybrid	Gujarat Junagadh Okra Hybrid-4	Rajasthan, Gujarat, Haryana and Delhi.
23.	Dil Seed	Gujarat Anand Vegetable Dil Seed 1 (GAVD 1)	Gujarat.
24.	Brinjal	Gujarat Junagadh Brinjal-3 (GJB-3)	Gujarat.
25.	Brinjal	Gujarat Anand Brinjal Hybrid-3 (GABH 3)	Gujarat.

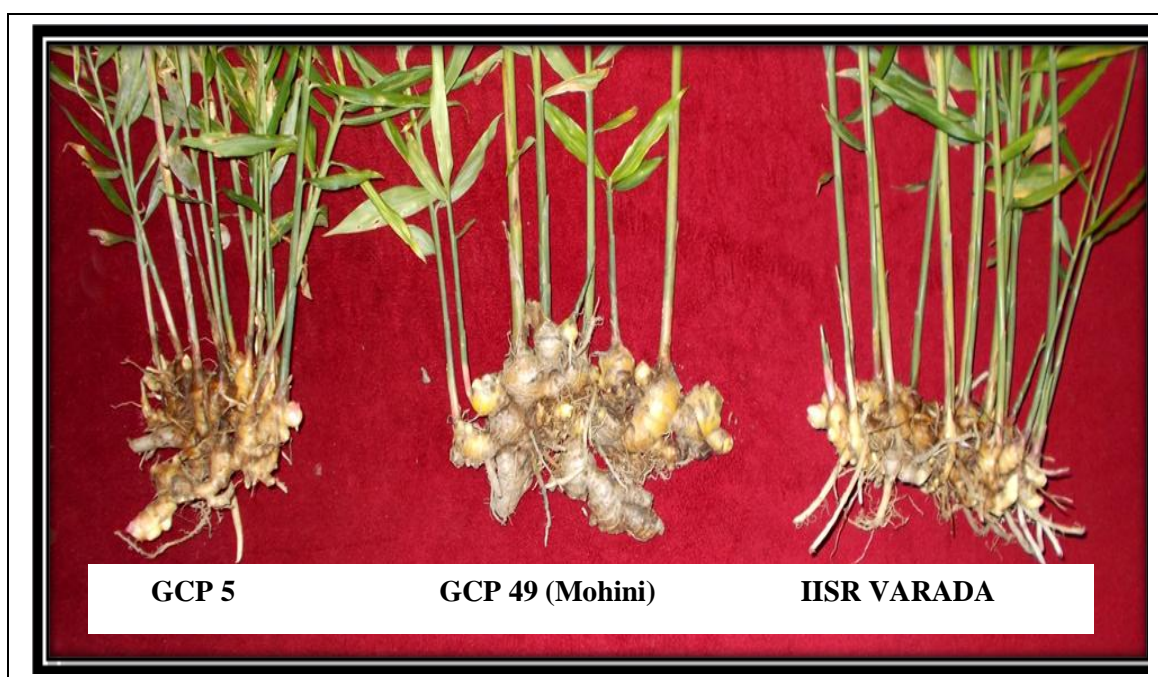
[F. No. 3-55/2017-SD.IV]

Dr. B. RAJENDER, Jt. Secy.

VARIETAL RELEASE PROPOSAL OF GINGER

UBKVAADA-1(GCP49)-(IC-0614552)

Popular Name: MOHINI



**SUBMITTED TO CENTRAL VARIETAL RELEASE
COMMITTEE**

By

**AICRP ON SPICES, UTTAR BANGA KRISHI
VISWAVIDYALAYA, PUNDIBARI,
COOCHBEHAR, WEST BENGAL - 736165**

Soumendra Chakraborty 22/03/2017
Signature Breeder

Dr. Soumendra Chakraborty
Assistant Professor
AICRP on Spices
Genetics and Plant Breeding
Uttar Banga Krishi Viswavidyalaya
Pundibari, Cooch Behar, West Bengal

Sanchari Ballo
Signature of Head of the Division 22/03/2017

AICRP on Spices
Uttar Banga Krishi Viswavidyalaya
Pundibari, Cooch Behar-736165

Ch. 22 Mar 17
Signature of the Head of the Institution

Vice-Chancellor
Uttar Banga Krishi Viswavidyalaya
Pundibari, Cooch Behar-736165 (W.B.)

Signature of the Project Co-ordinator,

All Indian Co-ordinated Project on Spices,

Indian Institute of Spices Research, Kozhikode, Kerala
Kerala Council of Agricultural Research
P.O. Marikunnu P.O. Marikunnu
Kozhikode-673012 Kozhikode-673012

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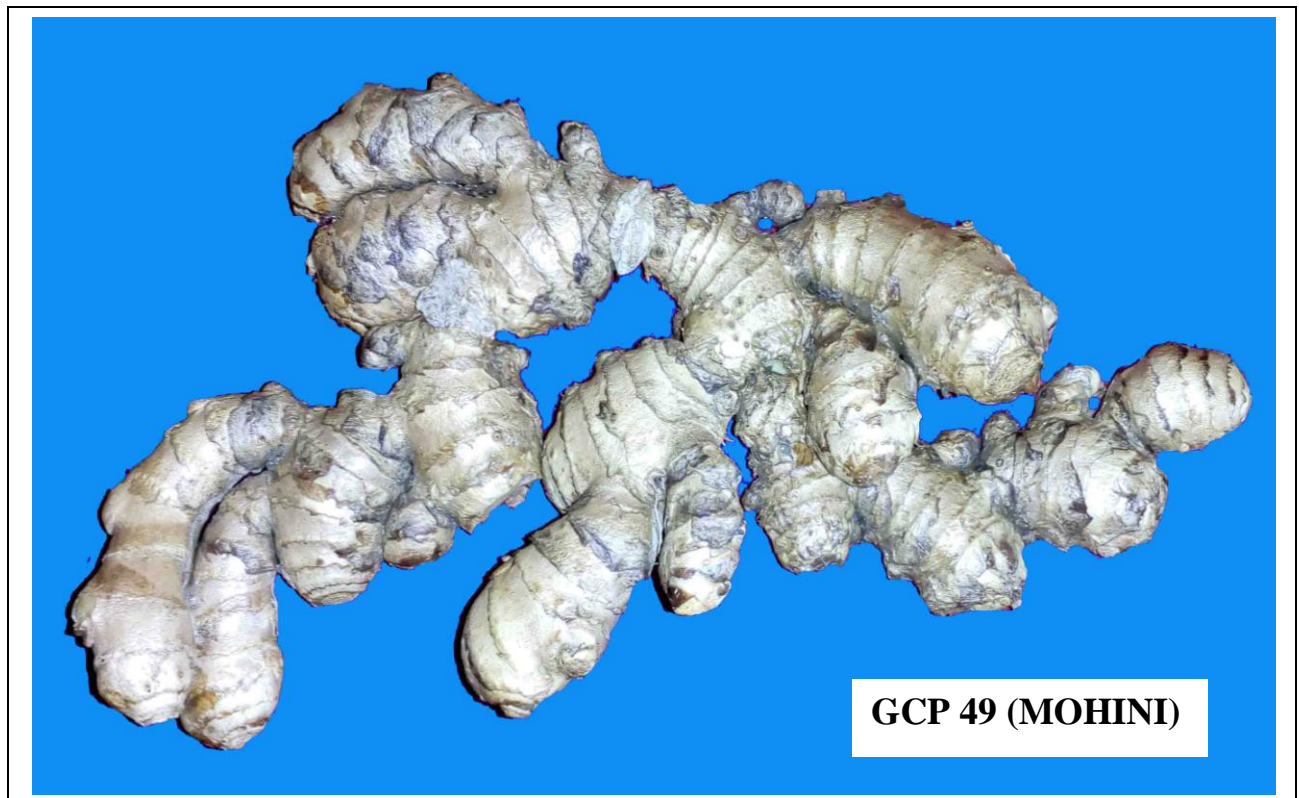
डा.के. निर्मल बाबू
Dr. K. Nirmal Babu
निदेशक Director

भारतीय मसाला फसल अनुसंधान संस्थान
Indian Institute of Spices Research
Kerala Council of Agricultural Research
P.O. Marikunnu P.O. Marikunnu
Kozhikode-673012 Kozhikode-673012

Objectives

Development of ginger genotype with

- Bold rhizome
- High yield potential - 14.0t /ha
- High dry recovery percentage – 21.7%



SUBMISSION OF PROPOSAL OF RELEASE OF CROP VARIETY TO CENTRAL SUB-COMMITTEE ON CROP STANDARDS, NOTIFICATION AND RELEASE OF VARIETIES (CENTRAL VARIETIES)

1.	Name of the species	Ginger (<i>Zingiber officinale</i> L.)
2.	(a) Name of the variety Under which tested. (b) Proposal name of variety	GCP 49 (IC-0614552) Mohini (UBKV AADA -1)
3.	Sponsored by	ICAR-AICRP on Spices, Pundibari Centre
4.	(a) Institution or agency responsible for developing variety (with address).	AICRP on Spices, Uttar Banga Krishi Viswavidyalaya, Pundibari, Dist. Coochbehar. West Bengal. Pin 736165
	(b) Name of the persons who helped in the development of variety i) Name of developers	Soumendra Chakraborty, Suchand Datta, Anamika Debnath, Sekhar Bandyopadhyay, Jagadish Chandra Jana, Surajit Khalko and Bharat Chandra Saha
	ii) Name of cooperators	Murari Krishna Roy and Samsul Haque UBKV, Pundibari; D Prasath, B Sasikumar, HJ Akshitha, IISR, Kozhikode; Parshuram Sial, High Altitude Research Station, OUAT Pottangi; Happy Dev Sharma, Meenu Gupta and Vipin Sharma YSPU H&F, Solan; S.P. Singh, A.K. Misra, RAU Dholi, Bihar.
5.	(a) Parentage with details of its pedigree	The variety has been developed through clonal selection from genotype GCP-49 (IC-0614552). It was collected from Morol Para (26°9'N.89°27'E, 41m) of Cooch Behar district in the state West Bengal in 2007.
	(b) Source of material in case of introduction IC/EC No./Designation of parental lines should be clearly mentioned. In case the variety has been developed from local landrace/traditional variety its source (village, district, State, should be given).	The variety GCP-49 (IC-0614552) has been developed from local landrace which was collected from Morol Para (26°9'N.89°27'E, 41m) of Cooch Behar district in the state West Bengal in 2007.
	(c) Breeding method used.	Clonal selection

	(d) Breeding objective.	Identification of ginger genotype with bold size, high yield and high dry recovery percentage.
6.	State the varieties which most closely resemble proposed variety in general characteristics.	Garubathan (The distinguishable DUS characters are given in Annexure I)
7.	<p>(a) Whether recommended by seminar/conference/workshop/SVRS.</p> <p>(b) If so, its recommendations with specific justification for the release of proposed variety.</p> <p>(c) Specific areas of its adaptation.</p>	<p>a) The genotype has been recommended by Institute Germplasm Committee 2016 for submitting proposal to AICRPS for its high yield, high dry recovery percentage and high oleoresin content.</p> <p>b) The genotype is recommended because of its performance in high dry recovery percentage content along with high yield and high essential oil content across all the centers.</p> <p>Among all the genotypes evaluated, GCP 49 performed consistently well with highest overall mean yield among other genotypes in all the three years. Highest yield per hectare was recorded (Table 4). The high oleoresin % and highest essential oil percentage among genotypes is also found in this genotype compared to National check Varada and local check of all centres in three years pooled data (Table 5).</p> <p>c) The variety is suitable for ginger growing areas of Kerala, Orissa, Himachal Pradesh and West Bengal.</p>
8.	Recommended Ecology	Ginger growing areas of the country both under irrigated and rainfed conditions.

9.	<p>Description of variety/hybrid.</p> <p>(a) Plant height</p> <p>(b) Distinguish morphological characteristics.</p> <p>(c) Maturity group.</p> <p>(d) Reaction of major diseases (under field and controlled conditions).</p> <p>(e) Reaction to major pests (under field and controlled conditions including store pests).</p> <p>(f) Agronomic features (e.g. Resistance to lodging, shattering, fertilizer responsiveness, suitability for early or late sown conditions, seed rate etc.).</p> <p>i) Sowing time</p> <p>ii) Seed rate and spacing</p> <p>iii) Irrigation</p> <p>iv) Fertilizers and manures</p>	<p>57.74 cm.</p> <p>1.Short plant stature 2.Bold primary straight shaped rhizomes and small mother rhizome</p> <p>Long duration</p> <p>-</p> <p>-</p> <p>(f) Detailed in Annexure –II (Package of Practices)</p> <p>i) April-May.</p> <p>ii) Whole or split mother and finger rhizomes are used for planting. A seed rate of 2,000 kg of rhizomes is required for planting one hectare. Spacing for raised bed system: 20 cm × 30 cm.</p> <p>iii) In the case of irrigated crop, depending upon the weather and the soil conditions, about 3 irrigations are to be given in soils.</p> <p>iv) Recommended dose of N: P₂O₅: K₂O for ginger cultivation is 60:90:60 Kg/ha. Recommended doses of P₂O₅ and half of N and K₂O were applied at the time of planting. The rest half of N was applied in 2 equal split doses at 45 and 90 days after planting. The rest K₂O was applied in one split dose at 90 days after planting.</p>
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	<p>i) Quality of produce</p> <p>(g) Quality of produce of grain, forage/fibre including nutritive value wherever relevant.</p> <p>(h) Reaction to stresses.</p>	<p>i) The primary active constituent of ginger is an important secondary metabolite namely essential oil and oleoresin. High dry recovery percentage is also considered as one of the good quality parameters for evaluation of ginger. The variety is most stable for yield and highest dry recovery (21.7%) along with high percentage of oleoresin (4.1%), highest essential oil content (1.3%) across environments (Table 5).</p> <p>(g) NA</p> <p>(h) NA</p>
10.	Description of parents of the variety\hybrid	Clonal selection from germplasm accession, GCP-49 (IC-0614552). It was collected from Morol Para (26°9'N.89°27'E, 41m) of Cooch Behar district in the state West Bengal.
11.	<p>(a) Yield data in regional/interregional/district trails year wise (levels of fertilizer application, density of plant populations and superiority over local/standard varieties to be indicated.</p> <p>(b) Yield data from national conditions demonstration/large scale demonstrations.</p> <p>(c) Average yield under normal conditions.</p>	<p>(a) Table 1-3 (AICRPS Initial Varietal trial with details indicated and superiority over local/standard varieties evaluated and indicated.</p> <p>(b) Table 3-5 (AICRPS Co-ordinated varietal trial demonstration indicated.</p> <p>(c) 14.0 t/ha (Fresh yield)</p>
12.	<p>(a) Agency responsible for maintaining breeder seed.</p> <p>(b) Quantity of breeder seed in stock.</p>	<p>(a) Uttar Banga Krishi Viswavidyalaya, Pundibari, West Bengal. Pin 736165.</p> <p>(b) 1000kg.</p>
13.	Information on acceptability of variety by farmers/consumers/ industry.	The variety has high essential oil and high dry recovery. It has out yielded national check IISR Varada (National Check) in all the centres in quality parameters like dry recovery percentage, essential oil content, oleoresin percentage content. In case of overall mean value for yield among all the genotypes also, it ranks first and out-yielded all the genotypes along with both national and local check.
14.	Specific recommendation if any for seed production	Nil
15.	Any other pertinent information	DNA fingerprinting of Mohini (UBKV AADA -1) (GCP 49 -IC-0614552) is underway.

16.	. Acknowledgement particulars about the submission of germplasm samples with NAG or NBPGR	ICAR-IISR (Indian Institute of Spices Research – Kozhikode)) is recognized as NAGS (National Active Germplasm Site) for Spices and the proposed variety will be sent to NAGS. It will be submitted to NBPGR as well as it is recommended in the XXVII workshop held in NRCSS Rajasthan.
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Signature Breeder

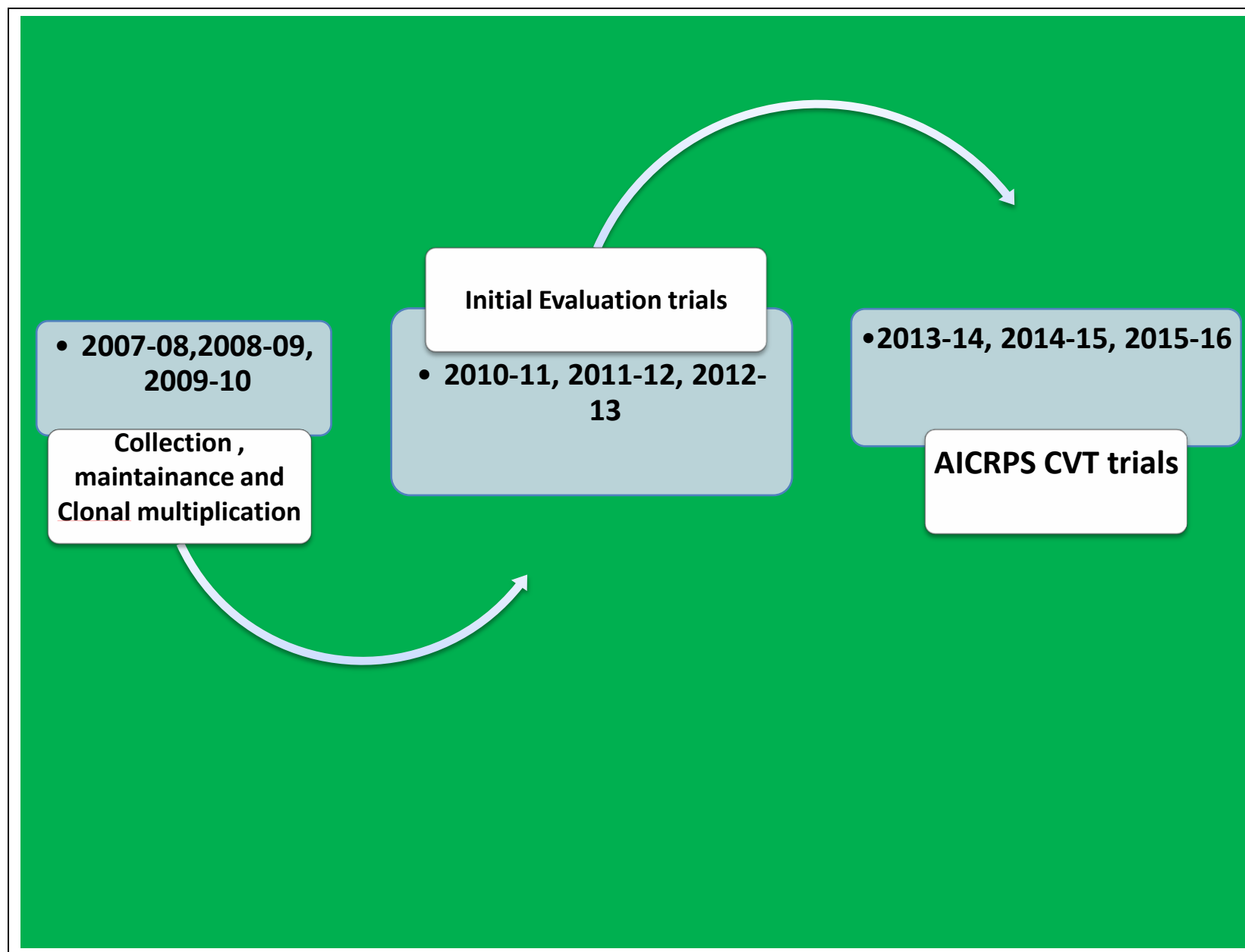
Signature of Head of the Division

Signature of the Head of the Institution

Signature of the Project Co-ordinator,

All Indian Co-ordinated Project on Spices,

Indian Institute of Spices Research, Kozhikode, Kerala



INITIAL EVALUATION TRIAL



Initial Evaluation Trials- (2010-2013)

Genotypes	: 11
Check	: Garubathan
Design	: RBD
Replication	: 3
Years	: 3 (2010-2013)

Accs.: GCP-1, GCP-8, GCP-9, GCP-12, GCP-14, GCP-28,GCP-33, GCP-45, GCP-48, GCP-49 and GCP-54.

Recommended package of practices were followed and observations were recorded on various morphological, yield and yield contributing characters.

The data were subjected to statistical analysis (Panse and Sukhatme, 1978).

Table 1: Initial Evaluation of ginger accessions for morphological characters (2010-2013)

Entries	Plant height (cm)	Tiller No.	Leaf No.	Leaf length (cm.)	Leaf Breadth (cm.)
	Mean	Mean	Mean	Mean	Mean
GCP-1	41.43	3.87	12.55	17.17	1.56
GCP-8	57.68	8.31	18.48	17.91	2.23
GCP-9	55.09	12.65	16.59	16.55	1.66
GCP-12	59.07	8.22	18.96	17.20	2.04
GCP-14	63.00	7.18	19.63	18.88	2.08
GCP-28	53.34	9.13	15.52	23.01	2.13
GCP-33	36.00	3.80	11.41	18.87	2.03
GCP-45	56.51	7.59	17.04	22.85	2.33
GCP-48	65.57	7.74	20.30	25.61	2.31
GCP-49	57.74	7.37	18.74	22.95	2.04
GCP-54	53.98	5.30	16.70	19.69	2.19
Gorubathan (Local check)	54.24	8.04	16.74	18.58	2.36
SEm (\pm)	4.47	1.03	1.59	1.92	0.114
CD (0.05)	13.20	3.04	4.71	5.67	0.338
CV%	14.22	24.18	16.37	16.69	9.524

Table 2: Initial Evaluation of ginger accessions for yield (2010-2013)

Entries	Yield / plant (g)	Yield/plot (Kg/3m ²)	Projected yield (t/ha)
	Mean	Mean	Mean
GCP-1	84.26	2.33	4.70
GCP-8	179.93	6.15	12.42
GCP-9	138.33	3.48	7.02
GCP-12	156.52	4.88	9.85
GCP-14	164.81	4.53	9.15
GCP-28	108.06	2.36	4.76
GCP-33	113.18	2.30	4.64
GCP-45	176.71	4.12	8.32
GCP-48	192.72	5.22	10.54
GCP-49	230.30	7.37	14.89
GCP-54	92.81	4.00	8.08
Gorubathan (Local check)	130.63	5.05	10.20
S.Em (±)	14.44	0.43	0.87
CD (0.05)	42.64	1.28	2.59
CV %	16.98	17.49	17.49

Table 3A: Stability analysis for yield (IET)

(Eberhart and Russell model, 1966)

Pooled ANOVA for stability mean for yield characters

Source of Variation	DF	Mean Squares	Sum of Squares	F-Calculated
Cultivars (G)	11	7.28	80.15	13.36**
Environment (E)	2	10.82	21.64	19.85**
Genotype \times Environ.	22	0.54	11.99	11.99**
Env.+Var. \times Env.	24	1.40	33.63	33.64**
Env. (Linear)	1	21.64	21.64	21.64**
Env. \times Var.(Linear)	11	0.99	10.97	10.97**
Pooled Deviation	12	0.085	1.018	1.018
Pooled Error	66	0.95	62.71	

** significant at 1% level of significance

Table 3B: Stability analysis for mean value, regression coefficient of all the accessions under IET

Genotypes	Mean	Reg. Coefficient (b)	Stability Parameter S^2_{di}
GCP-1	2.332	0.115	0.037
GCP-8	6.148	1.638	0.110
GCP-9	3.718	7.717	0.530
GCP-12	4.882	1.946	0.050
GCP-14	4.534	5.016	0.054
GCP-28	2.364	2.597	0.021
GCP-33	2.302	0.329	0.001
GCP-45	4.124	1.193	0.007
GCP-48	5.217	0.102	0.101
GCP-49	7.373	0.972	0.064
GCP-54	3.996	5.663	0.042
Gorubathan	5.054	3.779	0.010

Analysis and conclusion

- From the stability analysis of yield character, $G \times E$ interaction effect was found minimum (Table 3A).
- GCP 49 consistently resulted highest fresh yield (14.89 t/ha) than other genotypes and from the local check Garubathan (GCP-5) under IET trial.
- This evaluation resulted for selection of GCP-49 for All India CVT trials (2013-16).
- GCP 49 has found to have highest stability among other genotypes (Table 3B) in all the three years.

Pooled data of ginger Co ordinate Varietal trial of AICRPS in all centres

GIN/CI/2.3: Co-ordinated Varietal Trial in Ginger (2013-2016)

Design: RBD , Replication- 3 , No. of entries- 11

Plot size- 3m × 1m

Spacing- 30cm × 25 cm

Date of sowing- May' 2015

Centres Involved:- IISR, Solan, Pundibari, Pottangi & Dholi

Years : 2013-16

Genotypes tested:

V₁S₁-2 (Pottangi) , RG-3 (Dholi), RG-32 (Dholi) , Acc-219(IISR), Acc-65(IISR), Varada (NC), GCP-49 (Pundibari), LC (local check)

Recommended package of practices were given and yield and other quality parameters were tested.

GIN/CI/2.3: Co-ordinated Varietal Trial in Ginger -2013

Table 4: Pooled Mean performance of genotypes over location from 2013-14 to 2015-16 across centres

Entries	Fresh rhizome Yield (t/ha)						% increase over National Check	% increase over Local Check
	IISR	Pottangi	Pundibari	Dholi	Solan	Mean		
Acc-65	19.4	12.8	10.1	1.5	7.8	10.3		
Acc-219	16.8	7.7	7.0	1.2	6.6	7.9		
VIS1-2	15.1	14.3	13.8	2.0	9.1	10.8		
GCP-49	20.1	14.1	25.4	1.2	9.2	14.0	59.09	42.85
RG-3	18.3	11.8	11.2	5.1	9.8	11.2		
RG-32	14.1	13.9	4.4	5.0	7.7	9.0		
Varada	14.7	12.7	6.1	0.9	9.6	8.8		
Local Check	12.0	12.9	8.3	3.7	12.2	9.8		
Mean	16.5	12.3	12.3	2.6	9.0	10.5		
Local Check	Rio de ganeiro	Suprabha	GCP-5 Garubathan	Nadia	Giriganga			
SEM (±)	1.28	0.5	0.82	0.6	0.18			
C.D.(0.05)	4.56	1.9	2.94	2.14	0.63			
C.V. (%)	16.5	9.3	14.1	49.38	4.13			

Table 5: Details of Pooled data of 2013-14, 2014-15 and 2015-16 of dry recovery(%), essential oil content, oleoresin content and crude fibre (%) of Ginger CVT trials

Collection	Dry Recovery (%)	Essential Oil (%)	Oleoresin content (%)	Crude fibre (%)
	Mean	Mean	Mean	Mean
Acc-219	20.4	1.1	4.2	4.9
Acc-65	19.6	1.0	3.7	4.7
V₁S₁-2	21.1	1.2	4.2	4.3
RG-32	21.1	1.3	4.3	5.2
RG-3	21.4	1.0	3.9	4.4
GCP-49	21.7	1.3	4.1	5.3
Varada (NC)	20.6	1.0	3.5	4.2
Girignga (LC)	20.9	1.4	4.1	5.3
SEM(±)	0.08	0.11	0.09	0.18
CD (0.05)	0.23	0.34	0.19	0.39
C.V.(%)	3.18	1.33	2.70	4.76



Fig. 1: Comparison of plants with rhizome of local check (GCP-5), GCP-49 –Mohini (Proposed Variety) and National Check (IISR VARADA)

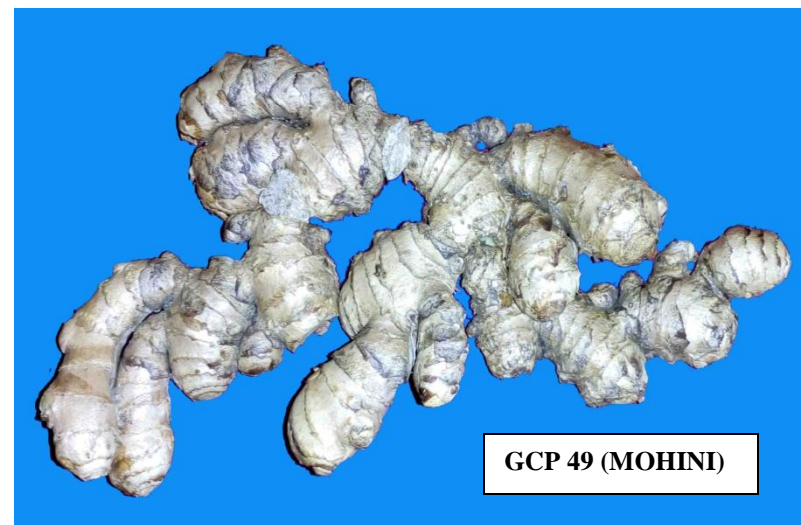


Fig. 2: Rhizomes of GCP -5 and GCP-49

Salient features of Mohini (GCP-49)





Bold Rhizomes

High dry recovery - 21.7 %

High Oleoresin content - 4.1 %

High yield potential

14 t /ha



Annexure I

Distinguishable DUS characters

S No.	Characteristics	States	Garubathan	GCP 49
1.	Plant: Growth habit	Erect Semi-erect Spreading	Erect	Erect
2.	Plant: Height (cm)	Short (<100) Medium (100 – 120) Tall (>120)	Short	Short
3.	Plant: Number of shoots	Few (<10) Medium (10 - 15) Many (>15)	Few	Few
4.	Plant: Height of shoot (cm)	Short (<75) Medium (75 - 90) Tall (> 90)	Short	Short

5	Shoot: Diameter (cm)	Narrow (<3) Medium (3 - 5) Broad (>5)	Narrow	Medium
6	Shoot: Intensity of green colour	Light green Green Dark green	Green	Green
7	Shoot: Number of leaves on main shoot	Few (<25) Medium (25-35) Many (>35)	Few	Few
8	Leaf: Length (cm)	Short (<25) Medium (25 - 30) Long (>30)	Short	Short
9.	Leaf: Width (cm)	Narrow (<2.5) Medium (2.5 – 3.5) Broad (>3.5)	Narrow	Narrow
10.	Leaf: Intensity of green	Light green Green	Dark green	Green

	colour	Dark green		
11.	Leaf: Petiole length (cm)	Short (<0.5) Medium (0.5-0.7) Long (>0.7)	Short	Short
12.	Spike: Length (cm)	Short (<25) Medium (25 - 35) Long (>35)	Short	Short
13.	Colour of the bract tip of fully developed spike	Crimson Yellowish-white tip	Yellowish-white tip	Yellowish-white tip
14.	Rhizome: Thickness (cm)	Thin (<2) Medium (2-3) Bold (>3)	Medium	Bold
15.	Rhizome: Shape	Straight Curved Zigzagged	Straight	Straight

16.	Crop duration(days)	Short (<200) Medium (200-210) Long (>210)	Long	Long
17.	Dry recovery (%)	Low (<16) Medium (16-18) High (>18)	Medium	High

Annexure-II

Package of Practices

Area and Production of Ginger:

Ginger is important spice crop of India and accounts for 45 % of the worlds ginger production. Mainly grown in Kerala, Orissa, Meghalaya, West Bengal, Karnataka, Tamil Nadu, Bihar, Himachal Pradesh, Uttar Pradesh and Maharashtra. Area under cultivation in India is about 63,000 ha with total production of about 2 lakh tones. The average productivity is about 3 tones/ha.

Soil:

Deep, well-drained, friable, loamy soil, rich in humus is required for ginger.

Land Preparation:

- 1) Land is ploughed 2 times (crosswise) in summer (March - April) to a depth 15 to 22 cm
- 2) 3-4 crosswise harrowing are given to make soil loose and friable.
- 3) 10 tons of FYM/ha is applied before last harrowing.

Land is divided into raised beds of 1 m width and of convenient length of 3 m and 15 cm height with spacing of 50 cm between beds for drainage channel.

Propagation:

Ginger is propagated by using portions of mother rhizomes. Each healthy rhizome to be used for planting should be 4 to 5 cm long, weighing 25 g and having two or three buds each.

Seeds and Sowing:

a) Selection of Planting Material:

- 1) Select healthy rhizomes free from diseases (rhizome rot and leaf spot) and pests (rhizome fly).
- 2) Sprouted rhizomes are broken into pieces keeping 2-3 sprouted eye buds on each rhizome.

b) Time of Planting:

- 1) Ginger can be planted from middle of April up to middle of May.
- 2) Last week of April is found to be the best time for planting of ginger at Pundibari.
- c) Seed rate: Seed rate of 2 tonnes of rhizomes is required for planting one hectare. In general, the seed rhizomes were treated with mancozeb @ 0.3% before planting to maintain the recommended package of practices.

Methods of Planting:

Ginger seed rhizomes were planted in raised beds of 3 m × 1 m. The plant to plant and row to row spacing were 20 cm and 30 cm, respectively. Split mother rhizomes of 25g each were used for planting at one point.

Manures and Fertilizers:

The recommended dose of fertilizer Meghalaya is N: P₂O₅: K₂O: 60:90:60 kg/ha and FYM @ 10 t/ ha (Jayashree *et al.*, 2014). As Coochbehar is in the north eastern region, similar dose is also recommended here.

Recommended doses of P₂O₅ and half of N and K₂O were applied at the time of planting. The rest half of N was applied in 2 equal split doses at 45 and 90 days after planting. The rest K₂O was applied in one split dose at 90 days after planting.

Irrigation:

Since, Pundibari, Coochbehar is a heavy rainfall area, no irrigation is given here. In dry areas, 3 irrigations may be given at 90, 120 and 150 days after planting.

Intercultural operations:

a) Mulching:

It is followed in rain fed crop to prevent weed growth, for protection from sun, preventing evaporation losses, to maintain soil temperature for protection from heavy rains and for consequent enhancement of organic matter. Mulching of the planted beds is done by paddy or wheat or mustard straw.

b) Weeding:

- 1) The plot is kept clean by hand weeding.
- 2) Depending upon intensity of weeds, 5-6 weeding are given to have better yield.

c) Earthing-up:

Earthing up was done at 90 days after planting. Another earthing up is done afterwards as and when required. This second earthing up is done in the years and areas of heavy rainfall.

Harvesting:

- 1) Harvesting is done 210-215 days after planting.
- 2) The rhizomes are lifted either with digging fork or using *kudali* and are cleaned-off the roots and adhering soil particles.

Reference:

Jayashree, E., Kandiannan, K., Prasath, D., Rashid, Pervez, Sasikumar, B., Senthil Kumar, C.M., Srinivasan, V., Suseela Bhai, R. and Thankamani, C.K. (2014). Ginger (Extension Pamphlet). Published by M. Anandaraj, Director, ICAR-Indian Institute of Spices Research, Kozhikode, p. 3.