

## VARIETAL SCREENING IN GINGER

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Next to Pepper, Ginger (*Zingiber officinale* Rosco.) is the most important spice item exported from India the largest producer and exporter of ginger accounting for 50 per cent of the World production. Ginger oil and oleoresin have shown an encouraging increase in the quantum of export during the recent past. There is an urgent need for increasing ma production of ginger oil and oleoresin to cater to the increasing demand in the World market.

The use of oleoresin, a sterile product, provides a solution to the unhygienic nature of other products. The pungency or flavour of oleoresin can be adjusted to the required strength thereby providing uniformity of flavour and avoiding hot-spots involved in the case of ground spice. It is of considerable importance that the recommended variety should have high yielding potential and superior quality attributes.

It has already been reported by several workers like Natarajan *et al.* (1970), Krishnamurthy *et al.* (1970), Muralidharan (1972), Lewis *et al.* (1972) and Mathew *et al.* (1972) that there existed considerable variation in the quality of ginger of different types. The present study was, therefore, conducted to screen the ginger types based on their yield, oleoresin, oil and crude fibre contents.

### Materials and Methods

From the germplasm collection of ginger maintained at the College of Horticulture, 25 types were selected on the basis of results of a preliminary screening and these were used for the study. The design adopted was 5 x 5 lattice with four replications. The Package of Practices recommended by the Kerala Agricultural University (1978) were adopted. The crop was planted in 5th May 1977 and harvested on the 255th day. The samples were analysed for oleoresin, oil and crude fibre by adopting the Official Analytical Methods of American Spice Trade Association (1960). The data were analysed statistically.

### Results and Discussion

Yield per hectare of green and dry ginger, drying percentage, percentage of oleoresin, oil and crude fibre and their yield per hectare are furnished in Table-1.

In the case of yield of dry ginger the type 'Nadia' ranked first with an average yield of 6453.16 kg per hectare followed by 'Bajpai' (5094.36 kg), 'Maran'

(5042,01 kg) and 'Narasapattam' (4801.44 kg). The minimum yield of 1133.53 kg was recorded in the type 'Uttar Pradesh' closely followed by 'Tafingiva' (1323.06 kg).

It was observed that the drying percentage varied significantly among types. The type 'Thiruvappan' recorded the maximum drying percentage of 25.20 followed by 'Kuruppampady' (23.00%), 'Arippa' (22.80%); and 'Nadia' (22.60%). The dryage was minimum in 'Karakal' (15.20%) though not significantly different from 'Tafingiva' (17.00%), 'Assam' (18,00%), 'Wynad Local' and 'Rio-de-Janeiro' (18,60%). The variety 'Tura' was earlier reported to give highest recovery of dry ginger (Mathai, 1973; Nair, 1969 and Nair, 1975). The poor drying percentage of the type 'Rio-de-Janeiro' was recorded by several workers (Kannan and Nair, 1965; Mathai, 1973; Muralidharan, 1974 and Nair, 1975). The higher fibre contents may be the factor contributing to the variations in the percentage of dry ginger recovery.

There existed highly significant variation in oleoresin percentage among types. 'Rio-de-Janeiro' contained the maximum oleoresin (10.53%) and this was on par with 'Maran' (10.05%). 'Bajpai' (9.22%), 'Wynad Local' (9.14%) and 'Valluvanad' (8.78%) were the other types high in oleoresin content. Oleoresin recovery was minimum in the type 'Wynad Local' (4.91%) followed by 'Himachal Pradesh' (5.39), 'Arippa' (5.42%), 'Siera Leon' (5.83%), 'Vengara' (5.85%), 'Ernad Chernad' (5.98%) and 'Taiwan' (5.98%) and these types did not differ significantly. The present observation which revealed the superiority of the type 'Rio-de-Janeiro' for oleoresin recovery is in agreement with the findings of Lewis *et al.* (1972), Mathai (1973), Lewis (1973) and Muralidharan (1974).

'Maran' ranked first in the case of oleoresin production per hectare (504.2kg) followed by 'Bajpai' (4677kg), 'Nadia' (349.1kg) and 'Rio-de-Janeiro' (345.8 kg) while the type 'Uttar Pradesh' was the least in the list. Though the type 'Rio-de-Janeiro' had the highest oleoresin percentage, the yield of dry ginger was relatively poor (3284.0kg/ha) and this has contributed to the reduction in the total out-turn of oleoresin. But in the type 'Uttar Pradesh' both oleoresin percentage and dry ginger recovery were low. The genetic character will definitely have an impact on the yield of oleoresin, which may be the reason for the differential oleoresin recovery among types under identical environment and uniform cultural and manurial treatments.

It may be seen from the Table that the types differ significantly in oil recovery, the highest percentage being recorded in 'Karakal' (2.40%) followed by 'Rio-de-Janeiro' (2.30%). These two were on par. 'Himachal Pradesh' (0.57%) and 'Uttar Pradesh' (1.25%) were poor in oil recovery also. According to Mathew *et al.* (1972) 'Rio-de-Janeiro' excelled all other types in yield of oil (2.50%) followed by 'Mysore' (2.10%) and 'Wynad Manantody' (2,00%).

**Table -- 1** Quantitative and qualitative characters of ginger types

Types	Green ginger yield/ha (kg)	Drying (%)	Dry ginge yield/ha (kg)	Oleoresin (%)	Oleoretin yield/ha(kg 1	Oil% yield/ha(kg)	Oil yield/ha(kg)	Fibre (%)
<b>Valluvanad</b>	19133.6	18.60	3558.8	8.78	312.4	2.20	78.3	4.21
Vengara	11380.2	19.60	2230.5	5.85	130.4	2.30	51.7	4.45
Ernad Chernad	18267.3	20.00	3653.4	5.98	218.4	1.72	62.8	5.60
Ernad Manjeri	13942.7	21.60	3669.4	8.09	341.7	1.75	73.8	4.74
Wynad Local	19531.2	18.40	4218.7	9.14	335.3	1.60	62.3	5.75
Wynad-Kunnamangalam	18057.2	22.40	4044.8	6.52	263.7	1.49	60.2	6.00
Bajpai	23585.0	21.60	5094.3	9.22	469.7	1.48	75.4	4.52
Karakal	20182.2	15.20	3067.7	6.23	191.1	2.40	71.7	5.70
Taiwan	10914.9	21.20	2313.9	5.98	138.3	1.66	39.1	4.65
Tafingiva	7517.3	17.60	1323.0	7.92	104.7	0.74	11.1	5.72
Siera Leon	10750.0	21.60	2322.0	5.83	135.3	1.70	39.9	4.87
Thodupuzha	8479.1	25.20	2119.7	6.38	135.2	1.62	36.4	4.46
Maran	25210.0	20.00	5042.0	10.05	504.2	1.94	97.8	6.17
Rio-de-Janeiro	17656.2	18.60	3284.0	10.53	345.8	2.30	62.7	5.60
Wynad Manantody	12250.0	19.40	2376.5	4.91	166.6	1.94	46.1	4.28
<b>Kuruppampady</b>	9571.1	23.00	2201.3	8.00	176.1	1.79	37.2	6.47
Arippa	2743.0	22.80	1765.4	5.42	95.6	1.70	30.0	4.07
Thingpuri	8522.5	19.40	1653.3	7.42	122.6	2.20	36.3	5.59
Uttar Pradesh	5296.9	21.40	1133.5	6.05	68.6	1.25	14.2	3.79
Himachal Pradesh	7277.7	22.10	1608.3	5.39	86.6	0.57	12.7	3.89
Jorhat	17048.6	21.40	3648.4	6.26	228.3	1.72	62.7	4.45
Narasapattom	23536.4	20.40	4801.4	6.79	326.0	1.25	60.0	5.38
Nadia	28553.8	22.60	6453.1	5.41	349.1	1.48	95.5	3.90
China	9548.6	21.00	2005.2	7.00	140.3	1.90	38.1	3.47
Assam	11786.4	18.00	2121.5	7.29	154.6	2.22	47.1	5.82
F - Value		3.61**		7.00**		3.62 <sup>s</sup>		23.64**
CD - (p = 0.05)		4.60		1.79		1.68		0.66

\*\*Significant at 1 % level

With regard to total yield of oil also 'Maran' topped the list with an average of 97.8 kg closely followed by the type 'Nadia' (95.5kg). The oil yield was minimum in 'Tafingiva' (11.1 kg) followed by 'Himachal Pradesh' and 'Uttar Pradesh'. The higher yields in 'Maran' and 'Nadia' were due to higher dry ginger production of 5042.0kg and 6453.1 kg per hectare respectively. The differences in the oil contents under uniform conditions may also be due to genetical factors.

Significant differences existed among different types of ginger with respect to crude fibre content. The type 'China' recorded the minimum fibre percentage of 3.47, followed by 'Uttar Pradesh' (3.79%), 'Himachal Pradesh' (3.89%) and 'Nadia' (3.90%) whereas the type 'Kuruppampady' (6.17%) had the highest fibre content followed by 'Maran' (6.17%) and 'Assam' (5.82%). This trend is in conformity with earlier reports of Kannan and Nair (1965), Aiyadurai (1966) and Thomas (1966).

**Summary**

Twentyfive ginger types were screened at the College of Horticulture, Vellanikkara during 1977-78 for the yield and quality attributes such as drying percentage, oleoresin, oil and crude fibre contents. There was highly significant differences in yield, drying percentage, oleoresin, oil and crude fibre contents among the types studied. Maximum yield was recorded in the type 'Nadia' closely followed by 'Bajpai', 'Maran' and 'Narasapattom'. The maximum oleoresin percentage was in the type 'Rio-de-Janeiro' and the highest percentage of oil recovery in 'Karakal'. But the yield per hectare of oleoresin and oil was maximum in the type 'Maran'. Crude fibre content was minimum in 'China' and the maximum in 'Kuruppampady'. The type 'Thodupuzha' recorded the maximum drying percentage of 25.20 and minimum in Karakal (15.20%).

The types 'Nadia', 'Bajpsi' and 'Maran' were found to be relatively superior in performance in view of the higher yield of dry ginger, oleoresin and oil contents.

**സംഗ്രഹം**

ഇരുപതു TOT യഞ്ചു വ്യത്യസ്ത ഇഞ്ചിയിനങ്ങളുടെ വിളവിനയും ഗുണനിലവാരത്തെയും സംബന്ധിച്ച ഒരു താരതമ്യപഠനം നടത്തിയതിൽ ഏറ്റവും കൂടുതൽ ചുക്ക് ലഭിച്ചത് 'നടിയ', 'ബാജ്പായ', 'മാരൻ' എന്നീയിനങ്ങളിലാണെന്നു കാണുകയുണ്ടായി. ഓളിയോഹെസിൻ ശതമാനത്തെ സംബന്ധിച്ചിടത്തോളം 'റിയോഡെജനൈറോ', 'മാരൻ' എന്നീ ഇനങ്ങൾ മികച്ചവയായി കണ്ടു. ചുക്കിൽ അടങ്ങിയിരിക്കുന്ന എണ്ണയുടെ അളവ് ഏറ്റവും കൂടിയതിരുന്നതും 'കാരയ്ക്കൽ' എന്നയിനത്തിലായിരുന്നു.

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