

## Screening Cauliflower Varieties for Incidence of Physiological Disorders, Pests and Diseases

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**Abstract:** Significant differences were observed among the varieties for incidence of physiological disorders and least incidence of physiological disorders like riceyness, leafiness, hairiness and buttoning was observed for NS 60N, G 45, Himpriya 60 Himshort and Pusa Meghna. Least incidence of important biotic stress factors like leaf caterpillar (*Spodoptera litura*), *Alternaria* blight (*Alternaria brassicae*), soft rot (*Pythium* sp.) and *Choanephora* rot (*Choanephora* sp.) was observed in NS 60N, Himpriya 60, G 45 and Himshort.

**Keywords:** Physiological disorder, buttoning, riceyness, leafiness, hairiness

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### I. Introduction

Cauliflower (*Brassica oleracea* L. var. *botrytis*) is one of the most important vegetable crops of India which is thermosensitive and requires cooler climate for its cultivation. Weather especially temperature plays a crucial role in curd initiation and maturation of cauliflower. Earlier, cultivation of cauliflower was possible only in the traditional areas i.e., hill tracts and cooler parts of the country. Of late, with the advent of tropical cauliflower varieties, cultivation is made possible in the non traditional areas like plains of Kerala. So many problems like incidence of physiological disorders, pests, diseases were associated with the cultivation of this crop in these non traditional areas. A study on these biotic and abiotic factors which limits cauliflower cultivation in plains of southern Kerala will help to identify and tackle them.

### II. Experimental Layout

A field experiment was carried out at the Department of Olericulture, College of Agriculture, Vellayani (8° 5' N latitude and 77° 1' E longitude) during the period October 2012 to March 2013 to identify tropical cauliflower varieties suitable for plains of southern Kerala. The experimental site was located at an altitude of 29 m above mean sea level and the area enjoys a warm humid tropical climate. In this experiment 12 varieties of cauliflower were evaluated for yield and quality at five replications (Plate 1). One month old seedlings were transplanted into the main field at a spacing of 60 x 60 cm. All cultural operations like weeding, fertilizer application, irrigation, earthing up, spraying of pesticides etc. were done equally in all the plots as required.

Physiological disorders like riceyness, hairiness, leafiness, buttoning, pest like leaf caterpillar (*Spodoptera litura*) and diseases like *Alternaria* blight (*Alternaria brassicae*), soft rot (*Pythium* sp.), *Choanephora* rot (*Choanephora* sp.) and curd rot (*Alternaria brassicae*) were observed during the crop period. Number of plants showing physiological disorders, incidence of pests and diseases were recorded and percentage worked out using the formula.

$$\text{Percentage incidence} = \frac{\text{Number of plants affected}}{\text{Total number of plants}} \times 100$$



Plate 1 Field view of the experiment

### III. Result And Discussion

Cauliflower varieties exhibit variation in their response to fluctuation in temperature especially during curd initiation and development phases leading to several physiological disorders like riceyness, hairiness, buttoning and leafiness. Least incidence of riceyness, leafiness, hairiness and buttoning was observed for NS 60N, G 45, Himpriya 60 Himshort and Pusa Meghna whereas high incidence was noticed for mid season varieties like Pusa Paushja, Pusa Sharad and Pusa Hybrid 2 (Table 1). Similar variation between varieties for incidence of physiological disorders at high temperature was reported by Gopalakrishnan (2004), Kumar *et al.* (2009) and Susheela and Rangaswamy (2011).

Table 1. Response of cauliflower varieties on incidence of physiological disorders

Varieties	Riceyness (%)	Hairiness (%)	Leafiness (%)	Buttoning (%)
Pusa Meghna	16.00	17.00	3.00	0.00
Pusa Sharad	24.00	68.00	15.00	69.00
Pusa Paushja	41.00	36.00	14.00	20.00
Pusa Hybrid 2	3.00	66.00	65.00	75.00
Pusa Shukti	20.00	39.00	30.00	35.00
NS 60 N	13.00	15.00	3.00	0.00
Himshort	16.00	17.00	7.00	0.00
Himlatha	16.00	21.00	10.00	1.00
Himpriya- 60	10.00	24.00	4.00	0.00
Indam 2435	28.00	21.00	11.00	0.00
G 45	12.00	22.00	1.00	0.00
White Snow	14.00	28.00	10.00	1.00
Mean	17.75	31.17	14.42	16.75
CD (5%)	10.320	13.903	11.216	10.888

Temperature, rainfall and relative humidity are the critical climatic factors that have profound effect on incidence of pests and diseases. The above condition influences the activity and seasonal population dynamics of insects (Huffaker *et al.*, 1999; Huey and Berrigan, 2001; Roy *et al.* 2002) and it provides a congenial condition for fungal pathogens causing diseases. Similar situation was experienced in the present study also.

During the course of the study, the important biotic stress factors noticed were leaf caterpillar (*Spodoptera litura*), *Alternaria* blight (*Alternaria brassicae*), soft rot (*Pythium* sp.), curd rot (*Alternaria brassicae*) and *Choanephora* rot (*Choanephora* sp.). High incidence of pests and diseases like leaf caterpillar, *Alternaria* leaf blight, *Choanephora* rot, soft rot and curd rot were observed for certain treatments during the period (Plate 2).



**Plate 2.** Physiological disorders like riceyness, hairiness, buttoning and leafiness, pest like leaf caterpillar and diseases like *Choanephora* rot, *Alternaria* blight, curd rot and soft rot.

Among the varieties low incidence of these pests and diseases were noticed in NS 60N, Himpriya 60, G 45 and Himshort (Table 2). Various workers have reported incidence of the above pests and diseases in cauliflower i.e., leaf caterpillar (*Spodoptera litura*) by Monobrullah *et al.* (2007) and Chand and Tripathi, (2008); leaf blight and curd rot caused by *Alternaria brassicae* by Pandey *et al.* (2002), Kohl *et al.* (2010) and Deep and Sharma (2012); *Choanephora* rot caused by *Choanephora* sp. by Pavgi (1970) and Siddiqui (1974) and soft rot caused by *Pythium aphanidermatum* by Sharma and Sain (2005).

**Table 2.** Response of cauliflower varieties on incidence of pests and diseases

Varieties	Leaf caterpillar (%)	<i>Alternaria</i> blight (%)	Soft Rot (%)	<i>Choanephora</i> rot (%)	Curd rot (%)
Pusa Meghna	28.00	49.00	2.00	22.00	4.00
Pusa Sharad	5.00	9.00	2.00	26.00	8.00
Pusa Paushja	31.00	53.00	3.00	51.00	1.00
Pusa Hybrid 2	28.00	49.00	0.00	61.00	19.00
Pusa Shukti	23.00	35.00	0.00	38.00	5.00
NS 60 N	17.00	28.00	1.00	15.00	1.00
Himshort	24.00	37.00	2.00	23.00	0.00
Himlatha	55.00	46.00	5.00	52.00	6.00
Himpriya- 60	33.76	31.00	3.00	38.00	3.00
Indam 2435	24.00	42.00	6.00	53.00	11.00
G 45	31.00	46.00	2.00	33.00	4.00
White Snow	91.00	46.00	11.00	80.00	11.00
Mean	32.56	39.25	3.08	41.00	6.08
CD (5%)	10.054	9.852	4.451	9.803	7.295

Low incidence of physiological disorders, pest and diseases were observed in NS 60N, G 45, Himpriya 60 and Himshort.

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