

during summer. The percentage increase in oil contents over control were 6.15, 4.05 and 5.66 in *rabi*, summer and *kharif* respectively.

The oil content and oil yield of sunflower did not vary much due to application of different levels of Mg in all the three seasons. The cost benefit ratio was worked out and was found to be 13.42, 7.21 and 9.83 rupees per rupee invested for *rabi*, summer and *kharif* seasons, respectively. Thus, it is clear that S is an important key input in augmenting the yield of sunflower grown on Arfisol.

REFERENCES

- AOAC (1970) Official Methods of Analysis (11th ed.) Associations of official Agricultural Chemists. Washington, D.C.
- DESHMUKH, S.D. (1977). The role of bees in pollinations of sunflower. *Oil Seeds J.*, 6(3): 26-27.
- GHOSH, D.C. and CHATTERJEE, B.N. (1975). Yield variations in sunflower in humid sub-tropics of West Bengal when sown at different times during the year. *J.Soc.Exp. Agric.* 1: 1-4.
- KRISHNAMURTHY, V.V. and MATHAN, K.K. (1996). Effect of sulphur and magnesium on the seed and oil yield of sunflower. *Madras Agric.J.*, 83: (in print)
- KUSHWAHA, J.S. and SHARMA, D. (1973). Sunflower: promising oil seed crop for M.P. *Indian Fmg.*, 23(2): 7.
- PREMSEKAR, S. (1973). Performance of varieties of sunflower at Coimbatore. *Indian J. Agric. Sci.*, 43: 30-32.
- RUDHRA SHEETY, T.H. (1962). Influence of Mg on P availability and on nutrient elements uptake by ragi in three Indian soils, M.Sc.(Ag.) Thesis. Madras University, Coimbatore.
- SINGH, V. (1972). Sunflower cultivations. *Indian Fmg.*, 12(4): 34-35.
- VARISAI MOHAMED, S. and SIVASUBRAMANIAN, P. (1973). Experiments with sunflower -A review *Oil Seed J.*, 3(1): 19-12.

(Received : July 1995 Revised : September 1995)

Madras Agric J., 83(10): 642-643 October 1996
<https://doi.org/10.29321/MAJ.10.A01073>

INHERITANCE OF FLOWER COLOUR AND PETAL SHAPE IN BLUE PEA

A.K.FAZLULLAH KHAN, A. AMIRTHADEVARATHINAM,
D.SUDHAKAR AND P.VAIDYANATHAN

Department of Forage Crops
Agricultural College and Research Institute
Tamil Nadu Agricultural University
Coimbatore 641 003.

ABSTRACT

Clitoria ternatea Linn is a hardy pasture legume. It bears typical clitorious flowers which are either blue or white. However, during a plant survey, a plant type with all the five petals which are broad was identified. The inheritance of the broad shaped petals and their colour was studied and it was found to segregate in a typical dihybrid ratio of 9:3:3:1. Test cross of the F₁ with the double recessive also confirmed the above results.

KEY WORDS : Blue pea, *Clitoria ternatea*, Flower Colour, Petal shape

The *sangupu* or blue pea *Clitoria ternatea* Linn. is a commonly occurring twiner in South India. Apart from its use in medicine and religious rituals, it is also a good leguminous fodder crop for the pastures. The plant bears a typical clitorious flower with a broad standard petal and small wings and keel petals situated at the neck of the standard petal. Two flower colours are normally seen *ie.* blue and white. The literature on *clitoria* is very meagre. Srinivasan (1962) reported on some floral abnormality in this species. The present study is a first report on the genetics of floral characters in *Clitoria*.

MATERIALS AND METHODS

A few years back, a new flower type was observed in a plant during out plant collection survey. The flower was blue in colour but, unlike the typical flower, the wing and keel petals were broad, comparable in size to the standard. It was found to breed true. To study the inheritance pattern of this flower shape, crosses were effected during *kharif* '92 between the normal petaled white flower as female and the broad petaled blue flower as male.

All the F₁ plants were broad and blue petaled. The F₁s were selfed and seed collected. The F₂

Table 1. Segregation pattern in F₂ and Chi-square test

F ₂	Expected ratio	Observed value	Expected value	Deviation	D ² /E
Broad petal blue	9	190	181.69	+ 8.31	0.3801
Broad petal white	3	57	60.56	- 3.56	0.2093
Normal blue	3	54	60.56	- 6.56	0.7106
Normal white	1	22	20.19	+ 1.81	0.1623
				Total	1.4623

Chi-square probability = 70-50%

generation was raised in *khairf* '93 and the segregation pattern was studied by Chi-square method. The F₁ plants were also test crossed with the normal petaled type with white flowers as female separately and the seeds obtained were also raised in a separate block and the segregation pattern was studied during *khairf* '93.

RESULTS AND DISCUSSION

In the direct cross of normal white x broad petal blue, out of 35 flowers crossed; pod set was obtained in 6 and a total of 30 seeds was collected. Of these, 26 germinated, but 5 turned out to be similar to the female parent and hence rejected as selves. The other 21 F₁ plants had broad petal blue flowers indicating the dominance of blue colour as well as broad petal shape. Of these 21 plants, 15 were selfed and advanced to F₂ and 6 were used for test crosses. From these 15 F₁ plants, 50 pods were collected from which 342 seeds were obtained and advanced to the F₂ generation. In the F₂, only 323 seeds germinated and the segregation pattern obtained is given in Table 1 along with the Chi-square results.

The F₂ results indicated that both the characters *ie.* flower colour and shape of petals are independently assorted with a ratio of 9:3:3:1. The test cross data also confirmed a similar genetic control. When the broad petal Blue F₁ was crossed with Normal white petaled type, out of the 64 flowers crossed a total of 20 pods set and a total of 105 seeds was obtained. Of these, 88 seeds germinated and the segregation pattern is given in Table 2. The normal white types were slightly

Table 2. Test cross segregation pattern and Chi-square test

Type	Observed	Expected on 1:1:1:1 ratio	Deviation	D ² /E
Broad petal blue	17	22	- 5	1.1363
Broad petal white	19	22	- 3	0.4091
Normal blue	22	22	-	--
Normal white	30	22	+ 8	2.9090
			Total	4.4544

Probability = 30-20%

higher than the expected on 1:1:1:1 ratio, but this increase was probably due to a few selfed seeds also from the normal white parent used as female. Based on the segregation pattern, the gene symbols 'W' for blue and 'w' for white and 'N' for broad petals and 'n' for normal petals are proposed.

In *C. ternatea*, the data from direct cross as well as test cross indicated that the genes for flower colour *ie.* blue and white as well as the genes for petal shape *ie.* broad petals and normal petals independently assort, and hence the genes controlling these two characters must be present on different chromosomes. The blue colour of the flower as well as the broad shape of the petals are dominant to white colour and normal petals respectively.

REFERENCES

- SRINIVASAN, V. (1962). Floral abnormalities in *Clitoria ternatea* Linn. *Madras Agric. J.*, 49: 269.

(Received : July 1995 Revised : September 1995)