THE FAT FROM THE SEEDS OF *VANGUERIA SPINOSA* (N.O. RUBIACEÆ)

THE seeds for the investigation were collected from a forest about 30 miles south-west of Kolhapur. The fruit (Mar.: *Alu;* Hindi: *Muduna, Moina*) is globose, smooth and yellowish brown when ripe, and is edible. The seeds are longish and biconvex.

The decorticated seeds were extracted with benzene, in a soxhlet, and the yield was calculated on this basis. The last traces of the solvent were removed by distillation under vacuum, whereupon the fatty oil set to a pale green solid mass.

The physical and chemical constants determined are given below. The details and the subsequent work done will be published elsewhere.

Yield of the fat 38·5 per cent.; Specific gravity at 24° C. 0·9515; Refractive index at 27° C. 1·4780; Acid number 3·98; Saponification value 191·0; Iodine value 88·72; Reichert-Meissel value 1·5; Polenske number 0·46; Acetyl value 5·66; Unsaponifiable matter 0·95 per cent; Melting point of the fat 50° C.

J. W. AIRAN.
S. V. SHAH.

Rajaram College,
Kolhapur,
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PRE-SOWING TREATMENT AND PHASIC DEVELOPMENT

HENCKEL AND KOLOTOVA[1] have suggested a method for inducing resistance to drought by repeatedly drying germinated seed. Although such a treatment increased the growth and yield of wheat plants no evidence was presented by these authors to show any acceleration in the developmental phases of wheat. In the course of work in this Institute on the drought resistance of Indian wheats it has been observed that wheat plants grown from pre-hardened seed reached anthesis earlier than those grown from untreated seed. As this observation has not been recorded so far as it has a vital bearing on the theory of phasic development a brief summary of relevant results is presented here. The details of the method used together with the full data will be published elsewhere. It will suffice here to state that the temperature and the duration of the treatment as well as the process of soaking were modified to suit Indian conditions. The treatment was also different in the case of the pot and the field experiments.

The results of the pot experiment (Table I) as well as of the field experiment (Table II) show an acceleration in the development of nine varieties of Indian wheat which though small is clear. The analysis of variance on the data shows that earliness produced by the pre-sowing treatment is very highly significant (at 1% point) for all the varieties. The highest response is of about six days in four varieties (mean of 24 values). Difference between earliest plants in some cases was, however, found to be more than 10 days. Three other varieties, *viz.*, I.P. 111, I.P. 114, Pb. 8-A did not give statistically significant results in both the experiments and therefore are not included in the tables of results. The growth and yield data which will be presented elsewhere clearly indicate that the pre-sowing treatment had a beneficial effect in all respects.

It would be well to point out here that the total time for which the seeds were kept in the swollen condition (germinated) was in all cases 24 hours. It is probable that by increasing the duration of the treatment a greater acceleration in development may be obtained. Experiments are under way to test this point.

In all the varieties the seeds had burst and the embryos were exposd. In some cases, *e.g.*, in I.P. 165, and Pb. 8-A the radicles had emerged. This fact in no way impaired the germinating capacity of the seed even though three successive desiccations after each soaking were given to the germinating seed. On the contrary the rate of germination, percentage germination, and the seedling growth rate were greatly accelerated in some of the varieties.

Another point worthy of note is that the germinated seed was stored for two months after the final desiccation before sowing.

TABLE I

Pot experiment

Wheat (Triticum vulgare)

Sown on 30-10-1941

Variety	Sowing to Anthesis (Days)		Earliness (C–P) (Days)	Treatment variance	
	Control (untreated) C*	Pre-hardening treatment P*		Error variance $n_1 = 1, n_2 = 46$	
I. P. 4 ..	73·67	67·37	6·00 ± S. E. 1·37	15·30	S
I. P. 112 ..	72·08	69·33	2·75 ± 0·63	15·28	S
I. P. 120 ..	97·67	91·50	6·17 ± 0·67	68·21	S
I. P. 165 ..	73·17	69·25	3·92 ± 0·77	20·87	S
Pb. 9–D ..	105·50	103·29	2·21 ± 0·35	32·33	S
A. T. –38 ..	110·29	104·33	5·96 ± 0·43	145·90	S
C. P. H–47 ..	104·08	98·00	6·08 ± 0·80	46·00	S
Pb. C. 591 ..	100·56	97·58	2·98 ± 0·79	66·48	S

* = mean of 24 values S = significant at 1% point

TABLE II

Field experiment

Wheat (Triticum vulgare)

Sown on 4-11-1941

Variety	Sowing to Anthesis (Days)		Earliness (C–P) (Days)	Treatment variance	
	Control (untreated) C*	Pre-hardening treatment P*		Error variance $n_1 = 1, n_2 = 58$	
I. P. 52 ..	98·43	96·80	1·63 ± S. E. 0·50	10·64	S
I. P. 112 ..	100·06	97·23	2·83 ± 0·63	20·10	S
I. P. 120 ..	105·70	103·00	2·70 ± 0·59	20·60	S
I. P. 165 ..	93·40	89·67	3·73 ± 0·61	37·50	S
Pb. 9–D ..	106·10	102·03	4·07 ± 0·37	122·20	S
A. T.–38 ..	108·00	105·37	2·63 ± 0·54	24·20	S
C. P. H–47 .	107·67	103·17	4·50 ± 1·69	7·09	S
Pb. C. 591 ..	103·73	100·77	2·96 ± 0·45	41·07	S

* = mean of 30 values S = significant at 1% point

In the light of the present findings it may be postulated that there is a separate developmental phase as influenced by desiccation (which may be termed the drought phase).

It also appears that the technique of vernalizing Indian crop plants will have to be considerably modified to obtain results of practical value by combining efforts to induce resistance to drought by pre-sowing treatment and to produce an early crop. Experiments have already been initiated in this Institute to throw more light on this question of agricultural importance.

In conclusion I wish to express my thanks to Rao Bahadur B. Viswa Nath, the Director, and Dr. B. P. Pal, the Imperial Economic Botanist, for providing facilities for work, and for valuable suggestions and criticisms.

J. J. CHINOY.

Botany Section,
Imperial Agricultural Research
Institute, New Delhi,
August 13, 1942.

[1] Imperial Bureau of Plant Genetics, *Bull.*, 1935, 17.

ALBINISM IN SUGARCANE

WHILE surveying the crops grown under sewage irrigation an interesting case of "Albinism" was observed in a local Pounda variety of sugarcane on the Municipal Sewage Farm, Nagpur. A similar case was also observed in Bezon Bagh, Nagpur, where the crop was irrigated with effluent and wet activated sludge. This occurrence was, however, not met with in any other cane field round about Nagpur.

The symptoms are white patches of varying dimensions along the midribs on the lower side of the leaf from the second to the ninth leaf. These patches are from 0·5 to 9·0 cm. in length and are not contiguous. In some cases the intermediate leaves were not affected, while in others all the leaves from the second to the ninth were affected. The patches are slightly raised above the normal surface of the leaf and are bound by a faint yellow margin. Corresponding to the albino areas on the lower surface of the midribs, slight discoloration on the upper surface was also observed which showed itself more prominently when the leaves were held against light. The percentage of affected plants was fairly high, ranging from 20 to 25 per cent.; but no difference in the general development and growth was noticed between the normal and the albino-leaved plants.

Microscopic examination of the affected portions of the leaf did not reveal any difference between the normal and albino parts except that the chlorophyll was observed to have been disorganised in the latter. It was also ascertained that the white patches were not due to any insect, fungal or bacterial infection.

Diseases of sugarcane showing chlorophyll deficiency as recorded by Subramaniam[1] are briefly described below:—

(1) *Sectional Chlorosis*: (Environmental factors—Double effect of cold weather and the presence of water within the leaf culm). Tops of the affected plants show sectional chlorosis.

(2) *Manganese Chlorosis*: (Manganese deficiency in soil solution). Parallel white lines are seen on the leaf-blade due to failing of chlorophyll to develop.

(3) *Dwarf Disease*: (Cause undetermined). Feeble chlorotic shoots commonly arising when infected setts are planted. (Reported only from Australia.)

(4) *Mosaic Disease*: Virus infection.

(5) *Streak Disease*: Virus infection.

From the previous description of the albino patches, it is quite evident that this occurrence is quite different from the diseases so far recorded. It was further interesting to note that these white patches on the midribs were observed only on the crop grown under sewage irrigation and secondly, that the patches were restricted to the lower leaves, new leaves coming after the onset of monsoon being free from them. The monsoon leaves had their normal even green colour. Albinism is generally said to be a hereditary character recessive in its nature. What this albinism is due to is being investigated.