

smooth except for broadly serrated edges on either side of the groove on the inner side of the column). In the F_1 the stylar arms were hairy, more so towards the inner side. The column of the awn was barbed, the concentration of barbs being on the two edges of the columnar groove. The F_2 gave a clear segregation for hairy stylar arms and barbed columns of awn (225) and smooth stylar arms and smooth columns of awn (80). In the F_3 generation, the smooth selection bred true. Of the four hairy selections, one bred pure and the other three segregated giving a total of 516 hairy to 160 smooth. It will thus be seen that this homologous pair went together and proved a monogenic dominant.

The two parents figuring in this cross differed in other characters also and cross-collations between this rare character and other contrasting characters give independent di-hybrid segregations for hairiness of node, yellow colour of grain, the Q factor for leafsheath-glume colour and felty hairs on glumes.

In Sorghum, as in many grasses, the homologous stylar-arms and awn-columns are usually smooth. In rare instances there could be hairy styles, and barbed columns. This condition is heritable and is a monogenic dominant.

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¹ *The Ind. Jour. Agrl. Sci.*, 1936, 6, 1313.

² *The Madras Agrl. Jour.*, 1938, 26, 123.

³ *Curr. Sci.*, 1939, 8, 215.

⁴ *Proc. Ind. Acad. Sci.*, 1939, 10, 249.

⁵ *Curr. Sci.*, 1936, 4, 817.

⁶ *Jour. Ind. Bot. Soc.*, 1936, 15, 139.

Sorghum—Awns of Inconstant Length and Their Inheritance

THE spikelets of sorghum may be awned or awnless. When awned, the awns vary in length. They may be short or long and grade up or down in length. In cultivated sorghums,

awn length is generally delimitable within a variety with a fluctuation of about 2 mm. The tops of the earheads tend to have the longer awns in greater numbers. This is common with the generality of the cultivated sorghums.

An exception to this condition occurs in *Sorghum guineense* Stapf, a group of sorghums from Nigeria in Africa. Most of the varieties in this sorghum have short awns, the commonest length being 3 to 5 mm. Instead of the length fluctuating within sharp limits (with obviously stray shorter and longer ones), there is in this group a regular gradation in awn length starting from small points (looking almost awnless) to awns up to 9 mm. in length. There is thus a manifestation of awn length that is inconstant ranging from 1 to 9 mm. with the bulk of them at 3 to 5 mm. Unlike the other sorghums with well-defined awn length groups, in *S. guineense* the tendency is for awns of longer length to be more towards the base of the panicle instead of at the top. The result of this wide range in awn length and its distribution in the earhead is to give this type of head a checkered look as far as awn length goes, in contrast to the easily recognisable awn groups of other sorghum varieties.

S. coriaceum Snowden, stands for the normal type of awns. Family No. A.S. 4143 is a type belonging to this group, with awns 9 to 11 mm. in length. In this there occurred a natural cross with awns 5 to 7 mm. in length. From the characteristics of the F_1 , and the behaviour of the F_2 and F_3 generations, the pollen parent could easily be traced to the group *S. guineense* Stapf. This F_1 was sown and segregated for awn length giving a range from 1 to 15 mm. The constancy and the inconstancy of the manifestation of awn length was not easy of pursuit in the shorter reaches of awn range—3 mm. and below; but in lengths from 5 mm. and upwards, the constancy and inconstancy of awn length could be judged. There were 126 constant and 41 inconstant manifestations. From this F_2 , selections were taken with a maximum awn length of 9 mm., 4 selections with awns 7 to 9 mm. (constant manifestation)

and 2 with awns 1 to 9 mm. (inconstant manifestation). The 2 latter bred true in the third generation. Of the 4 former one bred pure for 7 to 9 mm. and the 3 others segregated again giving a total of 248 plants with awns of constant length (7-9 mm.) and 82 with awns of inconstant length (1-9 mm.). An analysis of panicles of the inconstant length type shows the following distribution in awn length within the earhead (average of 5 panicles).

9 mm. and below	133
7 mm. „	340
5 mm. „	481
3 mm. „	753
1 mm. „	385

This large representation in every group of awn length, gives the earhead its checkered appearance due to the inconstancy in the length of the awn.

It will thus be seen that in *S. guineense*, Stapf the manifestation of the awn is inconstant in length varying within wide limits and that this type of inconstant awn is a monogenic recessive to the common manifestation of awn length, which is in well-defined and easily classifiable length groups.

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Distillery By-product—Yeast

A BY-PRODUCT in the alcoholic fermentation of molasses, yeast is obtained as a deposit mixed with calcium salts, and is sufficiently rich in nitrogen, phosphate and potash to be used as manure alone or as admixture with compost. The yeast occurs also in suspension in the fermented solution to the extent of 0.75 per cent. by volume, which can be recovered by centrifuging. Together, the yeast takes up 70 per cent. of the nitrogen present in the fermenting liquid; 93 per cent. of the phosphate and 3.2 per cent. of the potash in the molasses are also utilised. Removal of suspended yeast by centrifuging the fermented wash, prior to

distillation, is good practice as it reduces the fouling of distilling plates. The spent wash or slop, then, contains the rest of the salts mainly potash which is recovered conveniently by evaporation.

100 tons of molasses on fermentation, deposit 6 tons of yeast sludge which after washing and settling yield 2 tons of air dried yeast. A proximate analysis of the yeast and the distribution of N, P and K_2O are given in Tables A and B.

TABLE A

	Molasses %	Dry Yeast %	Slops (free from Yeast) %
Nitrogen ..	0.5	8.5	0.05
Phosphate ..	0.2	3.5	0.003
Potash ..	3.5	2.1	0.83

TABLE B

Molasses + Am. Salt	Yeast		Slops
	Deposit	Suspension	
100 + 0.7 tons	2 tons	3.33 tons	91,000 gals.
Nitrogen, 1,434 lbs.	380 lbs.	634 lbs.	420 lbs.
P_2O_5 , 448 lbs.	156 lbs.	262 lbs.	30 lbs.
K_2O , 7,840 lbs.	94 lbs.	157 lbs.	7,589 lbs.

The yeast deposit is generally washed out in distilleries. The recovery of this yeast as a supplementary nitrogenous and phosphatic fertiliser would be worth while.

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On *Corticium album* of Dastur

IN 1938 Dastur observed some orange trees at Burhanpur, the lower parts of which were covered by a *Corticium*. The mycelium was wholly superficial, a few hyphæ filling the crevices formed by the cracking of the bark.