

6. The Veterinary charges are the actual cost of medicine used and coolies engaged in the hospital. The cost works out to Re. 1 per animal per annum.

7. Under Sundries a rough figure, Rs. 2 to 3 per animal per year, has been put. This item consists of the cost of buckets, feed troughs, chains, ropes and miscellaneous articles, leave wages to attendants, extra charges in inoculating animals, etc.

From the statement it will be noticed that :—

(i) The heifers mature earlier than bulls. Kangayams and Ongoles heifers mature at 2½ years while Scindhes take a slightly shorter period.

(ii) Kangayams cost least and the Ongoles most.

(iii) The cost of milk fed to calves forms the heaviest item of expenditure.

From our observations it is clear that the average ryot does not keep accounts systematically and is not sure whether or not his industry really pays. He mainly goes by the market prices and is unable to say if the cost of production is really low enough to make the commodity he sells, pay. If he maintains costings there is little doubt that he will soon realize which department in his industry is paying. So far as cattle breeding is concerned he will find out that animals graded by pure bulls would fetch a better price than those bred by the ' scrub ' bull. He will also find out that there are many items of expenditure like grazing, doctoring, depreciation of animals, etc., which he has not included in the cost of rearing animals. When he works out the cost of rearing animals on the lines detailed above, he will soon find out if his method of rearing pays.

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'NORTHERNS' COTTONS

1.—THEIR HISTORY AND PRESENT POSITION

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A. Topography of the tract and the habitat of types.—Circumvented by the Veligondi Hills—that part of the Eastern Ghats bordering Nellore and the two inland districts of Cuddapah and Kurnool—by the Uppalapad Plateau which is an outspur of the Mysore Tableland in the south-west of the Kurnool District, by several bosses west of the Handri valley in the Pattikonda Taluq, by Tungabhadra in the north till Sangameswaram and the Kistna in continuation after the confluence, lies the 'Northerns' Cottons Tract, rich in long stapled cotton, amongst the indigenous types of the Peninsula. It comprises chiefly Kurnool District excepting a portion of the Pattikonda Taluq, Cuddapah District, and a portion of Anantapur. Nandyal, Kurnool, Proddatur and Tadpatri are the important centres of the tract. According to the Report of the Indian Cotton Committee, 1919, the estimate of area and output of 'Northerns' is 439,000 acres and 65,000 bales (each of 400 lb. of lint) respectively. But groundnut, in its expansion, taking a portion of the extent under cotton and the prohibition of rail-borne cotton from beyond Tarlupadu (on the Guntakal-Bezwada line of the

M.S.M. Ry.) into the tract under the Cotton Transport Act of 1925 have reduced the acreage and output. With 50 lb. of lint as acre-yield (official average for the districts concerned), or at 8 acres for a bale of 400 lb. lint (and allowing a margin for the quantity utilized in hand-spinning), the general output of the three markets of the tract has been for

							Bales
Nandyal	...	...	...	...	...	...	20,000
Kurnool	...	...	...	...	...	...	8,000
Tadpatri	...	...	...	...	...	...	12,000
						Total	40,000

This represents the produce from an area of 320,000 acres as detailed below for the three districts.

						Acres
Kurnool with the exception of Pattikonda Taluq	...	...	...	...	...	200,000
Cuddapah	...	...	...	...	...	57,000
Anantapur (one-third of the total cotton area of the district)	...	...	...	...	...	63,000
					Total	320,000

The hill ranges running more or less parallel from north to south have divided the tract into three distinct valleys between them:—(1) the Gundlakamma or the Cumbum valley between the Veligondis and the Nallamalais, (2) the Kundeir or the Nandyal valley between the Nallamalais and the Yerramalais and (3) the Handri valley beyond the Yerramalais in the west.

The great heights of the Nallamalais and the Yerramalais, on either side of the inner Nandyal valley, causing a larger precipitation of the South-west and the North-east Monsoons are responsible for a heavier rainfall in the inner valley than in either of the extra-situated valleys.

					Average rainfall in inches
Nandyal valley	...	...	...	...	29.91
Cumbum	...	...	...	...	24.91
Handri	...	...	...	...	24.78

The types with distinct habitats are quite in keeping with the rainfall and the soils of the particular valleys. The retentive black soils and the alluvial washes of the Kundeir basin transported from the Yerramalais and the Nallamalais and deposited on the original shales, or shaly argillaceous limestones, along with the heavier rainfall, produce cottons markedly superior in yield, ginning percentage, staple, colour and other qualities to the Red Northern's raised with a relatively lower rainfall in the outer valleys, on 'tuvva' (fine dusty) and 'baraka' (gravelly) soils.

	Yield in lb.		Ginning percentage	Staple length	Colour
	Lint	Kappas			
White Northern's	80	275	27-28	$\frac{3}{8}$ " to 1"	White.
Red Northern's	40	160	24-25	$\frac{1}{8}$ " to $\frac{3}{4}$ "	Brown to red.

The Red Northern's, with the hardy habit acquired through their growth under Nature's inhospitable and uncongenial conditions, present produce of a stronger staple than the 'whites'

Cottons east of the Nallamalais and belonging to the Gundlakamma or Cumbum valley go by the trade name of 'Red Northerns—Tarlupadu or Markapur Red'; those west of the Yerramalais and in the Handri valley go by 'Red Northerns—Veldurty or Kurnool Red'; and those of the Nandyal valley as 'White Northerns'.

It may, however, be noted here that to a small extent, the black soil in the Veldurty or Kurnool region does produce white cotton as well; and the red soils in the Nandyal valley, Red Northerns also.

B. Seed admixture and heterogeneity in population through a large number of types.—'Tella-patti', White Northerns and 'Yerra-patti', Red Northerns, were the two chief types (*G. herbaceum* and *G. Indicum* respectively) prior to the installation of the power-driven roller-gins. While the hand-gin was the only contrivance for the separation of seed and lint, all seed for sowing used to be of the crops grown *in situ* in the tract. Types never changed till twenty-five years back. With the speedy disposal of kappas by the power-driven roller-gins, produce from various localities began to get dumped at the ginneries. This and the rapid transport by rail are largely responsible for the intermingling of types.

Seed admixture has been caused in the following ways:—(1) Natural crossing, (2) The village merchants' system of binding over the ryots, (3) Trading with unfair ends and (4) Import of types foreign to the tract.

(1) Natural Crossing.

'If crossing to the extent of ten per cent per annum were unaccompanied by segregation, we should find the number of vicinists increasing along a logarithmic curve, since some of the crossed strains will be re-crossed in subsequent years.'—Dr. Lawrence Balls. The aim of dealers in a market is to secure 'even running cotton', to use an American phrase. When under environmental influences of season, soil and climate (greater stress being laid on rainfall in climate), the same strain yields produce widely differing in spinning qualities, the harm caused by natural crossing, in the same species need cause no alarm. Fears caused on this account may therefore be dispelled as seen from the following extract from Dr. Balls.

'Some part of the F-1 pollen from an interspecific cross is prepotent over all other pollen; that self-pollen is prepotent over pollen from other species; and that pollen from other species only makes its way to the ovule with difficulty.'

Practically, renewal of seed supplies may be effected when there is a pure source as in the case of the Department for the strains.

(2) The village merchants' system of binding over the ryots.

In the tract, giving 5 'dadiams' (or 33 lb.) of seed for sowing purposes and taking in return one maund (26½ lb.) of seed-cotton at picking time is the rule. All the petty merchants who feed the dealers of firms, carry on their trade with ryots of mediocre or poor status in this way (*jatti* system, as it is called). The merchant is a great obstacle to carry out any reform, as the *jatties* and other prior debts contracted by

the ryot for cultivation expenses, always keep the latter a slave to the former. The petty merchant purchases cotton from a legion of such clients, from coolies that receive their picking wage in kind and from various other sources. The seed after ginning such stock goes into lots intended for distribution for sowing purposes.

(3) Trading with unfair ends.

Intermingling of types has been brought about in a large measure through the medium of the merchant-buyers who purchase the produce as kappas from the cultivators and deliver to the Firms as lint. The *Vaisya* merchant is largely competed by the *Lingayat* and the cultivating *Reddi*. Cultivating ryots of the *Reddi* community with huge landed areas—generally the principal or biggest ryots in the village, are figuring prominently in the cotton trade. They are the main buyers of produce and the suppliers of seed for sowing in their own and adjoining villages. Some of them possess their own ginneries or hold shares in ginneries built under Joint Stock Companies; others are, still further, feeders to brokers, or firm-brokers themselves. It may be imagined how such a connecting chain along with the *jatti* system would keep the cotton culture controlled by the cotton trade.

Though mention is made in the contracts, by the sellers to Firms, as delivery by type (e.g., White Northern, Tarlupadu Red, etc.), yet the delivery practically is more according to the sample of definite 'class' (staple, colour and refraction or mechanical impurities), brought about by a skilled admixture of kappas of several types before the ginning.

Profits are realized by mixing inferior cottons with the locals and passing the same as genuine cotton. To deliver Good White Northern under a contract, a merchant purchases kappas of white, Red and Cambodia in the proportion of 7 : 2 : 1; or, White, Mungari and Cambodia in 8 : 1 : 1. The kappas for mixing are put in layer by layer. Red Northern give the additional strength needed in the mixture and Cambodia the whiteness. The resulting seed of the mixture when disposed of for sowings brings in the heterogeneous population. Mixtures in other proportions and with other varieties are also practised when the agent of the firm and the seller resort to underhand dealings.

Prior to the enforcement of the Cotton Transport Act of 1925, extra-tractial produce for illegal trade profits used to be largely imported. A large quantity of the cheap inferior Cocanadas from Guntur side used to be got for wilful admixture with the local cotton for delivery under 'Northern'. So vigorous was the import into Nandyal of this exotic stuff, that since its prohibition under the Act, the output of the Nandyal Market has gone down by nearly 50 per cent. Since 1926, the presence of the *G. obtusifolium* (Cocanadas) plants in the White Northern's fields is greatly minimised. Kappas however are now got under license from Tarlupad.

(4) Import of the types foreign to the tract.

Under this head special mention may be made of (a) 'Coomptahs' and (b) the *Neglectum* types.

With the merchant's interest in securing as high a percentage of lint as possible from the kappas he purchases and the ryot's ambition to procure as high a yield as he can under the dry-farming conditions, experiments were ever going on with trial of the exotic types: And whether or not these objects were to be achieved without sacrificing the qualities desired for spinning, was not the main consideration.

The original 'White Northerns' of the tract had black, non-fuzzy, naked seed and the type was giving only a ginning percentage of 25. One of those that gained ground in the Nandyal valley is what is popularly known as 'Gadag' seed. It is cotton seed (*G. herbaceum*) imported from the Coomptah tract from the Districts of Bijapur, Dharwar and Gadag of Bombay Presidency. Gadag, Mallapur, Annigeri, Bagalkot, Alur, Bijapur, Hubli and Kopbal are the chief centres from which the seed is exported by rail from the said districts. Nandyal and Panyam obtain the largest supplies (over 20,000 bags of 130 lb. each in 1929-30), Kurnool and Tadpatri figuring next to them. From Nandyal, seed is taken to Sirvel and Nandyal Taluqs, Atmakur Sub-division of Nandikotkur Taluq and portion of Koilkuntla Taluq. From Panyam, the seed goes to Banganapalle State and Nandyal Taluq. From Tadpatri, to Owk sub-division of Koilkuntla Taluq: and from Kurnool to portions of Kurnool and Nandikotkur Taluqs. Thus stocks continue to be largely imported into the Nandyal tract for nearly a score of years. With a higher ginning percentage of 27 to 28 and a better drought-resistant quality than the original 'White Northerns', this 'Gadag' had ousted the former to the verge of extinction. The original 'White Northerns' of black, non-fuzzy seed now figure only as stray seeds in other types; and the present 'White Northerns' are mainly acclimatised 'Coomptahs'.

As far back as 1917, the Indian Cotton Committee observed the spread of *G. neglectum-roseum* around Adoni. It gradually spread into Pattikonda Taluq, to parts of Kurnool and Dronachellam Taluqs and to stray places in Nandyal Taluq. It suits the 'Mungari' or early crop season, is a good yielder (500 lb. seed cotton), has a high ginning percentage (30 to 33), but possesses a weak and short staple ($\frac{1}{2}$ "). In the markets of the tract, it is not delivered by itself on contracts, for want of demand. It mainly goes in as an adulterant in Red Northerns and to a small extent in White Northerns. This type is also known as 'Gospatti' (*G. neglectum-roseum* and *G. neglectum-verum*). Its spread is restricted on account of the poor price it fetches, when compared to others. A waggon-load of seed is reported to have been got to Kurnool from Akola this year.

C. Past and Present Types.—

TABLE I

Past Types

Trade name	Local name	Botanical species	Remarks
Red Northerns ...	<i>Yerra-patti</i>	<i>G. Indicum</i>	...
White Northerns ...	<i>Tella-patti</i>	<i>G. herbaceum</i>	Non-fuzzy, black seed.

TABLE II
Present Types

Present types of the tract	Chief constituent and adulterants	Local name	Botanical species	Trade type	Average approximate percentage based on observation	
					Prior to C. T. Act of 1925	Present day
RED NORTHERNS ...	Chief constituent. Adulterants figuring as rogues.	'Yerra-patti. Masara-patti or Guntur-patti Gospatti. Do.	<i>G. Indicum</i> , <i>G. obtusifolium</i> , Do. <i>G. neglectum-roseum</i> <i>G. neglectum-verum</i>	Red Northern. 'Cocanadas-Red' (Guntur). Do. 'White' (Warangal) } 'Mungari'	60	90
					29	5
					1	...
					10	5
					100	100
WHITE NORTHERNS.	Chief constituent. Adulterants figuring as rogues.	'Gadag-patti. Tella-patti. Masara-patti or Guntur-patti Gospatti. Do. Jawari. Sircar No. 2. Sircar No. 14. Pedda-patti	<i>G. herbaceum</i> , Do. <i>G. obtusifolium</i> , Do. <i>G. neglectum-roseum</i> <i>G. neglectum-verum</i> <i>G. herbaceum</i> , Do. <i>G. Indicum</i> , <i>G. hirsutum</i> , Do.	'Coomptah', ¹ Original Nandyal white. 'Cocanadas-Red' (Guntur). Do. 'White' (Warangal) } 'Mungari', 'Western' (Bellary). 'Agriculture', 'Farm', Cambodia. Dharwar-American. ²	70	90
					3	1
					14	1
					trace	...
					5	4
					3	1
					2	trace
					1	2
					1	1
					1	1
					100	100

¹ When freshly imported, Gadag seed is sown, the proportion is 99 Coomptah and 1 Dharwar-American.

² Green Dharwar-American seeds are always found in imported bags of Gadag seed.