

Crop Adjustments to Raise Agricultural Production

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In the context of planning for higher agricultural production, it is relevant to enquire how far the cultivated area in the country is under the most suitable cropping systems, and, further, to explore possibilities of raising agricultural production through crop adjustments.

The author presents the results of a study aimed at examining the localisation of crops with a view to assessing how far the cropping systems are adjusted to the primary factors in agricultural production: quality of the soil and climatic conditions. On the basis of the analysis of existing crop systems, it is intended to see whether, and to what extent, production can be increased through crop planning or crop adjustments?.

[This article is an extract from a study "Land Utilisation and Cropping Pattern" by the Institute of Social Sciences, Agra, to be published shortly.]

THIS study relates to U P which has over 50 million acres of cultivated land. It covers eight major crops: paddy, wheat, bajra, jowar, maize, gram, barley and sugarcane, which account for 78.15 per cent of the total cultivated area, and are fairly representative of the important crop groups in the State. The data is taken from the "Season and Crop Reports for U P", published annually by the U P Government. The extent of cultivation of different crops and their average yields have been calculated by averaging the respective data for the five years, 1953-54 to 1957-58. The district is taken as the basic area unit.

In the first stage, data for the eight crops for 4M districts (excluding four hill districts for which the necessary information was not available) was averaged over the five years, and eight consolidated tallies, one for each crop, were prepared, showing the extent of cultivation as per cent of total cultivated area and average yields and standard yields in maunds per acre.

Correlations were then worked out between the extent of cultivation and the yield for the eight crops separately (see Table 1). Further, because of the large variation both in the extent of cultivation and the yield of different crops from one district to another, for each crop the 48 districts were classified into five groups on the basis of the degree of variation in the extent of cultivation and yields. Variation was measured from the State average, and the following classification was evolved:

Group	Extent of variation (%)
A	Above + 15
B	+ 5 to + 15
C	+ 5
D	-5 to -15
E	Below -15

On the basis of this classification, the extent of adjustment in the case of each crop was analysed. To determine the extent of adjustment, the following procedure was adopted:

	Extent of cultivation				
	A	B	C	D	E
Yield	AA	BA	CA	DA	EA
	AB	BB	CB	DB	EB
	AC	BC	CC	DC	EC
	AD	BD	CD	DD	ED
	AE	BE	CE	DE	EE

By applying this formula, the following five adjustment categories were determined:

Adjustment categories	Groups in each category
I Well adjusted	AA, BB, CC, DD, EE
II Sufficiently adjusted	AB, BC, CD, DE BA, CB, DC, ED
III Tolerably adjusted (Having some degrees of maladjustment)	AC, BD, CE CA, DB, EC
IV Maladjusted	AD, BE, DA, EB
V Highly maladjusted	AE, EA

The adjustment category of each district was determined on the basis of the above classification for each crop separately. This was done on the basis of the adjustment of extent of cultivation to both average yields and standard yields. The extent of area under each adjustment category was calculated for all the eight crops separately (see Table 2), and then to summarise the findings, the results obtained in respect of the eight crops were combined (see Table 3). Finally, to obtain a broad picture of the extent of adjustment

and maladjustment in the case of different crops, the five adjustment categories were reduced to two broad classes, showing respectively, the extent of adjustment and maladjustment (see Table 4).

Some broad conclusions which may be derived from the data presented in the Tables may now be summarised. First, there does not appear to be much difference between the results arrived at by taking the average yield as the basis and those reached by taking the standard yield as the basis. Second, the cropping system shows a very great extent of maladjustment, indicating a large-scale misuse or improper use of the cultivated area. Roughly 1/3 or about 30 per cent of the cultivated area is being used to grow unsuitable crops. From this it is estimated that with the existing level of technology it is possible to increase agricultural production significantly if the necessary crop adjustments are made.

The degree of maladjustment is, of course, different for different crops. Amongst the crops studied, it was found to be maximum in the case of paddy which is the most common staple crop in the State; it was least in the case of sugarcane which is the most important commercial crop. Further, maladjustment was greater in *kharif* (summer) crops than in *rabi* (winter) crops, and, on the whole, much less in the case of crops cultivated mainly for the market. Winter crops, as a group are more commercialised compared to summer crops. Thus, it appears that greater the degree of subsistence farming, greater the extent of maladjustment of crops and greater the misuse of land.

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The conclusions that emerge from our study for U P are perhaps broadly true for the country as a whole. It is estimated that in the country as a whole at the present level of techniques, an increase of 12 to 15 per cent in agricultural production and of about 10 to 12 million tons in food production is possible by correcting the maladjustments in cropping patterns. Such correction of maladjustment may require expansion or reduction of area under specific crops in different parts of the country. It may even mean cessation of cultivation of some crops by some farmers and in some regions. In sum, it is bound to be a change towards lesser diversity and

greater specialisation. In all cases, it involves a change from conventional cropping systems. It involves questions of the basic motives governing the pattern of farm production and of the incentives which will

induce farmers to change to new patterns. The necessary adjustments will also depend on certain other considerations i.e. the organisational and institutional framework of agriculture, the resources available to

Table 1

Crop	Correlation between extent of cultivation and average yield	
	Based on average yield	Based on standard yield
Paddy	+ .263	+ .059
Wheat	+ .130	+ .093
Bajra	+ .146	+ .154
Jawar	+ .373	+ .061
Maize	+ .157	+ .606
Gram	+ .385	+ .273
Barley	+ .319	+ .390
Sugarcane	+ .639	+ .697

Table 3

Adjustment categories	Based on average yield		Based on standard yield	
	Area (million acres)	% of total	Area (million acres)	% of total
Well adjusted	7.6	19.3	5.0	12.8
Sufficiently adjusted	10.2	26.0	11.8	28.8
Tolerably adjusted	9.2	23.5	11.3	28.8
Maladjusted	6.8	17.4	7.1	18.1
Highly maladjusted	5.4	13.8	4.5	11.5
Total for U P	39.2	100.0	39.2	100.0

Table 4

Crops	Extent of Adjusted Area		Extent of Maladjusted Area	
	Based on average yield	Based on standard yield	Based on average yield	Based on standard yield
	Paddy	53.5	56.5	46.5
Wheat	72.9	68.7	27.1	31.3
Bajra	64.1	72.8	35.9	27.2
Jawar	62.5	75.3	37.5	24.7
Maize	64.4	70.4	35.6	29.6
Gram	78.1	79.5	21.9	20.5
Barley	74.3	67.5	25.7	32.5
Sugarcane	89.2	98.6	10.8	1.4
All crops	68.8	70.1	31.2	29.6

Table 2

Crops		Well adjusted		Sufficiently adjusted		Tolerably adjusted		Maladjusted		Highly maladjusted	
		Area ('000 acres)	%	Area ('000 acres)	%	Area ('000 acres)	%	Area ('000 acres)	%	Area ('000 acres)	%
		Paddy	A	1207	13.5	531	6.0	3028	34.0	2107	23.6
	B	313	3.5	2455	27.5	2270	25.5	2026	22.7	1850	20.8
Wheat	A	828	9.1	3672	40.4	2110	23.3	2174	24.0	290	3.2
	B	976	10.8	2193	24.1	3070	33.8	2294	25.3	547	6.0
Bajra	A	774	28.0	469	16.9	531	19.2	355	12.8	640	23.1
	B	402	14.5	736	26.6	879	31.7	47	1.7	705	25.5
Jawar	A	1123	49.7	193	8.5	96	4.3	390	17.3	455	20.2
	B	552	24.5	527	23.3	621	27.5	134	5.9	423	18.8
Maize	A	1012	40.3	412	16.4	193	7.7	117	4.7	776	30.9
	B	439	17.5	693	27.6	635	25.3	413	16.4	331	13.2
Gram	A	1423	22.0	1813	28.0	1819	28.1	1006	15.5	412	6.4
	B	1079	16.7	2289	35.3	1778	27.5	1327	20.5	—	—
Barley	A	692	15.0	1951	42.4	775	16.9	390	8.5	792	17.2
	B	992	21.6	1154	25.1	958	20.8	836	18.2	560	14.3
Sugarcane	A	499	19.1	1162	44.4	673	25.7	282	10.8	—	—
	B	275	10.5	1235	47.2	1069	40.9	37	1.1	—	—

A = Based on average yield
B = Based on standard yield

the farmer and the progress of general economic development in the district or locality concerned. The speed at which existing maladjustment in the cropping systems can be corrected will depend on all these factors. For that reason, no drastic change can be brought about overnight in the cropping patterns. Crop adjustment is essentially a long-term measure and should be taken up as such.

Scarcity of land and capital im-

pose severe limitations on Indian agriculture. Under such circumstances, misuse or unwise use of available land is intolerable and any measure seeking to increase agricultural production without involving the use of scarce resources is particularly welcome. We consider crop adjustment to be one such measure, and hence of special significance.

Besides, as long as the cropping pattern is maladjusted, investment in

other directions calculated to increase agricultural production, cannot yield the maximum benefit. Under an unsuitable cropping pattern, not only is the existing misuse of resources perpetuated but fresh investment will likewise be largely wasted. The introduction of the Japanese method of paddy cultivation in areas which are not at all suitable for rice cultivation is one illustration of such waste.

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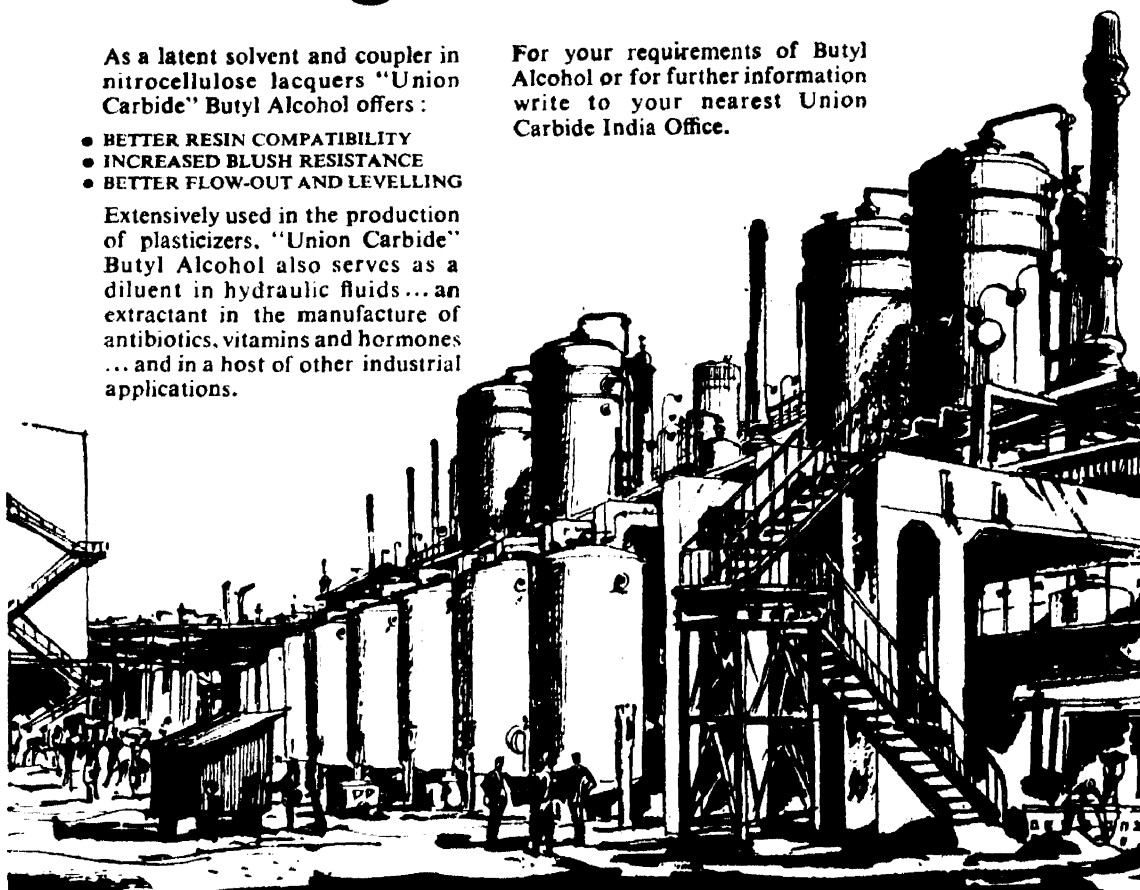
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