

THE EFFECT OF THE CULTIVATION OF BRASSICAE OIL-SEED CROPS ON THE SOIL FERTILITY

OIL-SEED crops occupy about 25 million acres annually in India (undivided) and the principal crops are groundnuts, linseed, brassicæ (mustard group), sesamum and castor. The groundnut and castor crops are practically confined to peninsular India, linseed is spread over the peninsular India and the Indo-Gangetic plain while brassicæ crops consisting of *torio*, *sarson* and *rai* are chiefly grown in the Indo-Gangetic alluvium with annual area of about 5.5 million acres. Sind, the fertile valley of the river Indus, has increased considerably the cropping area

perience and results of the crop sequence experiments.

The experiments comprised of three sets. In each set the basic crops, *viz.*, *torio*, *sarson* and wheat with fallow as the control were grown during the *rabi* season. Cotton, Jowar and wheat were grown on the same area in different sets as succeeding crops to gauge the exhausting effect of the previous crops on the soil during the year. Each set was a complete experiment laid out according to randomized block system with five replications, the ultimate size of the unit bed being 1/50th of an acre. The experiment was conducted for two years. The results are presented in the following table.

Succeeding crop Basic crop		Mean yield per acre in lbs.					
		Cotton (M4)		Jowar (Soaro Kartuho)		Wheat (At 38)	
		1944-45	1945-46	1944-45	1945-46	1944-45	1945-46
A— <i>Torio</i>	..	1014	868	451	819	1221	1896
B— <i>Sarson</i>	..	1054	852	472	778	1346	1854
C—Wheat	..	768	675	335	560	1320	1620
D—Fallow	..	1580	1149	362	923	1554	1748
F value	..	12.96†	3.49*	2.47	2.70	.81	3.4
Conclusions D > A = B = C		D > A = B = C	

* Exceeds the 5% level of significance.

† Exceeds the 1% level of significance.

after the advent of the canal system which made the water available perennially. The substantial increase in area was expected to be under *rabi* cropping. The main *rabi* crops in Sind are wheat and the brassicæ oil-seeds, besides gram and *lathyrus* which are either grown as second crop after rice or in the *katcha* lands (river inundation tracts). These brassicæ oil seed crops having a wide range of sowing form an important factor for the full and economic utilisation of the water under the irrigated conditions. The increase in area under these brassicæ crops has not been substantial mainly due to the general belief among the cultivators throughout India, though not substantiated, that the oil-yielding crops are heavy feeders and exhaust the soil, adversely affecting the yield of the succeeding crop. Hence these crops are not usually included in the regular crop rotations. This greatly handicaps any attempt to increase the area under these oil-seed crops.

With a view to ascertaining the effect of cultivation of these oil-seed crops on the yield of the following crops, a series of field experiments were laid out at Dokri (Sind) during the years 1944-46. The data obtained from these experiments not only indicate the influence of the cultivation of oil-seed crops on the yield of the succeeding crop as compared with wheat but also furnishes the data for fixing the suitable rotation for the irrigated areas as the rotations are generally based upon the accumulated ex-

From the above table it is evident that the yields of crops following the fallow are the highest and those after wheat are the lowest. However, the yield differences in case of jowar and wheat crops were not found to be statistically significant during both the seasons indicating that the growing of *torio* or *sarson* crop has no adverse effect on the yield of the subsequent crops. Another interesting fact is noticed that for shallow rooted crop like jowar or wheat previous fallow is not necessary. However in case of wheat crop the plots were lying fallow during the intervening *Kharif* season. In the case of cotton crop the yield differences were found to be statistically significant during both the seasons. It is evident that yield of cotton following the fallow is significantly higher while the yield differences between other treatments are not statistically significant. Thus the cultivation of oil-seeds in the previous season has no adverse effect on the yield of cotton as compared with wheat. It is however clear that cotton following fallow gives better response.

The above results conclusively prove that the brassicæ oil-seed crops have no adverse effect on the yield of succeeding crops and could be well included into a regular crop rotation.

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December 12, 1947.

Received September 9, 1948,