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APPLE AND PEAR PRODUCTION COSTS IN THE BATLOW DISTRICT FOR THE 1944-45 SEASON.

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Primary producers throughout the world have always agitated for a price for their products sufficient to cover costs of production and to allow them a margin of profit.

Actually, costs incurred in producing any crop in any year have little influence on the price at which the crop is marketed. Nevertheless, the cost-price relationship does affect the future expansion or contraction of production of the commodity in that farmers will tend to shift to production of the commodity which has the most favourable cost-price relation.

There are three main types of costs: historical costs, adequate-income costs, and necessary costs. Each is used to serve a particular purpose. The historical unit cost of production figure is probably the most widely applied, and is the one used in the Batlow apple and pear production cost investigation. Historical costs are based on prices actually paid or prevailing for labour, materials, power and land used in the production of the commodity.

This particular type of cost study is useful in an analysis of the relation of normal costs to normal prices and of increasing and decreasing costs with volume of output. It serves a useful purpose too in the comparison of relative efficiency in the use of the various factors of production by individual farmers, and of profit per unit under the existing combination of these factors.

History of the Batlow Project.

At a conference of the Apple and Pear Growers' Association in 1943 a resolution was passed to the effect that the New South Wales Department of Agriculture be requested to attempt to obtain production cost figures for apples and pears in the Batlow district. As a result, the Economics Division of the Department undertook to design books suitable for the recording of full details of farm activities on individual farms, to supervise the accounting of the records, and to analyse them on return to the Department. Ten farmers in the district agreed to keep these records, and a start was made at the beginning of the 1944-45 financial year. Nine sets of records were returned for analysis at the end of the year.

Contribution of the Batlow District to the State's Production of Apples and Pears.

An idea of the contribution of the Batlow district to the total production of New South Wales may be obtained by comparison of the average production figures for the Tumut Shire and for the whole of the State. (Practically all apples and pears produced in the Tumut Shire are grown in the Batlow district.) The average annual production of apples for the years 1941-46 in the Tumut Shire was 166,325 bushels. The total New South Wales average for the same years was 812,034 bushels. Average annual production of pears 1941-46 was 93,581 bushels in the Tumut Shire and 286,164 bushels for the whole of New South Wales.

Type of Records Used.

As had been indicated, complete costs of all inputs based on actual payments made were collected for each farm. Provision was made in the books for the recording of all details of cash receipts and expenditure, of production of fruit and other crops, of materials used for each enterprise, and of inventories of farm buildings, improvements and machinery, of the bearing orchard and the non-bearing orchard, and of stocks of farm requisites. In addition, record blanks were provided for the daily recording of labour, both hired and family, used in each enterprise. Officers from the Department visited the farmers several times during the year and assisted any who had met difficulties in the accounting. At the end of the financial year the records were checked as far as possible and returned to the Department.

Criticism of the Method Used.

Accurate determination of costs is extremely difficult where more than one commodity is produced on the farm. Under such conditions, many costs must be separated on a purely arbitrary basis, so that any costing method is subject to certain criticism. In this method, the emphasis is on accuracy of detail. The aim is to obtain actual details of quantities, hence costs, of every item which is involved in the production of each commodity. Thus, assuming the records are kept efficiently, details of materials such as sprays, fertiliser, of labour, and of field power actually used for each enterprise may be obtained. There are, however, a considerable number of payments which are not chargeable specifically against any particular enterprise. Such payments include general farm expenses, *e.g.*, telephone expenses, cartage of materials to the farm, rent, insurance and rate payments, and maintenance of machinery and improvements. In the case of labour costs, too, there are numerous farm operations which cannot be charged directly to any enterprise, such as miscellaneous farm work, general ploughing and cultivating, maintenance of machinery and improvements.

These costs are often quite considerable, so that in arbitrarily allotting a value to each enterprise a certain degree of error is introduced. The position is similar for those costs which, although not actual payments made each year by the farmer, nevertheless are justifiably charged against the farm enterprises. These costs include interest and depreciation on land, machinery and improvements. Thus, although the method appears superficially to provide an accurate means of separating costs of individual enterprises, an appreciable part of the analysis depends on arbitrary assessments.

Another criticism of the method arises from the fact that, as a result of the large amount of time and labour involved in analysing these detailed records, the sample used must necessarily be small. It may be argued that the detailed nature of the records more than compensates for the inadequacy of the sample. It is felt, however, that results more representative of the true position as a whole would be obtained by collecting less detailed information from a larger sample of orchards in the district.

In addition, it is desirable that the survey extend over several years to show the extent of variation of costs and returns under different seasonal conditions. Of the nine farmers who kept records during 1944-45 at Batlow six continued during 1945-46, after which the scheme was abandoned.

Types of Farms Keeping Records.

The size of farm and degree of diversification of the nine farms studied varied considerably. In almost every case, vegetables such as potatoes, carrots, tomatoes were produced in combination with fruit. On one farm a large nursery was being developed in conjunction with extensive orchard and vegetable enterprises. However, in all cases receipts from sale of fruit constituted the greater part of total receipts. An idea of the actual size of the orchards may be obtained from figures of bearing and non-bearing trees for each orchard (Table I).

TABLE I.

Numbers of Bearing and Non-bearing Apples and Pears on Nine Orchards at Batlow.

Farm.		1	2	3	4	5	6	7	8	9
Apples	No. Bearing Trees...	2078	2188	3061	1195	1188	777	789	444	187
	No. Non-Bearing Trees ...	—	1217	1800	668	357	123	249	362	85
Pears	No. Bearing Trees...	4534	3117	500	937	811	518	226	166	107
	No. Non-Bearing Trees ...	—	50	1470	—	460	61	2	73	35

In all tables the farms have been numbered from 1 to 9 in decreasing order of the number of bearing apple and pear trees.

Basis of Separation of Costs for Bearing and Non-Bearing Trees.

As far as possible, costs for bearing and non-bearing trees have been separated. For example, it has been assumed that such cultural practices as ploughing and cultivating of the orchard are chargeable to the bearing and non-bearing portions of the orchard according to the proportion of bearing and non-bearing trees to total trees. In the case of spraying, it has been assumed that all materials and labour used in that operation are chargeable to the bearing orchard only. Such items as packing the fruit, cartage of it on the farm, and case-making, have been charged entirely against the bearing orchard.

Separate records of apple and pear costs were kept, but in the many instances where the costs were joint ones the percentage bearing apples and percentage bearing pears of total bearing trees were used as a basis for separation.

Production Costs Obtained from Records of Nine Farms.

By the use of the method outlined above, estimates of total costs of producing apples and pears, up to the stage of packing and marketing the fruit, were obtained. It is pointed out that marketing costs have not been included in any of the estimates of costs presented here.

TABLE II—APPLES.

Labour Cost of Growing and Harvesting Apples on 9 Farms at Batlow (shillings)—1944–45.

Farm.	1		2		3		4		5		6		7		8		9	
	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.
Pre-harvesting	0·90	0·47	2·32	13·97	2·01	2·30	1·26	8·00	2·20	0·76	4·28	1·77	0·92	1·03	2·60	1·27	2·61	4·56
Harvesting	4·74	2·48	0·37	2·23	1·21	1·39	0·27	1·72	2·00	0·69	2·25	0·97	0·75	0·83	...	...	1·76	3·07
General—																		
Total Maintenance Machinery and Improvements	0·63	0·34	0·37	2·27	0·16	0·18	0·30	1·86	0·23	0·08	0·24	0·10	0·22	0·24	0·11	0·05	0·61	1·06
General Orchard Labour	0·01	0·01	0·95	5·74	0·10	0·11	...	...	0·09	0·03	0·30	0·12	0·16	0·18	0·10	0·05	0·04	0·08
Misc. General Labour ...	1·17	0·61	1·11	6·70	0·55	0·63	0·35	2·19	1·09	0·37	2·80	1·16	1·04	1·15	2·34	1·14	2·68	4·68
Total Labour Cost ...	7·45	3·91	5·12	30·90	4·03	4·61	2·18	13·77	5·61	1·93	9·87	4·12	3·09	3·43	5·15	2·51	7·70	13·45

TABLE IIA—PEARS.

Labour Cost of Growing and Harvesting Pears on 9 Farms at Batlow (shillings)—1944–45.

Farm.	1		2		3		4		5		6		7		8		9	
	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.
Pre-harvesting	2·19	0·96	3·86	2·41	2·05	0·38	2·14	1·77	3·34	1·20	4·45	1·04	1·64	0·62	3·07	3·57	2·06	2·56
Harvesting	4·54	1·97	2·15	1·34	5·93	1·12	1·57	1·30	3·26	1·17	4·56	1·07	1·95	0·65	1·22	1·41	1·22	1·52
General—																		
Total Maintenance Machinery and Improvements	0·63	0·27	0·37	0·25	0·19	0·03	0·34	0·28	0·24	0·09	0·29	0·07	0·22	0·09	0·11	0·13	0·63	0·78
General Orchard Labour	0·01	0·01	0·96	0·60	0·93	0·17	...	...	0·09	0·03	0·34	0·08	0·16	0·06	0·10	0·12	0·10	0·12
Misc. General Labour ...	1·38	0·60	2·50	1·56	0·61	0·11	0·89	0·73	1·33	0·48	4·38	1·03	1·79	0·68	2·44	2·83	2·68	3·34
Total Labour Cost ...	8·75	3·81	9·84	6·16	9·71	1·81	4·94	4·08	8·26	2·97	14·02	3·28	5·76	2·10	6·94	8·06	6·69	8·32

In arriving at a figure for total costs the total cost of labour, field power, materials and miscellaneous charges have been calculated separately. As a basis for comparison of the nine sets of results, the cost in each case has been expressed in shillings per bearing tree and per packed case.

Labour Costs.

Tables II and IIA show labour costs of growing and harvesting apples and pears respectively on each of the nine farms. Estimates of labour costs were based on daily records of the number of hours of the labour of each employee or member of the family spent on each enterprise on the farm. The total number of hours spent on each farm operation for the year was multiplied by the hourly wage rate to give the cost of each operation for each unit of labour for the year. The value of the operator's labour, based on an arbitrary allowance of £312 per annum, has been included. Thus the total cost for the year of each farming operation was obtained. Farm activities have been summarised under three main headings; pre-harvesting, harvesting and general. Pre-harvesting operations consisted mainly of spraying, pruning and cultivating the orchard. Picking comprised the main part of total harvesting operations, cartage on the farm and from the farm to the packing house being important items, too, in several cases. Under this heading, too, has been included labour used for case-making. General farm labour covers such items as maintenance of machinery and buildings, general ploughing and cultivating, chaffcutting, pest and weed eradication, wood supplies, holidays, cartage of supplies, business trips to town, management, and other miscellaneous activities.

The cost of labour per bearing apple tree on the nine farms ranged from 2.18 shillings to 9.87 shillings, the average cost being 5.6 shillings. For pears, the range was from 4.94 to 14.02 shillings per bearing tree. For all farms except No. 9 the labour costs for pears was higher than for apples.

The range of costs on a packed case basis was much wider (1.93 to 30.9 shillings) due to the wide differences in yield per tree between the farms. On the whole, the season (1944-45) was a bad one. Yield of packed cases of apples per bearing tree exceeded 2 bushels on two farms only, No. 5 and No. 6. Consequently, costs on a packed case basis were fairly high. Yield of pears per bearing tree on all farms exceeded the yield of apples on all farms, but even so the highest yield was 5.39 cases on farm No. 3. The range of costs for pears was not nearly as wide as in the case of apples, the lowest being 1.81 shillings and the highest 8.32 shillings per packed case.

Field Power Costs.

Tables III and IIIA show costs of the use of field power units (spray, tractor, truck, and horses) for the various farm operations. Records were kept daily of the number of hours these units were used for each enterprise. A total cost per hour figure was obtained for each by calculating the total annual cost and dividing this figure by the number of hours which it was used during

TABLE III—APPLES.

Field Power Costs of Growing and Harvesting Apples on 9 Farms at Batlow (shillings)—1944–45.

Farm.	1		2		3		4		5		6		7		8		9	
	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost packed case.
Pre-harvesting—																		
Spray	0·39	0·21	0·25	1·47	0·14	0·16	0·43	2·72	0·30	0·10	0·66	0·27	0·33	0·37	0·34	0·17	0·51	0·90
Tractor	0·58	0·30	...	...	0·13	0·15	...	...	...	...	...	...	...	...	...	...	...	...
Horses	0·27	0·14	0·27	1·63	0·27	0·31	0·37	2·31	0·47	0·16	0·56	0·23	0·22	0·24	1.00	0·49	0·13	0·22
Total Pre-harvesting ...	1·24	0·65	0·52	3·10	0·54	0·62	0·80	5·03	0·77	0·26	1·22	0·50	0·55	0·61	1·34	0·66	0·64	1·12
Harvesting—																		
Truck	0·26	0·13	...	...	0·20	0·23	...	...	...	...	...	...	0·29	0·33	...	...	1·17	2·04
Horses	0·26	0·13	0·06	0·39	0·03	0·04	0·03	0·22	...	...	0·14	0·06	...	...	1·08	0·53	...	...
Total Harvesting	0·52	0·26	0·06	0·39	0·23	0·27	0·03	0·22	...	...	0·14	0·06	0·29	0·33	1·08	0·53	1·17	2·04
General—																		
Spray	.....	...	...	...	...	...	...	0·01	...	...	...	...	...	...	0·05	0·02	...	...
Truck	...	...	0·38	2·26	0·10	0·11	0·05	0·29	1·26	0·44	...	...	0·14	0·15	...	...	...	...
Tractor	...	...	0·79	4·76	0·04	0·05	...	...	0·02	0·01	...	...	...	...	...	...	...	...
Horses	0·07	0·04	0·06	0·37	0·02	0·02	0·02	0·12	0·01	...	0·04	0·62	0·04	0·04	0·41	0·20	0·13	0·23
Total General	0·07	0·04	1·23	7·39	0·16	0·18	0·07	0·42	1·29	0·45	0·04	0·02	0·18	0·19	0·46	0·22	0·13	0·23
Grand Total	1·83	0·95	1·81	10·88	0·93	1·07	0·90	5·67	2·06	0·71	1·40	0·58	1·02	1·13	2·88	1·41	1·94	3·39

TABLE IIIA—PEARS.

Field Power Costs of Growing and Harvesting Pears on 9 Farms at Batlow (shillings)—1944-45.

Farm.	1		2		3		4		5		6		7		8		9	
	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.
Pre-harvesting—																		
Spray	0·39	0·17	0·24	0·15	0·29	0·05	0·43	0·35	0·30	0·11	0·67	0·15	0·69	0·26	0·88	1·02	0·46	0·57
Truck	...	...	...	...	0·95	0·18	...	...	...	...	...	...	...	...	...	...	...	...
Tractor	...	...	...	...	0·04	0·01	...	...	0·08	0·03	...	...	...	...	...	...	...	...
Horses	0·15	0·07	0·26	0·16	0·50	0·09	0·27	0·22	0·47	0·17	0·49	0·12	0·26	0·10	2·18	2·54	0·13	0·17
Total Pre-harvesting ...	0·54	0·24	0·50	0·31	1·78	0·33	0·70	0·57	0·85	0·31	1·16	0·27	0·95	0·36	3·06	3·56	0·59	0·74
Harvesting—																		
Truck	0·26	0·11	...	...	...	...	0·14	0·12	...	...	...	...	1·29	0·49	...	...	0·80	1·00
Horses	0·30	0·13	0·10	0·06	0·21	0·04	0·16	0·13	...	...	0·44	0·10	0·06	0·02	1·11	1·29	...	...
Total Harvesting	0·56	0·24	0·10	0·06	0·21	0·04	0·30	0·25	...	...	0·44	0·10	1·35	0·51	1·11	1·29	0·80	1·00
General—																		
Spray	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·13	0·15	...	...
Truck	...	...	0·38	0·24	0·08	0·02	0·08	0·07	1·26	0·45	...	...	...	...	...	...	...	...
Tractor	...	...	0·78	0·49	0·07	0·01	...	...	0·02	0·01	...	...	...	...	...	...	...	...
Horses	0·07	0·03	0·08	0·05	0·01	...	0·03	0·02	0·01	...	0·04	0·01	0·03	0·01	...	...	0·15	0·18
Total General	0·07	0·03	1·24	0·78	0·16	0·03	0·11	0·09	1·29	0·46	0·04	0·01	0·03	0·01	0·13	0·15	0·15	0·18
Grand Total	1·17	0·51	1·84	1·15	2·15	0·40	1·11	0·91	2·14	0·77	1·64	0·38	2·33	0·88	4·30	5·00	1·54	1·92

the year. The total annual cost of each unit included total fuel used, labour cost of maintenance (included in Tables II and IIA), garage repairs, insurance, registration, depreciation charge of 10 per cent., and interest charge of 5 per cent. of the value of the unit. Although depreciation and interest charges do not constitute actual money payments, they are considered to be legitimate costs to the industry. Records for farms 5 and 6 did not permit allocation of repairs, insurance and registration to each field unit, and so these items are not included in the calculations of field power costs. These expenses appear in Tables IV and IVA. Thus field power costs for farms 5 and 6 are slightly lower than if they had been calculated on the same basis as the other farms.

The total cost of operating these units in the case of apples ranged from 0.9 shillings to 2.88 shillings per bearing tree, and in the case of pears from 1.11 to 4.30 shillings per bearing tree. Cost per packed case again reflected the yield per tree. For apples, the range was 0.58 to 8.62 shillings and for pears 0.38 to 5.00 shillings.

Materials and Miscellaneous Costs.

Costs grouped under materials and miscellaneous charges (Tables IV-IVA) include actual payments for such items as sprays, fertilisers, cartage, together with interest and depreciation charges on land, improvements and machinery (excluding field power units) on the basis described previously. As far as it has been possible, depreciation and interest charges to the bearing apples and pears have been based on the proportion of the total value of these assets used in the production of the apples and pears. In evaluating machinery and improvements the farmer's own valuation was used. For the orchard, however, an arbitrary figure of £1 per bearing tree was used for all orchards. This figure includes interest on the orchard land.

The records were not sufficiently explicit to enable actual costs of case materials used in making cases to be extracted. The estimate used was based on the number of loose cases harvested at a price of 1 0½d. per case. Most of the farms sent the fruit in as loose cases to be packed at the Batlow Packing House. The orchardist received 1s. 3½d. for each case left at the Packing House, 3d. being allowed for the making of the cases.

For apples, the total cost of materials and miscellaneous items ranged from 3.19 to 16.29 shillings per bearing tree. For pears, the range was from 5.72 to 24.06 shillings per bearing tree.

On the per packed case basis, the cost ranged from 3.66 to 40.32 shillings for apples, and from 4.15 to 8.99 shillings for pears.

Total Growing and Harvesting Costs.

A summary of total costs up to the time of marketing the fruit for the nine farms is contained in Tables V and VA. In the case of apples, total cost per bearing tree ranged from 6.18 to 23.94 shillings and averaged 15.7 shillings for the nine farms. For pears, the range was from 12.44 to 35.8 shillings and the average 22.58 shillings.

TABLE IV—APPLES.

Cost of Materials and Miscellaneous Charges for Growing and Harvesting Apples on 9 Farms at Batlow (shillings)—1944–45

Farm.	1		2		3		4		5		6		7		8		9	
	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.
Pre-harvesting—																		
Sprays	2·78	1·45	2·10	12·65	1·49	1·71	0·70	4·40	2·85	0·98	1·70	0·70	1·61	1·79	0·99	0·63	1·27	2·23
Fertilizer	0·30	0·16	0·08	0·45	0·06	0·07	0·01	0·05	0·02	0·01	...	...	...	...	0·19	0·12	...	...
Other Fuel	...	...	0·07	0·42	0·04	0·05	...	...	...	...	...	...	...	...	...	...	...	...
Misc. Orch. Expenses ...	0·25	0·13	0·10	0·63	0·15	0·18	0·01	0·09	0·02	0·01	0·28	0·12	0·03	0·04	0·01	0·01	0·19	0·32
Total Pre-harvesting ...	3·33	1·74	2·35	14·15	1·74	2·01	0·72	4·54	2·89	1·00	1·98	0·82	1·64	1·83	1·19	0·76	1·46	2·55
Harvesting—																		
Cases and Case Materials	3·87	2·02	0·34	2·02	2·52	2·90	0·27	1·71	4·89	1·69	4·01	1·66	1·69	1·87	1·88	1·19	0·82	1·43
Cool Store...	0·40	0·21	...	...	1·89	2·17	...	...	2·92	1·01	1·41	0·58	...	...	...	...	...	...
Total Harvest	4·27	2·23	0·34	2·02	4·41	5·07	0·27	1·71	7·81	2·70	5·42	2·24	1·69	1·87	1·88	1·19	0·82	1·43
General—																		
Cartage, Freight ...	0·52	0·27	1·01	6·10	0·03	0·04	...	...	1·81	0·39	0·80	0·36	...	...	0·25	0·16	...	...
Car Expenses	0·06	0·03	...	...	...	...	...	...	...	...	0·66	0·28	...	...	...	...	0·10	0·17
Payroll Tax	0·17	0·09	0·02	0·12	0·06	0·06	...	...	0·09	0·03	...	...	...	...	...	...	...	...
Maint. Improvements ...	1·52	0·79	0·29	1·74	0·07	0·08	0·28	1·75	...	...	0·36	0·15	0·41	0·46	0·09	0·05	...	...
Maintenance Machinery	0·28	0·15	0·11	0·64	0·03	0·03	0·08	0·53	...	...			0·14	0·16	0·16	0·10	...	...
Rates	0·01	0·01	0·01	0·05	...	0·01	0·01	0·09	0·02	0·01	0·01	...	0·09†	0·10†	0·13	0·08	0·01	0·03
*Insurance	0·46	0·24	0·28	1·66	0·18	0·21	0·04	0·24	0·58	0·20	0·18	0·08	0·02	0·03	0·08	0·05	0·03	0·05
General Farm Expenses	0·27	0·14	0·16	0·99	...	...	0·07	0·43	1·20	0·41	0·19	0·08	...	...	0·20	0·12	0·18	0·31
Rent	...	...	...	...	...	...	0·66	4·18	...	...	...	...	...	...	...	...	...	...
Interest—																		
Land and Improvements	1·49	0·78	1·79	10·76	1·20	1·38	0·66	4·15	1·64	0·57	1·85	0·77	1·75	1·95	1·35	0·85	1·49	2·60
*Machinery	0·15	0·08	0·13	0·77	0·04	0·04	0·10	0·62	0·04	0·01	0·11	0·55	0·25	0·28	0·12	0·07	0·21	0·36
Depreciation—																		
Improvements	0·26	0·14	0·05	0·28	0·12	0·14	0·09	0·58	0·12	0·04	0·37	0·15	0·35	0·39	0·21	0·14	0·23	0·41
*Machinery	0·01	0·01	0·17	1·04	0·15	0·17	0·21	1·31	0·09	0·03	0·24	0·10	0·40	0·44	0·15	0·09	0·30	0·52
Total General	5·20	2·73	4·02	24·15	1·88	2·16	2·20	13·88	5·59	1·69	4·77	2·02	3·41	3·81	2·74	1·71	2·55	4·45
Total Materials and Misc. Charges	12·80	6·70	6·71	40·32	8·03	9·24	3·19	20·13	16·29	5·39	12·17	5·08	6·74	7·51	5·81	3·66	4·83	8·43

TABLE IVA—PEARS.

Cost of Materials and Miscellaneous Charges for Growing and Harvesting Pears on 9 Farms at Batlow (shillings)—1944-45.

Farm.	1		2		3		4		5		6		7		8		9	
	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.
Pre-harvesting—																		
Sprays	1·71	0·75	2·29	1·43	3·18	0·59	0·74	0·61	1·66	0·60	0·57	0·13	2·04	0·77	2·04	2·37	0·76	0·95
Fertilizer	0·30	0·13	0·08	0·05	0·06	0·01	0·01	0·01	0·02	0·01	...	...	...	...	0·19	0·22	...	...
Other Fuel	...	...	0·07	0·04	0·04	0·01	...	...	...	...	...	...	...	...	...	...	...	...
Misc. Orch. Expenses ...	0·25	0·11	0·10	0·07	0·15	0·03	0·02	0·01	0·02	0·01	0·28	0·07	0·03	0·01	0·01	0·01	0·19	0·23
Total Pre-harvesting ...	2·26	0·99	2·54	1·59	3·43	0·64	0·77	0·63	1·70	0·62	0·85	0·20	2·07	0·78	2·24	2·60	0·95	1·18
Harvesting—																		
Cases and Materials ...	5·33	2·32	2·66	1·66	8·94	1·66	2·10	1·72	5·87	2·11	10·43	2·44	4·54	1·71	1·38	1·60	1·49	1·85
Cool Store	0·40	0·17	0·12	0·07	9·84	1·83	1·75	1·43	3·51	1·26	3·02	0·71	1·06	0·40	1·54	1·78	0·72	0·89
Total Harvesting	5·73	2·49	2·78	1·73	18·78	3·49	3·85	3·15	9·38	3·37	13·45	3·15	5·60	2·11	2·92	3·38	2·21	2·74
General—																		
Cartage and Freight ...	0·52	0·23	1·01	0·63	0·03	0·01	...	...	1·13	0·41	0·80	0·19	...	...	...	...	...	...
Car Expenses	0·06	0·03	...	...	...	...	...	...	...	...	0·66	0·16	...	...	...	...	0·10	0·12
Payroll Tax	0·20	0·09	0·02	0·01	0·06	0·01	...	...	0·08	0·03	...	...	...	...	...	...	...	...
Maint. Improvements ...	1·52	0·66	0·28	0·18	0·06	0·01	0·28	0·23	...	...	} 0·36	} 0·08	0·41	0·16	0·09	0·10	...	...
*Maintenance Machinery	0·28	0·12	0·11	0·07	0·03	0·01	0·08	0·07	...	...			0·14	0·05	0·16	0·19	...	...
Rates	0·01	0·01	0·01	0·01	...	...	0·01	0·01	0·02	0·01	0·01	...	0·09†	0·03†	0·13	0·15	0·02	0·02
*Insurance	0·46	0·20	0·28	0·17	0·18	0·03	0·04	0·03	0·25	0·09	0·18	0·04	0·02	0·01	0·08	0·10	0·03	0·04
General Farm Expenses	0·27	0·12	0·16	0·10	...	...	0·07	0·06	0·53	0·19	0·19	0·04	...	...	0·22	0·25	0·18	0·22
Rent	...	...	...	...	...	...	0·66	0·54	...	...	...	...	...	...	...	...	...	...
Interest—																		
Land and Improvements	1·50	0·65	1·79	1·12	1·19	0·22	0·48	0·39	0·77	0·28	1·66	0·39	1·67	0·63	1·35	1·57	1·49	1·85
*Machinery	0·13	0·06	0·13	0·08	0·04	0·01	0·03	0·02	0·04	0·02	0·11	0·03	0·25	0·10	0·12	0·13	0·21	0·26
Depreciation—																		
Improvements	0·26	0·11	0·05	0·03	0·12	0·02	0·09	0·07	0·12	0·04	0·37	0·09	0·35	0·13	0·21	0·25	0·23	0·29
*Machinery	0·01	0·01	0·17	0·11	0·14	0·03	0·21	0·18	0·09	0·03	0·24	0·06	0·40	0·15	0·24	0·27	0·30	0·37
Total General	5·22	2·99	4·01	2·51	1·85	0·35	1·95	1·60	3·03	1·10	4·58	1·08	3·33	1·26	2·60	3·01	2·56	3·17
Total Materials and Misc. Charges	13·21	5·77	9·33	5·83	24·06	4·48	6·57	5·38	14·11	5·09	18·88	4·43	11·00	4·15	7·76	8·99	5·72	7·09

* Excluding Field Power Units. † Includes Rent.

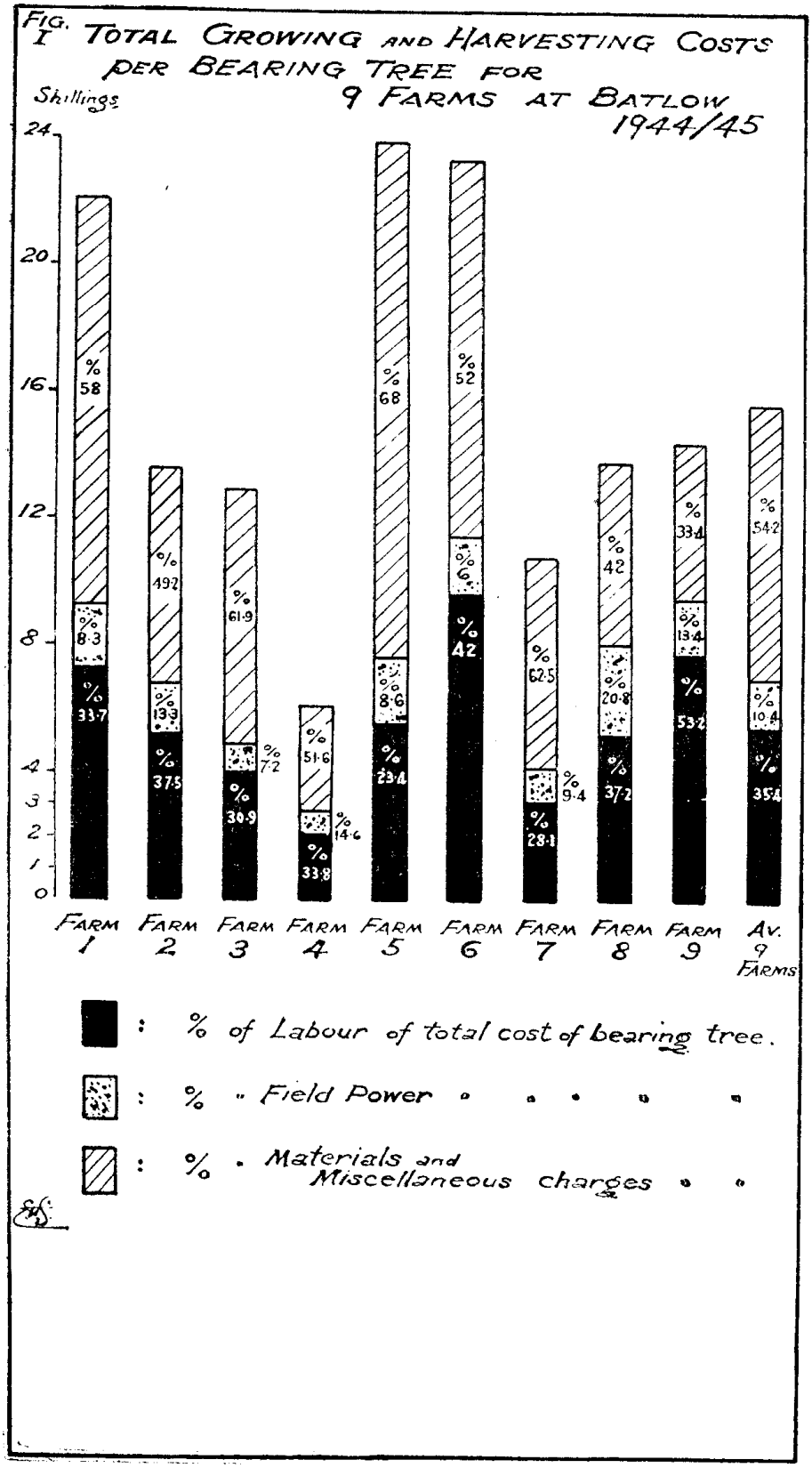
FIG. I TOTAL GROWING AND HARVESTING COSTS PER BEARING TREE FOR 9 FARMS AT BATLOW 1944/45
Shillings
24
20
16
12
8
4
3
2
1
0
% 58
% 8·3
% 33·7
% 49·2
% 13·3
% 37·5
% 61·9
% 7·2
% 30·9
% 51·6
% 14·6
% 33·8
% 68
% 8·6
% 23·4
% 52
% 6
% 42
% 62·5
% 9·4
% 28·1
% 42
% 20·8
% 37·2
% 33·4
% 13·4
% 53·2
% 54·2
% 10·4
% 35·4
FARM 1
FARM 2
FARM 3
FARM 4
FARM 5
FARM 6
FARM 7
FARM 8
FARM 9
AV. 9 FARMS
: % of Labour of total cost of bearing tree.
: % " Field Power " " " " "
: % " Materials and Miscellaneous charges " "

TABLE V—APPLES.

Total Cost of Growing and Harvesting Apples on Nine Farms at Batlow (Shillings) 1944-45.

Farm.	LABOUR.			FIELD POWER.			MATERIALS AND MISCELLANEOUS CHARGES.			TOTAL COSTS.	
	Total Cost.	Cost per bearing tree.	Cost per packed case.	Total Cost.	Cost per bearing tree.	Cost per packed case.	Total Cost.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.
1	15504·0	7·45	3·91	3799·0	1·83	0·95	26624·8	12·80	6·70	22·08	11·56
2	11490·0	5·11	30·90	3972·0	1·81	10·88	14673·1	6·71	40·32	13·63	82·06
3	12257·5	4·01	4·58	2842·2	0·93	1·07	24604·5	8·03	9·24	12·97	14·89
4	3144·1	2·09	13·53	1072·4	0·90	5·67	3801·2	3·19	20·13	6·18	39·33
5	6645·9	5·59	1·92	2445·3	2·06	0·71	18534·0	16·29	5·39	23·94	8·02
6	7609·9	9·81	4·10	1092·3	1·40	0·58	9457·7	12·17	5·08	23·38	9·76
7	2407·2	3·04	3·37	803·1	1·02	1·13	5327·4	6·74	7·51	10·80	12·01
8	2285·4	5·15	3·25	1280·4	2·88	1·41	2577·2	5·81	3·66	13·84	8·32
9	1434·1	7·68	13·41	362·1	1·94	3·39	901·1	4·83	8·43	14·45	25·23
Average ...	.....	5·55	8·77	.....	1·64	2·87	.....	8·51	11·83	15·70	23·47

TABLE VA—PEARS.

Total Cost of Growing and Harvesting Pears on Nine Farms at Batlow (Shillings) 1944-45.

Farm.	LABOUR.			FIELD POWER.			MATERIALS AND MISCELLANEOUS CHARGES.			TOTAL COSTS.	
	Total Cost.	Cost per bearing tree.	Cost per packed case.	Total Cost.	Cost per bearing tree.	Cost per packed case.	Total Cost.	Cost per bearing tree.	Cost per packed case.	Cost per bearing tree.	Cost per packed case.
1	39701·7	8·75	3·81	5329·4	1·17	0·51	59941·6	13·21	5·77	23·13	10·09
2	34163·3	9·83	6·16	5758·1	1·84	1·15	29036·6	9·33	5·83	20·97	13·14
3	4824·0	9·66	1·80	1073·2	2·15	0·40	12028·6	24·06	4·48	35·87	6·68
4	5432·0	4·76	3·89	1036·2	1·11	0·91	6146·0	6·57	5·38	12·44	10·18
5	6683·3	8·24	2·96	1739·1	2·14	0·77	11440·2	14·11	5·09	24·49	8·82
6	7222·1	13·95	3·26	849·6	1·64	0·38	9778·9	18·88	4·43	34·47	8·07
7	1297·9	5·69	2·07	527·2	2·33	0·88	2488·5	11·00	4·15	19·02	7·10
8	1151·1	6·94	8·06	714·4	4·30	5·00	1286·6	7·76	8·99	19·00	22·05
9	710·8	6·65	8·26	165·1	1·54	1·92	610·3	5·72	7·09	13·91	17·27
Average ...	.....	8·27	4·47	.....	2·02	1·32	.....	12·29	5·69	22·58	11·48

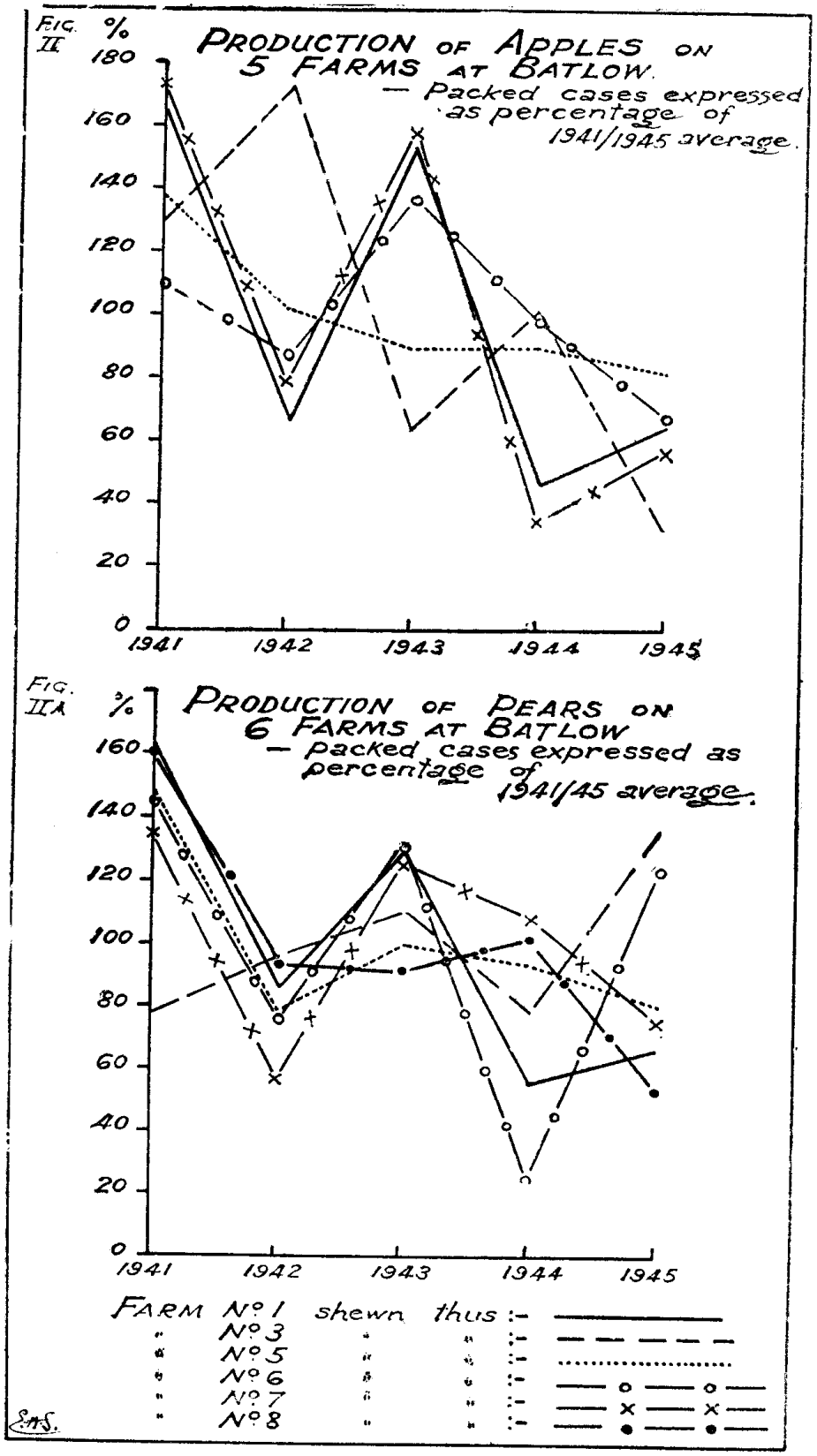
FIG. II
%
PRODUCTION OF APPLES ON 5 FARMS AT BATLOW.
— Packed cases expressed as percentage of 1941/1945 average.
180
160
140
120
100
80
60
40
20
0
1941
1942
1943
1944
1945
FIG. IIA
%
PRODUCTION OF PEARS ON 6 FARMS AT BATLOW
— packed cases expressed as percentage of 1941/45 average.
160
140
120
100
80
60
40
20
0
1941
1942
1943
1944
1945
FARM No 1 shewn thus :-
" No 3 " " :-
" No 5 " " :-
" No 6 " " :-
" No 7 " " :-
" No 8 " " :-
E.M.S.

The percentage cost of labour, of field power, and of materials, etc., of total cost on each farm is shown in Fig. I. For six of the nine farms, labour costs for apples constituted between 30 per cent. and 40 per cent. of the total costs, and the average of the nine farms 35.4 per cent. Field power costs ranged from 6.0 per cent. to 14.6 per cent. of total costs and averaged 10.4 per cent. for the nine farms. Cost of materials and miscellaneous items constituted from 33.4 per cent. to 68.0 per cent. of total costs, and averaged 54.2 per cent.

Total costs for pears comprised from 26.9 per cent. to 47.8 per cent. (average 36.6 per cent.) labour costs; 4.8 per cent. to 22.6 per cent. (average 8.9 per cent.) field power costs; and 40.8 per cent. to 67.1 per cent. (average 54.5 per cent.) materials, etc., costs.

Effect of Yield on Cost per Case.

It has previously been noted that the level of cost per case is dependent largely on yield per tree. Yields of apples and pears expressed as packed cases per tree for each farm are set out in Table VII:—

TABLE VI.

Yield of Apples and Pears on Nine Farms—1944-45.

(Expressed as Packed Cases per Bearing Tree.)

Farm.	1	2	3	4	5	6	7	8	9
Apples ...	1.91	0.17	0.87	0.16	2.90	2.42	0.90	1.58	0.57
Pears ...	2.30	1.60	5.39	1.22	2.78	4.27	2.65	0.86	0.80

In the case of apple costs, although farms 1, 5 and 6 had the highest costs per tree, they had also the highest yields per tree and consequently the lowest costs per case.

For pears too, farms 1, 3, 5, 6 and 7, on which highest yields were obtained, produced pears at a low cost per case in spite of high costs per tree.

This evidence points to the fact that growing and harvesting costs are comparatively fixed whether yields are high or low. That is, the extra cost per tree of producing high yields is comparativly unimportant when costs on a per case basis for the high and low yields are compared.

As total net returns to the farmer depend on the difference between gross receipts per case and total cost per case, and on the number of cases produced, yield per tree directly influences the level of net returns.

Yields for the 1944-45 season were comparatively low on most farms. Levels of production compared with the 1941-45 average for several of the orchards are illustrated in Figs. II and IIA. The alternate cropping characteristic which some fruits, especially apples, tend to develop is apparent in these graphs.

Over the same period the level of gross receipts fluctuated according to level of production (Fig. III). Thus, estimates of costs and returns need to be obtained over a period of several years to furnish a true picture of "normal" returns, and hence of the profitability of the enterprise to the grower.

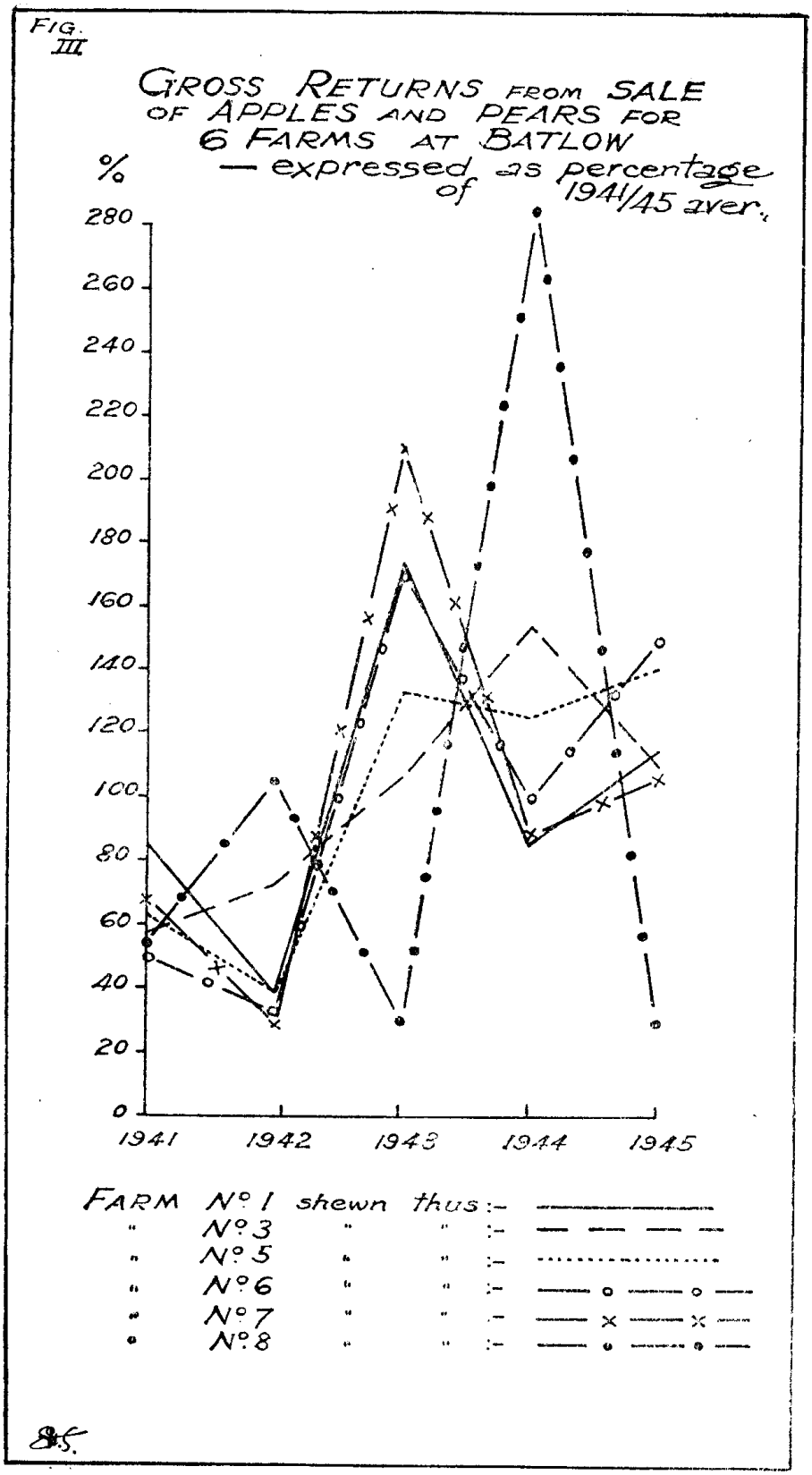
FIG. III
GROSS RETURNS FROM SALE OF APPLES AND PEARS FOR 6 FARMS AT BATLOW
— expressed as percentage of 1941/45 aver.
%
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
1941
1942
1943
1944
1945
FARM No. 1 shewn thus :-
" No. 3 " " :-
" No. 5 " " :-
" No. 6 " " :-
" No. 7 " " :-
" No. 8 " " :-