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*Strawberries -
cost off ok*

Strawberry Production

10,000 Plants : Trickle Irrigation

WINDSOR DISTRICT

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Local Consensus Data Report

- A CONSENSUS OF COSTS & RETURNS

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August 1976

Bulletin M/LCD: 6

MID COAST & HUNTER REGION

*

new with notes
N.S.W. DEPARTMENT OF AGRICULTURE

THE LOCAL CONSENSUS DATA TECHNIQUE

The L.C.D. or Local Consensus Data technique is a way of obtaining an accurate picture of costs and returns for a particular farming system in a particular locality.

A small group of interested farmers, experienced in a type of farming, meet with officers of the Department of Agriculture to discuss all the practices which have a bearing on the costs and returns of a typical farm in the farming system being studied.

As discussion proceeds, a consensus of opinion, or agreement, is reached on the size and nature of the typical farm and on all aspects of production such as cultural operations, machinery used and time involved. Consensus is arrived at about prices or costs of inputs, normal yields, and expected returns.

It is important to realise that the figures published in these reports are not average figures, but typical figures for farmers represented by the group who provided the data.

Typical figures are in many ways more realistic than average figures. Averages can be biased by unusual or radically different practices which calls for a knowledge of the range of inputs making up the total and a high degree of skill in interpreting the results.

Care must still be taken in applying the figures contained in this report to individual cases. You can be sure, however, that the information in this report has been agreed to by a group of experienced, practicing farmers on the assumption that they apply to a typical farm operated at a reasonable standard of management in a particular locality.

The management procedures in this report are a consensus of opinion of current practices. They do not necessarily represent or imply any recommendation of the Department of Agriculture.

ACKNOWLEDGEMENT

It would not have been possible to produce this consensus report without the valuable assistance of those Windsor District growers who participated. They willingly gave us both their time and valuable information from their experience.

STRAWBERRY PRODUCTION

10,000 plants; trickle irrigated

WINDSOR DISTRICT

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LOCAL CONSENSUS DATA REPORT

A CONSENSUS OF COSTS & RETURNS

September, 1976

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INTRODUCTION

The information in this report has been compiled from the consensus of opinion of a group of part-time strawberry growers in the Windsor district. They have built up a picture of a typical part-time strawberry farm in that locality and have agreed on cultural operations, costs of production, yields and returns.

This is not a handbook on strawberry growing. For full details of strawberry culture, please ask for the Department's free bulletin H 131 or consult your local District Horticulturist.

In the late 1960's there was a dramatic revival of the strawberry growing industry in New South Wales. Release of improved, highly productive varieties, the availability of disease-free plants under Certification Schemes and improvements in production and marketing methods have all influenced this recovery.

Census figures in 1975 show there are 82 hectares of strawberry plantings in the State and 145 growers. Of this area, 62 hectares and 93 growers are located in the County of Cumberland and Colo, Blue Mountains and Wollondilly Shires.

As strawberry production is an intensive form of farming, the current economic climate, with increasing costs and declining profits or income, make growers increasingly aware of their situation and the importance of enterprise profitability.

OBJECTIVES

This report was prepared to provide an estimate for costs of production and the expected returns for strawberry growing on a typical small area farm.

This information can be an important guide in decision-making, i.e. capital requirements, potential cost/returns and labour inputs for a particular farming enterprise.

THE TYPICAL STRAWBERRY FARM

By consensus of opinion, the group decided on the following description of the typical strawberry farm in the Windsor district.

The residential property is owned and operated part-time as a family farm. The husband holds full-time employment away from the farm. He undertakes all cultural and production operations required in this part-time enterprise. The wife assists primarily with harvesting and packing the crop. Casual labour is employed during peak periods of harvesting and packing.

1. FARM DESCRIPTION -	House, shed and roads - 0.6 hectare	(1½ acres)
	Arable land - 1.0 hectare	(2½ acres)
	Dam site - 0.4 hectare	(1 acre)
	<hr/> TOTAL	<hr/> 2.0 hectare (5 acres) <hr/>

2. PREVIOUS LAND USE - The arable area, growing native pasture, was used for grazing. Some light clearing of shade trees and deep ripping was necessary in initial site preparation.

3. THE PLANTING - The typical part-time Windsor strawberry grower has 10,000 Torrey plants growing on a rotational basis over the available arable land. Half these plants are one year old and the other half two years old. All plants are retained for two years. Vacant land is not used for any other enterprise.

To ensure the continuation of this planting system, a site is prepared and planted to 5,000 new plants every year. The 5,000 two-year-old plants are then removed after the autumn crop.

In a development programme, the initial planting is 5,000 fresh Torrey plants. A further 5,000 plants are established the following year.

The planting method is a double row system in raised beds. The rows and plants are spaced 300 mm (12") apart.

4. IRRIGATION SYSTEM - The planting is irrigated through a trickle irrigation system from a dam constructed on the property. A small electric pump is used to supply the required water. Overhead irrigation may be a suitable alternative in some situations.

5. BUILDINGS - The property has an existing 3-bedroom, brick veneer home valued at \$30,000. The cost of this home is not included as a capital item in the strawberry enterprise as it is the principal family residence.

A combined packing and machinery/storage shed, measuring 6m x 9m (20' x 30') has been constructed on the property. It has a concrete floor, electricity is connected and a partition separates the two areas.

A portable, secondhand cool room with a capacity of 5 cubic metres is installed at one end of the packing area.

6. PLANT AND MACHINERY - Here is a list of plant and machinery to be found on our typical 10,000 plant, 2 hectare strawberry farm.

<i>Item</i>	<i>Description</i>	<i>New/Second-hand</i>	<i>Estimated Cost 1976 \$</i>
Tractor	22 kW (30 hp) petrol	Secondhand	1,000
Commercial vehicle*	Station waggon	New	3,929
Mouldboard plough	2 furrow	Secondhand	200
Disc harrow	18 plate, 350 mm scoloped, sealed bearing	New	465
Carryall	Sides added	New	150
Spray	PTO direct-coupled, 8 GPM 200 PSI, with boom and handspraying nozzle	New	300
Bed former	Local manufacture (tool bar with crowder)	New	200
Irrigation motor and pump	Electric	New	500
Irrigation System	Mains, filters, control valves, risers, laterals, micro tubes	New	400
Picking trays	6 timber trays (plus handles and foam)	New	24
Packing benches	2 tables 2m x 1m	Secondhand	20
Scales	Metric, 1000 grams	Secondhand	150
Film dispenser	Wrapping machine	New	120
Cool room	Portable, 5 cubic metres	Secondhand	500
Sundries	Hand tools and equipment	New	300
Total Cost of Plant and Machinery			<u>\$8,258</u>

* Purchase price of \$5,500. Estimated 5/7th for business use.

7. MARKETING - All marketable berries are packed in aluminium foil punnets and consigned to a licensed commission agent at the Flemington Markets. Typical yield is 1½ punnets per plant per year although yields of up to 2½ punnets per plants could be achieved.

4.

8. CAPITAL INVESTMENT

	\$
2 ha of land at \$15,000 per hectare (includes suitable stock-proof boundary fence)	30,000
Shed for packing, machinery and storage	2,500
Plant and machinery (from page 3)	8,258
Dam - 2.3 megalitres (500,000 gallons)	1,000
Clearing and ripping - 1 ha (2½ acres)	150
TOTAL CAPITAL INVESTED	<u>41,908</u>

ESTABLISHMENT AND CULTURAL PRACTICES

Under a reasonable standard of management, the following establishment and cultural practices are carried out.

1. SITE PREPARATION - An initial ploughing is carried out in June/July, nine months before each new planting. A fallow of six months for weed control is then maintained with two discings. Before the last discing (November) 3 tonnes of poultry manure is applied to the 0.1 ha site. Lime is also applied at this time, depending on the pH factor (optimum 6 - 6.5).

Final preparation (March) of the planting site, for bed formation, involves one ploughing, one discing and then one contract rotary hoeing. Superphosphate (250 kg) and sulphate of potash (50 kg) is applied before the discing.

Once the ground has been prepared to a fine tilth, the beds are formed, shaped, consolidated and smoothed using a bed former and hand labour. The trickle irrigation lines and black plastic mulch are then laid, also by hand.

To reduce hand labour, two alternatives are available.

A contractor with a special machine which attaches to the grower's tractor can be hired. This machine forms the beds and lays the plastic mulch automatically. The contractor charges approximately \$150 for 0.1 ha ($\frac{1}{4}$ acre) including the cost of the plastic and his labour.

Alternatively just the machine which forms the beds and lays the plastic can be hired. The grower must be prepared to transport this machine to his property and return it. He will also, of course, need a tractor and will provide his own plastic. The cost of this machine is worked out on the basis of \$10 per roll of plastic used. Two rolls are needed for 5,000 plants.

Pre-plant fumigation may be required on certain sites, e.g. for verticillium wilt control in old vegetable land.

A contractor is available to carry out bed formation, supply and lay polythene mulch and to supply and inject soil fumigant at approximately \$200 per 0.1 ha ($\frac{1}{4}$ acre).

STRAWBERRY SITE PREPARATION CALENDAR - 5,000 PLANTS, 0.1 HA (¼ ACRE)

Month	Activity	Implement	Remarks
June/July	Initial Ploughing	Mouldboard	.
September	Cultivation	Disc Harrows	Fallow - weed control.
November	Poultry manure Lime		Spread evenly 3 tonnes. About 250 kg, subject to soil pH.
	Cultivation	Disc Harrows	Fallow - weed control and incorporate fertilizer.
February/ March	Ploughing	Mouldboard	
	Superphosphate		250 kg (5 cwt)
	Sulphate of Potash		50 kg (1 cwt)
	Cultivation	Disc Harrows	
	Cultivation (Final)	Rotary Hoe	CONTRACT - prepare fine tilth.
	Bed formation	Bed former	Completed by hand.
	Irrigation		Complete installation of trickle system by hand.
	Plastic laying		By hand.

2. PLANTING - Fresh Torrey plants are planted in a double row system in March/April, or as soon as available. Current plant cost is \$70/1,000 for certified runner plants.

Frozen plants are also available for planting in February.

3. PEST AND DISEASE CONTROL - Spraying is undertaken with a boom spray. A hand wand is also available for soil jetting, herbicides and hand spraying when required.

The number of sprays required for pest and disease control will vary widely from year to year depending on seasonal conditions. However, the following spray programme is typical for this district.

Sometimes sprays are combined which saves labour.

Grey Mould

Grey mould causes heavy fruit losses under unfavourable weather conditions e.g. prolonged wet weather. Ten sprays of either captan or benomyl are required to give adequate control.

Leaf Spots and Gnomonia Fruit Rot

These diseases could prove troublesome in autumn and three sprays of copper oxychloride may be required for control.

Two-Spotted Mite

Two-spotted mite is the most serious and difficult pest to control in strawberries. Seven sprays of either chlorodimeform* or cyhexatin may be required to give adequate control, particularly in the winter.

Aphids, Caterpillars and Cutworms

One or two sprays per year from the wide range available may be required to control these pests.

Curl Grubs

One soil jetting of DDT per year could be required to control this pest.

Snails and Slugs

Two baitings per year of a commercially available product may be required for adequate control.

Miscellaneous

In certain situations ripe rot and birds may require special attention.

4. SOIL MANAGEMENT - Pathways between beds are mulched in August with softwood shavings, to suppress weed growth and prevent soil splashing onto the berries.

Knockdown herbicides, paraquat and diquat, are used as required to control weeds in the pathways. Five or six applications are needed each year.

5. IRRIGATION - Strawberry plants have a high moisture requirement particularly while cropping. An average of 40 irrigations of 8 hours duration are required per year, depending on seasonal conditions.

6. PLANT MANAGEMENT - Runners are removed by hand during the picking period. Careful use of knockdown herbicides can burn off runners in pathways.

Plants are cut back in February to remove all leaf growth and promote autumn cropping.

Light trimming and clearing up is carried out on first year plants, in the winter, after the autumn crop is completed.

Trickle irrigation laterals and plastic mulch are removed before destroying second year plants each winter by disking after the autumn crop.

* Now withdrawn by the manufacturers and not recommended.

7. SIDE DRESSING FERTILIZER - Side dressing will not be required during the first year with adequate basal applications of fertilizer. Small side dressings in second year plantings may be required. This will depend on seasonal conditions, cropping and soil fertility.

Farm Organization Calendar

[illegible]

COSTS OF STRAWBERRY PRODUCTION

ANNUAL OVERHEAD COSTS		\$
Council Rates		200
Insurance Premiums - Workers Compensation	\$340	
- Commercial Vehicle*	\$150	
- Machinery/Packing Shed	\$35	
- Machinery	Nil	
- Public Risk Insurance	<u>\$22</u>	547
Commercial Vehicle Registration*		90
Office and Stationery Expenses and Telephone (50 hours per year spent on office work)		150
Bank Charges (not including interest)		20
Accountancy Charges		30
Miscellaneous Fees, Licences etc.		20
Labour - (No permanent labour employed)		-

Depreciation - Plant and Machinery

	1976 Cost \$	Expected Life (years)	Trade-in Value \$	Depreciation \$
Tractor	1000	10	700	30
Commercial Vehicle†	3929	5	1071	571
Mouldboard Plough	200	10	100	10
Disc Harrow	465	15	100	24
Carryall	150	15	50	7
Sprayer	300	10	30	27
Bed Former	200	15	50	10
Irrigation Pump & Motor	500	15	50	30
Irrigation - Mains, filters, hydrants etc.	200	15	20	12
Irrigation - Trickle laterals with microtubes	200	6	-	33
Picking Trays	24	7	-	3
Packing Benches	20	10	-	2
Scales	150	10	50	10
Film Dispenser	120	10	20	10
Cool Room	500	10	100	40
Machinery/Packing Shed	2500	30	250	75
Boundary Fencing	750	15	-	50
Sundries	300	15	30	18
				<u>962</u>
TOTAL OVERHEAD COSTS				<u>\$2,019</u>

* 5/7th annual cost allowed.

† 5/7th annual depreciation allowed.

ANNUAL RUNNING COSTS	\$	
Fuel and Lubricants (vehicle*, tractor and plant)	345	
Electricity (shed, irrigation and cool room)	<u>70</u>	\$415
<u>Repairs and Maintenance to Plant and Machinery</u>		
Tractor	50	
Commercial Vehicle*	357	
Mouldboard Plough	5	
Disc Harrow	5	
Carryall	5	
Sprayer	10	
Bed Former	5	
Irrigation - Pump & Motor	5	
Irrigation - Mains, filters, hydrants etc.	30	
Irrigation - Trickle laterals	20	
Picking Trays	5	
Scales	2	
Film Dispenser - wires	5	
Cool Room	50	
Machinery/Packing Shed	25	
Boundary Fence	25	
Sundry Repairs and Maintenance	<u>20</u>	
(About 120 hours per year would be spent on maintenance.)		\$624

Ground Preparation and Establishment of 5,000 Plants

	Labour (hours)	Materials (Cost) \$	
Site Preparation	6		
Fertilizer Application	4		
Fertilizers - poultry manure			
3 tonnes (10 cu yds @ \$2.50/cu yd)		25	
- lime 250 kg		8	
- superphosphate 250 kg		18	
- sulphate of potash 50 kg		8	
Rotary Hoeing - contract		25	
Bed Formation	16		
Plastic Mulch and Irrigation laying	16		
Plastic Mulch - 2 rolls @ \$36		72	
Preparation, Planting and Aftercare	50		
Plants (fresh) 5,000 @ \$70/1000		350	
Wood Shavings Application	12		
Soft-wood Shavings - 19 cu m (25 cu yds @ \$2/cu yd)	<u> </u>	<u>50</u>	
	104		\$556
TOTAL (carried forward)			<u>\$1,595</u>

* 5/7th of annual cost

ANNUAL RUNNING COSTS - continued

TOTAL (from previous page)

\$1,595

Annual Cultural Costs for 10,000 Plants

	Labour (hours)	Materials (Cost) \$
Spraying		
(a) Pests - two-spotted mite (7 sprays)	14	46
- aphids)		
- caterpillars)	4	8
- cutworms)		
- curl grubs (1 soil injection)	16	2
- snails and slugs (2 baits)	2	12
(b) Diseases - grey mould (10 sprays, some applied with insecticides)	12	34
- leaf spot/gnomonia (3 sprays)	6	6
(c) Herbicides - paraquat and diquat (6 sprays)	48	16
Irrigation	40	40
Cutting-back	60	
Trimming and removal of second year plantings	40	
	242	\$164

Annual Harvesting Costs for 10,000 Plants (1½ punnets per plant)

	Labour (hours)	Materials (Cost) \$
Picking @ 20 punnets/hour	750	
Packing @ 20 punnets/hour	750	
Casual labour picking and/or packing employed 750 hours @ \$3.00/hour		2,250
Punnets @ \$28/1000		420
Cartons, capacity 20 punnets, @ 40¢ each		300
Assemble and stamp cartons	12	
Wrap film @ \$22/roll		83
Freight @ 30¢/carton		225
Agent's Commission - 10%		825
	1,512	\$4,103
TOTAL ANNUAL RUNNING COSTS		\$5,862

PROFITABILITY OF STRAWBERRY PRODUCTION

Gross Income (750 cartons @ \$11.00)	\$8,250
<i>less</i> Overhead Costs	\$1,057
<i>less</i> Running Costs	\$5,862
= Nett Farm Income From Strawberry Growing	<u>\$1,331</u>
<i>less</i> Depreciation	\$962
= Nett Return For Owner's Labour and Capital	<u><u>\$369</u></u>

The total annual labour required to produce and market strawberries from 10,000 plants is 2,028 hours. Of this, 750 hours will be carried out by casual employees during the peak harvest period at \$3 per hour. The remaining labour, 1,278 hours, is supplied by the husband and wife throughout the year.

The nett return for the owner's labour and capital is \$369 which represents the return of a very low 29 cents per hour.

CONCLUSIONS

1. Strawberry growing on the typical Windsor district farm, with an average marketable yield of $1\frac{1}{2}$ punnets per plant and an average gross market value of \$11.00 per carton, will not produce a satisfactory return on capital or for the owner's labour.
2. If marketable yields could be increased to $2\frac{1}{2}$ punnets or more per plant, and the gross market value received exceeds \$13 per carton, the family unit could expect a return of \$3 or more per hour for their labour.
3. Profitability could also be increased if a market for second grade berries were available locally.
4. Many families place considerable importance on the social values associated with rural living. They also receive other financial benefits from strawberry growing as a form of primary production.

APPENDIX 1

Effect of varying yields and prices on return to owner's labour
(assuming nil return on capital).

		yield (punnets per plant)				
		1	1½	2'	2½	3
		Dollars per hour				
Price per carton of 20 punnets	\$10	-\$1.43	-\$0.24	\$0.56	\$1.13	\$1.55
	\$11	-\$0.99	\$0.29	\$1.14	\$1.76	\$2.21
	\$12	-\$0.55	\$0.82	\$1.73	\$2.39	\$2.88
	\$13	-\$0.11	\$1.35	\$2.32	\$3.02	\$3.54
	\$14	\$0.33	\$1.87	\$2.91	\$3.65	\$4.20

Thus the typical Windsor strawberry grower must average at least 2½ punnets per plant and receive \$13 per carton to earn farm hand's wages of around \$3 per hour.

APPENDIX 2Strawberry Growing Development Budget (10,000 plants)

- Assumptions - capital cost of land, shed, machinery and dam not included.
- previous land use to have been grazing on native pastures.
 - some shade trees to be cleared.
 - no machinery purchased in first year. Contractors used, therefore overhead and cultivation costs lower in the first year.
 - yield to average 1½ punnets/plant and return \$11/carton (20 punnets).
 - 5,000 plants established each year. Plants kept 2 years.

	Year 1	Year 2	Year 3	Year 4	Year 5
Gross Income		4125	8250	8250	8250
Overhead Costs	717	2019	2019	2019	2019
Clearing & Ripping	150	-	-	-	-
Cultivation & Planting	113	556	556	556	556
Growing Costs	-	82	164	164	164
Harvesting Costs	-	927	4103	4103	4103
Repairs & Maintenance	-	624	624	624	624
Fuel, Lubricants & Electricity	-	277	415	415	415
Total Cost	980	4485	7881	7881	7881
Accumulated Profit/Loss	-980	-1340	-971	-602	-233

The project will break even in the sixth year by a small margin, but only if the owner's labour is not costed and no return on capital is included.