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CONTRACT FARMING AND THE BROILER INDUSTRY

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The growth of contract production in certain types of farming is noted, and the main implications of this form of business organization for on-farm decision-making and capital acquisition are identified. The purposes of contracting, from both processor firm and farm viewpoints are discussed, and the broiler industry is used to illustrate the development of contracting.

Introduction

It is probably an oversimplification to regard the overseas interest of agricultural economists in industry structure of the 1960's as a direct outgrowth of the exploration of industry integration of the 1950's. Nevertheless attempts to examine new forms of business organization, take-overs, mergers, market concentration, etc. within the conceptual mould of the orthodox theory of the firm must lead to examination of the consequences which such changes in the structure of the processing-marketing sector have for the farm sector. Also, development of decision theory in farm management on the one hand, and on the other the allegedly declining sphere in which such theory can be applied, must emphasize the importance of the business framework within which on-farm managerial decisions are made.

In Australia analysis of structural change in agricultural marketing and processing has been comparatively neglected, as have been the resultant changes in farm business organization, capital structure and operator decision-making. One important element of such structural change is the apparent increase in the incidence of contract production, or contract farming. For the purposes of this paper, contract farming is defined as an agreement at any level of formality by which a non-farm firm—be it a factor supplier or a product processor—agrees to buy from and/or sell to a farmer intending to produce the commodity or use those factors. Throughout, the term "firm" will be used as an abbreviation to distinguish suppliers of factors to agriculture and processors of agricultural commodities from growers or farm business units.

The conditions of agreement will most commonly concern commodity and/or factor prices, quantities, quality, delivery time, and less commonly methods and location of production. Only contracts among substantially independent firms and growers are of interest. The forms of the contract may range from verbal agreement to legally drafted and apparently formidable documents.

The purpose of this paper is to attempt to identify the implications of contract farming for operator decision-making, acquisition of farm credit and development capital, and farm ownership. Contract production has emerged as the basis of the broiler industry and this industry is used here to illustrate the development of an advanced contract system.

Extent of Contract Farming

It is presently not possible to determine the extent of contract farming in Australia or to estimate accurately the percentage of various com-

modities that are produced under contract. On the national level possibly 90 per cent of all meat chickens and a similar percentage of processing vegetables are produced under contract. Seed production of hybrid maize, sorghum and sudax is largely if not entirely contracted. Beyond these, the diversity of contracted commodities is apparent in the following partial list: slaughter cattle, potatoes (several processes), oilseed crops, ornamental plants and fat lambs.

To consider one area, New England and the adjacent Slopes, contracts have been reported for peas and beans, lucerne, milo, practically all hybrid seed and oilcrops, waxy sorghum, pop-corn, potatoes and broilers. The diversity here might inflate the importance of contract farming in the area in relation to the very small output of some of these commodities; but on the other hand there is little doubt that contract farming has emerged as an important structural element in the specialized industries.

While the data are fragmentary and thus force one to an examination of cases that may show no consistent pattern, it nevertheless does provide sufficient basis for identifying the main incentives to contracting from the viewpoints of both parties.

Purposes of Contracting by Firms

Access to Materials

As contract farming has so far developed, the usual first interest of the firm is in acquiring ownership rights with respect to the commodity. This implies a commodity cost to the firm lower than could be achieved by direct production or purchase in the open market. The point is of more than formal interest: the firm's current commodity acquisition policy may be determined by its own stage of development or the level to which it has been able to develop the final (usually retail) market for various forms of the commodity. If contracting has brought into existence a body of specialized contract growers these may well become reduntant when the firm moves to a higher level of development. Recent developments in the United States broiler industry illustrate this possibility.

Useful distinction can be made between acquisition of exclusive rights to the grower's output and merely access rights. The Australian broiler industry has many of the standard features of monopsonistic competition at all except the grower level: it is not surprising to find most contracts between processors and growers grant exclusive purchase rights to the firm. On the other hand contracts between growers and factor supply firms—e.g., hatcheries, feed companies—while committing these latter to purchase of the farmer's output do not usually restrict his right to develop alternative outlets for his product.

Contracts granting exclusive purchase rights to the firm are usually motivated by the firm's attempt to develop a monopolistic position or to protect its investment in a new product. Several of the industries noted above have been largely created by the contracting firm, requiring either past research expenditure or importation of overseas technology; private firm benefits would obviously be reduced if competitors gained access to the product or the grower's acquired technology.

Credit Supervision

The rather complex contract tie-ups found in some industries, together with the internal system of production credit among parties, is another

reason for exclusive commodity rights. For example a four-party contract among independent hatchery, feedmill, and processor on the one hand and growers on the other is much easier to police than if growers are free to sell to processors outside the group.

Processing Plant Efficiency

In other situations a firm's contracting purposes do not require insistence on exclusive rights. Maximum engineering efficiency in processing plant operations and/or distribution implies an optimal commodity intake schedule. Whether processing plant or distribution efficiency is the primary objective will depend on the degree of capital intensity in processing relative to storage and distribution costs in the particular industry.

The milo contracts in north-west N.S.W. are aimed primarily at achieving distribution efficiency in the finished product, stock feed, over time. Here processing (mixing) costs are small relative to the cost of product distribution over time. Milo growers are offered an open delivery price (pegged to central market price at some specified date) but time of delivery to the processor is specified: growers can contract for both production and on-farm storage. The firm's contracting purpose is to obtain access to raw material for meeting projected demand for feeds incorporating several seasonally produced commodities.

For most of the smaller broiler processors operating without guaranteed markets, the purpose of contracting with growers is based largely on plant efficiency. Broilers are probably the most flexible commodity with respect to supply scheduling: batch production time is short, and the growing process can be "cut off" or extended to meet plant or market requirements. The N.S.W. broiler industry offers the example of one firm installing a very large processing plant, achieving the efficient operation of which appears to have, for some time, dominated other operating criteria in this multi-divisional organization.

If the firm's plant economics provide the basic contract incentive, and necessary grower supply price is a function of grower output level, it may be desirable to facilitate greater grower efficiency by encouraging entry of other buyers or processors into the area. One small potato-products factory in northern N.S.W. offers an example of this situation: its own demand is not sufficient to induce among contract potato growers specialization which would permit economies of size (and potentially lower contract prices) in the growing operation. In such cases the monopsonistic advantages enjoyed by an isolated firm may be more than offset by the absence of external economies.

Quality Control

Quality control also is a basis for commodity supply contracts but this does not necessarily require exclusive rights to farmers' output unless, as noted above, achieving this objective requires investment in extension activities by the firm.

Factor Sales

As noted above, most contracted agricultural production in Australia is directed to acquisition of the commodity. However, the broiler industry offers examples of contracting directed primarily to guaranteeing disposal of the initiating firm's output. Most of the initial impetus to integration

in the broiler industry in Australia has been from established hatcherymen; their objective in offering contracts to growers has been to force an entry into the chick market or to protect an established market. Similar initiative has come from feed firms.

Purposes of Farmer Contracting

These concern price stability, market outlets and acquisition of resources. They are summarized below.

Price Stability

The price stability offered in most contracts is short term; contract prices offered for more than a batch-to-batch or crop-to-crop basis are rare. Thus contracts offer only limited price stabilization benefits. In addition contract price is sometimes stated according to a quality schedule; and it is the firm's prerogative to decide on commodity grades. This rather obvious device can be used to reduce payments when glut supplies occur which the firm is, under the contract, obliged to accept.

Market Outlets

A more important purpose of most contracts is related to their giving access to markets otherwise closed to the grower. For several specialty crops, e.g., hybrid seeds and some canning crops, there is no real alternative to contract production. Also, one effect of the development of supermarkets and retail food chains is the concentration of purchasing: in the absence of grower co-operatives this type of demand can be met by a marketing firm—or processor—initiated organization of growers through contracts.

Acquisition of Factors and Technology

Contract production has developed most in the specialized agricultural industries of which a feature is the monopolistic position of the firm with respect to essential farm inputs. Because relatively new farm enterprises are involved for which grower technology in an area is often lacking, it is not surprising to find the contracting firm performing research and extension functions, as well as supplying physical production factors and contracting for output.

If grower technology is entirely lacking it may be necessary to go further. At least one northern N.S.W. vegetable processing firm approves the crop site, specifies fertilizer application, provides seed and insecticides as well as supervising all operations from land preparation to harvesting. This latter is done directly by the firm. All necessary specialized growing equipment is rented to the grower. The role of the firm's fieldman service in this instance clearly goes beyond an advisory function. A similar situation exists under many broiler contracts which can amount to supervision of the farmer on his own farm. In other cases, e.g., oilseed contracts, the fieldman service provided to growers is advisory; they are free to accept or reject the firm's recommendations.

Farm Capital and Industry Entry

Acceptance of the type of closely supervised vegetable production contract noted above which also makes specialized equipment available to the grower represents an alternative to individual investment in these items. Renting these items will usually be cheaper than ownership.

Where the contract enterprise requires grower investment it is not uncommon for the necessary credit to be advanced by the contracting firm, especially—as in the case of feed firms supplying on-farm feed equipment—if the farmer's investment in this equipment will increase sales or reduce the handling costs of the firm. Provision of bulk on-farm equipment by feed companies, to be recovered at hire-purchase rates out of farmer's batch proceeds, is common in the broiler industry.

Perhaps more important is use of the contract as a form of collateral for loans made by normal lending agencies. It is doubtful if the type of contract discussed here has any intrinsic market value; in addition it is usually of short-term duration. Still, there is little doubt that contracts have been accepted by banks and other lending institutions as evidence of grower competence and, more importantly, of access to commodity markets. Lacking data one can only again quote cases. At least three broiler firms "arrange" developmental finance for selected growers by this means. This falls short of formal guarantee or endorsement of the loan and commits these firms to no liability. The degree to which normal security requirements are varied in these cases is not known. There is no doubt, however, that the firm-grower relationship—quite apart from specific contracts written from time-to-time—can have a tangible value to the grower.

Entry into Agriculture

The types of credit made available through some forms of contracting can partly remove the barriers faced by some families wanting to enter agriculture. Contracts can be used as an alternative rung in the traditional farm-ownership ladder: apart from credit aspects, the expert advice or supervision available under some contracts offers an alternative to the "hard (and possibly costly) school of experience". In some industries, notably broilers and vegetables, lack of enterprise experience can facilitate obtaining a contract; the contractor's preference for inexperienced growers being based on their more ready response to changing technologies and market requirements, and willingness to accept supervision.

The Broiler Industry

The broiler industry illustrates the fullest use of production contracts. It is probably the most rapidly developing minor agricultural industry in Australia. Skaller has described the genetic progress made by hatcheries;[1] Brann and others have described in general terms some aspects of the early growth of the industry.[2] However, quantitative descriptive material relating to most aspects of the industry is lacking. Official broiler production statistics for some States became available only in 1965.

The broiler industry here, as in the United States and elsewhere, offers clear illustration of the costs, consequences and requirements for contract farming. There is some evidence that other intensive agricultural industries, e.g. pig production, may also have to face this type of structural adjustment in the future.

In most States (notably the biggest producer, N.S.W.) the broiler industry has only recently been recognized for statistical purposes. Broiler

[1] Skaller, F., "Some problems concerning the development of a poultry meat industry in Australia", *Proc. Aust. Soc. Anim. Prodn.* 3: 20-8, 1960,

[2] Brann, V. H., "An expanding industry: broiler growing", *Agric. Gaz. N.S.W.* 75: 819-24, 1964.

processing, an essentially industrial process, has not been covered by secondary industry statistical returns.

Immaturity of the industry is also evident in that broiler producers and processors tend to regard their competitors as being restricted to other broiler operators, rather than producers of other meats. At the present stage of development there is a reluctance to divulge data relating to number of farmers under contract, marketing margins, effectiveness of promotional expenditure, etc.

Changes in all phases of the industry have been very rapid: developments in genetics, nutrition and feed conversion efficiency have received more attention than the equally important but more difficult to quantify changes in the ownership and organizational structure of the industry which have occurred through mergers, take-overs and the creation of subsidiary processing and marketing operations.

Broiler Production and Prices

An attempt has been made to estimate Australian broiler production by surveying some sectors of the industry directly and supplementing data thus obtained with material from other sources.

The most recent 1962-63 Commonwealth estimate of per capita poultry consumption is 9·7 pounds, a level which has not changed since 1938-39, although the tentative suggestion is offered that broiler consumption might be (1962-63) in the region of 4 pounds per capita. Recent unofficial consumption estimates by individuals in the broiler industry range from 7 to 10 lb. per capita. A mid-1964 estimate by an authority in the industry was a total national broiler consumption of 40 million lb.

The production shown in Table 1 represents a pooling of estimates made by various bodies and individuals. Data relating to chick sales throughout Australia were obtained from the four major foundation-broiler hatcheries in N.S.W. and used as a check on production estimates from other sources. Assuming a total 1964 production of 41 million birds, and an average liveweight of 2·8 pounds reduced to 2·1 pounds by a 75 per cent recoverable meat yield, total production would be in the neighbourhood of 86·1 million pounds, approximately 7·7 pounds per capita. This is, of course, in addition to other poultry meats (cull hens, cockerels, turkeys, etc.).

Data relating to the rate of growth of the industry over the past four-year period are more difficult to obtain. Selected chick sales data for the leading N.S.W. foundation hatcheries are presented in Table 2. It is believed these three hatcheries account for 80-90 per cent of all meat-type chick sales in Australia. As the data do not cover these hatcheries' sales in all States they do not represent total sales, but illustrate the rate of increase over the 1961-64 period.

No official broiler price series is available, nor is sufficient data available from processors and wholesalers to enable determination of statistical relationships between broiler sales increase and the following factors: (a) movement of prices at wholesale and retail; (b) increase in advertising and promotional expenditure by processors and retail groups (particularly the larger chain stores); and (c) prices of competing meats (fish, lamb, etc.). In any case it is probable that the newness and dynamic nature of the industry would prevent extraction of meaningful demand relationships at this time.

TABLE 1

Estimated Australian Broiler Production by States, 1964

State	No. of birds processed
	(m.)
Queensland[a]	7·5
New South Wales[b]	15·0
Victoria[c]	8·5
Tasmania[d]	0·5
South Australia[e]	2·4
Western Australia[f]	2·7
Reported by hatcheries, but not assignable to States	4·0
Total	40·6

(a) Queensland Department of Primary Industries estimate.
(b) Foundation hatcheries' sales records and informal estimates by major processors.
(c) Industry press and foundation hatcheries' estimates.
(d) Industry press estimates.
(e) South Australia Department of Agriculture estimate.
(f) Foundation hatcheries' sales records and Western Australia Department of Agriculture estimate.

TABLE 2

Broiler Chick Sales by Three N.S.W. Hatcheries: 1960-64

	1960-61	1961-62	1962-63	1963-64
	(m.)	(m.)	(m.)	(m.)
Hatchery A	1·40	2·47	5·40	7·25
B		2·58	5·73	7·44
C		0·85	2·95	3·69
Total	1·40	5·90	14·08	18·38

The auction system of meat chicken sales has, of course, greatly decreased in importance with the emergence of contract growing. This is illustrated in Figure 1 in which the index of number of meat chickens sold at auction in Sydney is shown against the auction price index for the period 1960-64. Trends for both prices and sales are downward, with the decline in sales being relatively greater. Also, under the auction system, there exists a pronounced seasonal pattern with price responding inversely to supply changes: a rise (fall) in poultry supply would result in a price fall (rise) of approximately one quarter that magnitude in price.[3]

It is likely that seasonal sales fluctuations of broilers grown under contract would be much less than poultry sold under the "free" system. Promotional activities of principle buyers are continued throughout the year; and the typically larger processing plants of integrated operators require relatively smooth commodity flow for most efficient plant operation. In addition the bulk of chickens sold under the auction system finds its way into butcher shops, delicatessens and catering firms, whereas the largest outlet for contract-grown broilers is to super-markets whose promotion is likely to be non-seasonal.

In Table 3 the liveweight prices received by a Sydney metropolitan grower, believed to be representative in that area with respect to marketing experience, are shown for the 1953-1965 period. For most of the

[3] The estimated auction supply regression for 1960-64 is $P = 7{\cdot}42\ S^{-0{\cdot}27}$.

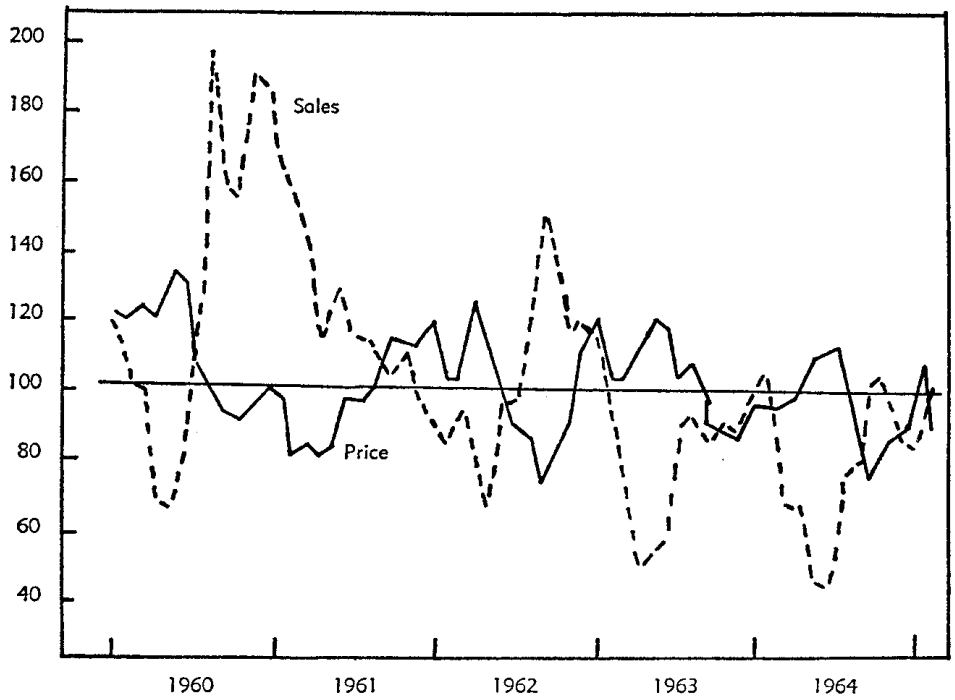

FIG. 1—Movement of sales and price indices for auctioned meat chickens. Sydney 1960-64. (Average 1960-64 = 100.)

period this grower operated under informal contract arrangements with medium-sized processors. The mean of wholesale prices received by two metropolitan processors is also shown for 1960-1965. The wholesale price trend is only an approximation: prices quoted are nominal in that they do not reveal discounts, negotiated special prices or promotional co-operation with super-markets and chain stores, all of which are important in this highly competitive business.

TABLE 3

Trend in Farm Liveweight and Processor Wholesale Broiler Prices, Sydney Area, 1953-1964

Year	Farm price cents per lb.	Wholesale price cents per lb.
1953	30	
1954	30	
1955	30	
1956	27	
1957	30	
1958	31	
1959	27	
1960	27	48
1961	25	45
1962	25	43
1963	24	40
1964	21	38
1965	22	38

Broiler Grower Contracts

It is not possible to ascertain with any accuracy the percentage of Australian broilers which are grown under contract but it appears to be about 85 to 90 per cent of the total. In country areas the percentage of total growers under some form of contract might be relatively higher because of the absence of alternative market outlets and processors equipped to accept unscheduled broiler deliveries.

The term contract is used loosely in the industry. It covers all types of grower-hatchery-processor arrangements ranging from verbal agreements to detailed documents, the acceptance of which some growers claim would reduce them to the status of "peasants". Arbitration on firm-grower differences arising out of contract interpretation is one of the advertised functions of the Chicken Meat Councils of the various States, but of the sample contracts available for examination only West Australian contracts make specific provision for arbitration.

Naturally, contract provisions differ according to whether the first party (the firm) is processor, feed merchant, hatchery, or performing more than one of these functions. Most so-called contract integrators in Australia have been basically hatcherymen.

The provisions of a typical broiler contract are summarized below. Such a contract has been accepted as something of a model and followed by other recently organized broiler firms in N.S.W. The contract is offered in two versions:

Type A: Growers are paid a rearing fee, e.g., 10 cents per bird grown to 70 days, with the grower's variable inputs limited to labour, brooding costs, power and water.

Type B: Growers are paid a price per lb. liveweight on truck delivered at the processing plant (e.g., 22 cents per lb.); grower price is determined at time of his ordering day-old chickens (or date of contract). Growers are committed to purchase all chicks and feed (and sometimes veterinary supplies) from the firm.

The provisions of these typical contracts are summarized below.

	Contract type A	Contract type B
Ownership of birds: retained by firm	Yes	Yes
Firm obligations:		
Provide: Chicks, feed	Yes	Yes
Medication	Yes	Yes
Servicemen	Yes	Yes
Transportation of chicks to farm	Yes	Yes
Transportation and labour for catching and trucking broilers to processing point	Yes	Yes
Grower Obligations:		
Provide: All growing labour and assist in catching and crating finished birds	Yes	No
Land, buildings and equipment	Yes	No
Water, power	Yes	No
Shed insurance	Yes	No
Maintain specified standards of hygiene	Yes	No
Keep batch records	Yes	Yes

Use exclusively the firm's chicks and feed	Yes	Yes
Follow instructions for disease control and medication	Yes	No
Exclude other poultry from farm	Yes	No
Allow firm's servicemen free access to broilers	Yes	Yes
Other Provisions:		
Profit sharing arrangement (grower efficiency incentive)	Yes[4]	No
Guaranteed payment to grower, regardless of batch results or prevailing market price	Yes	No
Guaranteed gross price to grower, per lb. liveweight on public weighbridge	No	Yes
Duration of contract: batch-to-batch	Yes	Yes
Renewal of contract: mutual consent	Yes	Yes
Provision for arbitration	Yes	Yes
Maximum time broilers are to be kept by grower specified	Yes	Yes
Market age determined by firm	Yes	Yes
Grower reimbursement of firm for advances on chicks, feed and medication in excess of gross value of finished birds	No	Yes

In areas where both types of contract are offered there is reported to be little difference between growers' economic results. One obvious advantage of the fee-type contract (*A* above) is that it frees growers from the direct consequences of unfavourable feed conversions, "bad lots" of chicks, and veterinary expenses. To counter possible grower irresponsibility the firm may offer an efficiency incentive on the following lines.

A grower price per lb. liveweight at weighbridge is specified and from this is deducted: (a) costs (borne by the firm) of chicks, feed and medication; and (b) grower's rearing fee. The balance, if positive, is divided equally between the firm and grower, and if negative, the "loss" is borne by the firm. Such "loss", however, would mean to the firm only that its total profit from co-ordinated operations as hatchery, feed merchant, processor, etc. would not be as great as it otherwise would be. In so far as the firm may supply all major inputs, whether there exists a surplus for bonus share-out with the farmer will depend on the firm's own previous factor-pricing polices, i.e. it can reduce to a book-keeping transaction among the several divisions of the firm.

One possible disadvantage of the rearing-fee contract is the elimination of choice of feeds and medication from the grower's decision-making sphere. For this to represent a real disadvantage would require that alternative feeds at competitive prices were in fact available, and that growers were technically competent to choose among such alternatives, and also able to develop their own diagnostic, sanitation, disease-prevention and general enterprise management programmes.

Implications of Contract Farming

The type of grower-firm contract relationship discussed above has important implications. These are briefly summarized below.

Farm Efficiency and Adjustment

While contracts might appear to offer some degree of farmer security, it is unlikely they will inhibit the general on-farm adjustment process. Indeed, adjustment forces may be stronger in contract situations; if greater grower efficiencies can be achieved it will usually be to the firm's

[4] This is not yet general practice in the industry.

advantage to force these farm changes into effect through the contract mechanism.

Development Capital and Production Credit

Certain forms of contracting offer alternatives to traditional sources for production credit and, to a lesser extent, development capital. As development loans arranged by or through contracting firms are self-liquidating, repayment risk is likely to be low. Similarly where production credit in the form of seed, feed, chickens, fertilizer, machine use, etc. is advanced, and the growing process is scheduled by the firm, the firm is in effect scheduling repayment of its own loans. From the grower's viewpoint, production and loan repayment are co-ordinated. An obvious danger to the grower exists where he has borrowed outside the contract framework and committed himself to an inflexible repayment programme. Loans made by suppliers of factors for capital items designed to benefit the supplier (through increasing factor demand, or decreasing handling cost, etc.) can, if repayment is scheduled to grower returns, also reduce grower income uncertainty—at least over the life of the loan. Here again the credit source is committed to ensuring that grower returns are sufficient for loan liquidation. It may do this by negotiating on the grower's behalf with a third party to purchase grower's output, or otherwise develop market outlets for growers.

Extension and Farm Management Research

To the extent that technical decision-making is centralized in contracting firms, official extension effort can be concentrated. Where decisions relating to types or quality of feed, planting dates, growing methods, etc. are not in fact made on the farm there is little point in aiming technical extension work at farm managers.

Farm management research, also, should to some extent be partially reorientated to the decision-making firm rather than the individual grower. The primary task of defining the relevant objective function will be at once more simple and more complex than on the individual farm level. On the one hand the objective may be more legitimately quantified in monetary terms, and the techniques of operations research more readily applied; while on the other hand the numerous profit-making avenues open to the firm will possibly tend to obscure that part of its operations relating directly to the primary production phase.