

# **Teagasc National Machinery Event 'Managing Machinery for Profit'**

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# **Labour Issues Affecting Agricultural Contractors**

*Tom Ryan and John McNamara, Teagasc, Kildalton College*

## **Introduction**

Agricultural contractors play a central role in Irish Agriculture. It is estimated that 80% of the heavily mechanised work, such as silage making, is done by contractors while the value of services provided is about £500m/year. Availability of skilled labour is a key requirement to running a successful contracting business. However, in recent years contractors generally have reported increasing difficulty in recruiting and retaining such staff due to competition from other sectors on the buoyant economy.

Accordingly, we decided to conduct a pilot survey of contractors (27) in the South East to obtain information on the current situation regarding labour availability and to provide a basis for discussion among contractors, farmers and relevant agencies to redress the problem of labour shortage.

We would like to acknowledge the considerable assistance of the Professional Contractors Association and the contractors interviewed for their assistance in conducting the survey. We appreciate that considerable variation in the nature and scale of contracting businesses occurs throughout the country. What we hope to do is to highlight some of the key labour issues affecting contractors generally and suggest possible solutions.

## Changes in Structure of Irish Agriculture

As a background to the survey finding let us first look at the projections for farmer numbers, as published in the recent Agri Food 2010 Report (DAFRD).

**Table 1**

	<b>1998</b>	<b>2010*</b>
Viable Full Time Farms	44,300	20,000
Part Time	38,500	60,000
Transitional (Non Viable)	63,500	20,000
<b>Total</b>	<b>146,300</b>	<b>100,000</b>

\* Policy change scenario (EU enlargement/W.T.O. agreements)

While these figures are tentative estimates, they show that there will be considerably less (and larger) full-time farmers. A considerable increase in part-time farming will occur. These will be either available for part-time work in the agricultural sector, including contracting, or in non-farming occupations. Also, this group are likely to require an increased usage of agricultural contracting services.

## Contractor Profile in Survey

It can be seen from Table 2 that 92% of contractors surveyed were involved in silage making with the majority having self propelled machines (60%) while 70% were involved in a substantial way in tillage. A number of one person contractor operations doing work such as baling/slurry/hedge-cutting/spraying, were surveyed also.

**Table 2 - Contractor Profile**

	<b>%</b>	<b>Acres</b>
Silage	92	2004
Tillage	70	918

## **Labour Used by Contractors**

The information collected on labour used by contractors shows (Table 3) that on average 1.4 family members, including the contractor, work full-time in the business. While the number of full-time and casual employees are 2.3 and 4.3 on average, respectively. Also, the contractors spouse is frequently involved in the business typically doing records, invoicing and money collection.

**Table 3 - Labour Available at Peak**

	<b>Contractor/Family</b>	<b>Fulltime Employees</b>	<b>Casual</b>
Average	1.4	2.3	4.3
Range	1-4	0-15	0-20

We found a significant level of co-operation among contractors with 33% sharing work with other contractors in busy periods. Also, significantly, 44% of contractors hire in both labour and machinery from farmers at peak times and for long draws to supplement their own resources (Figure 1).

## **Pay/Time Worked**

The predominant payment system was a flat hourly rate with the average net wages in the £4.5 - £5.5/hour range. Key staff such as foremen and experienced operators are receiving up to £7.00/hour net. The normal working day is 8 to 6p.m. but during peak times considerably longer hours are worked with 71% working 12-16 hours/day and 22% working over 16 hours/day (Figure 2). During slack periods time off arrangement/short days are generally available.

## **Labour Availability**

Over 80% of contractors surveyed reported having a major problem with availability of labour. Permanent staff are crucial to running a successful business. Contractors noted that younger staff in particular are more inclined to leave. The principal reasons for leaving are pay levels and long working hours. Contractors also reported an extreme shortage of casual staff for peak work, such as silage. From our survey (Figure 3) the predominant means of recruiting staff has been through "local contacts". While this has been a successful means of recruitment until recently, it is not likely to be as successful into the future. It is notable also, that the number of school leavers is dropping at the rate of almost 2% per year so that this source of casual labour will become less available over time.

As shown on Table 1, there is still a considerable labour pool available in the farming sector, the challenge now must be to harness this resource. A network system whereby this labour resource is released for contracting/machinery work needs to be developed. It is notable that the Professional Contractor Association and the Farm Relief Service have been having discussions on this problem recently. Also, improved labour efficiency on farms should assist in the process of making more labour available.

## **Working Conditions**

While pay and hours of work are the most crucial factors in retaining staff, the importance of good working conditions cannot be overlooked. Chief among these is the quality and condition of the machinery used. By and large we found a strong commitment to having up-to-date equipment from the point of view of having increased reliability and less downtime and a better working environment. It is notable that 23% of the tractors in the survey were less than 2 years old (Figure 4) while over half the tractors were less than 6 years old. This is an indication that contractors

are committed to providing good quality working conditions to their staff as well as a quality service to their customers.

In the survey also we looked at working conditions such as meals provided, transport, accommodation, toilets/washing facilities, and First Aid as shown in Figure 5. Over 74% of contractors reported an arrangement for providing meals. However, while 85% of contractors had a first aid box available, only one contractor had received training in First Aid. As the majority of employees were from the locality, transport and accommodation are not major issues to the same extent if they were working in industry or away from home.

## **Time Management by Contractors**

It can be seen from the survey (Figure 6) that the major proportion of a contractors time is spent operating equipment, followed by managing the business and repairing/maintaining machinery. The scale of the business determines the time spent at each function. As scale increases more time needs to be allocated to managing the business. Many contractors are committed to an effective replacement policy to reduce breakdowns and downtime. The survey shows (Figure 7) that a considerable administrative workload is borne by contractors/contractors family in invoicing, money collection and accounts. Accountants are employed in all cases to finalise tax returns.

## **Training Issues**

Teagasc sees training as an essential requirement for any young persons wishing to pursue a career in the machinery sector. The recent reorganisation of Teagasc training programmes has led to the availability of specialised training options. Such specialised options are available in

farm mechanisation at certificate level (NCVA/NCEA) for persons interested in working with farm machinery.

An extension of machinery training facilities is being undertaken at Kildalton College. Teagasc plans to make these facilities available for training of contractors and their operatives. Courses to be developed will include:

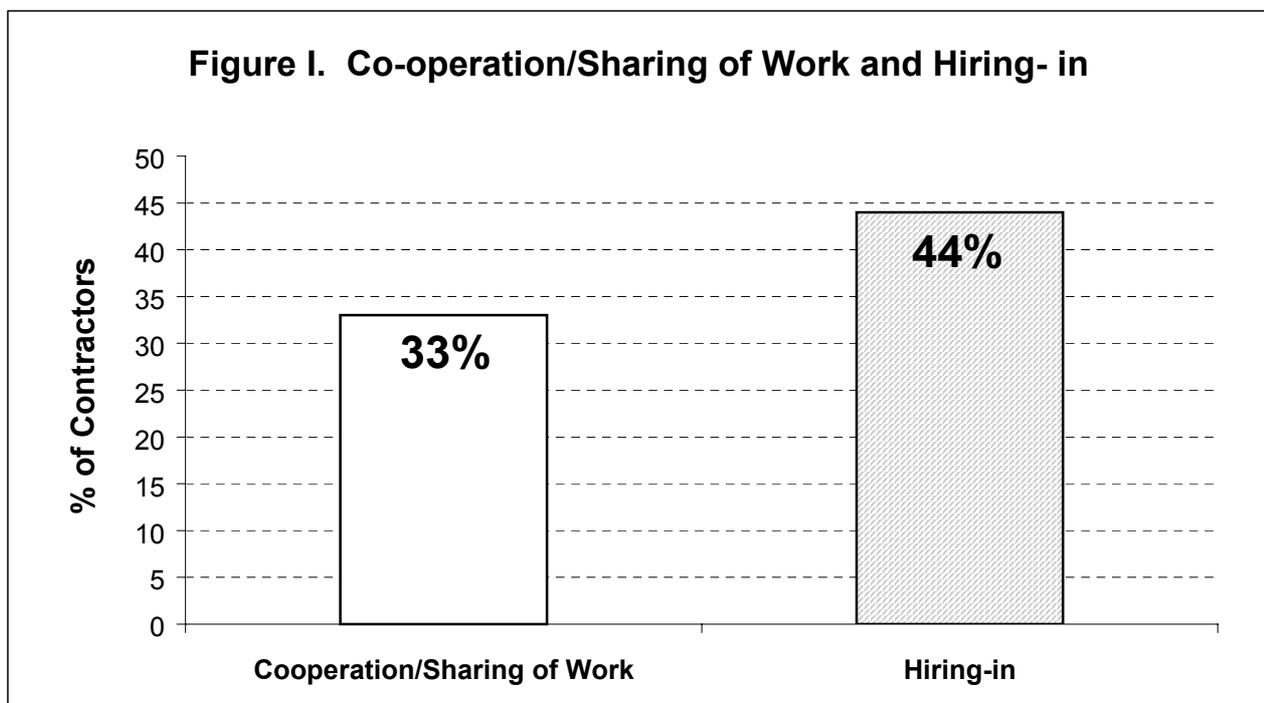
- Safety Management
- Machinery specific courses in conjunction with the trade
- Pesticide Application
- Business Management / Computer Applications

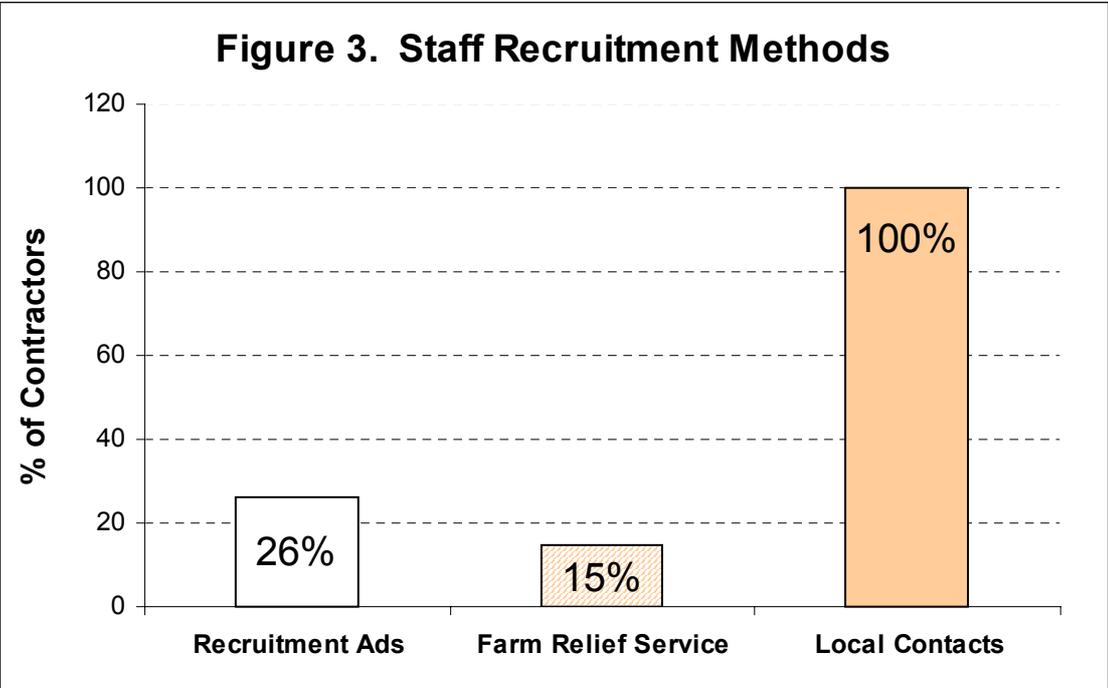
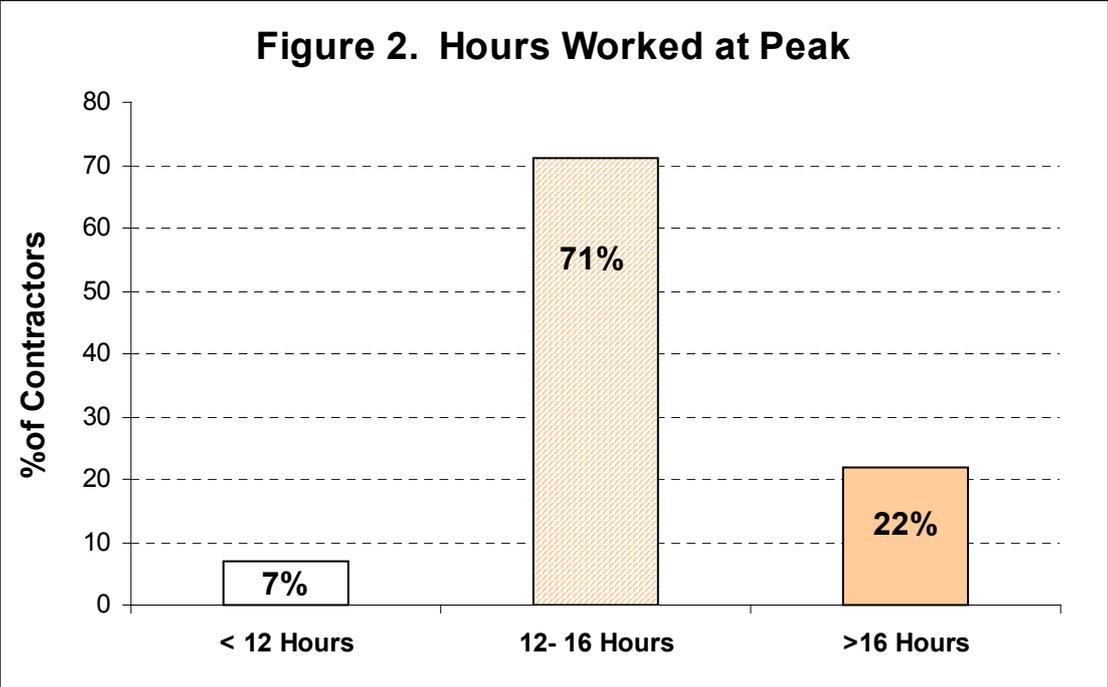
## **Conclusions**

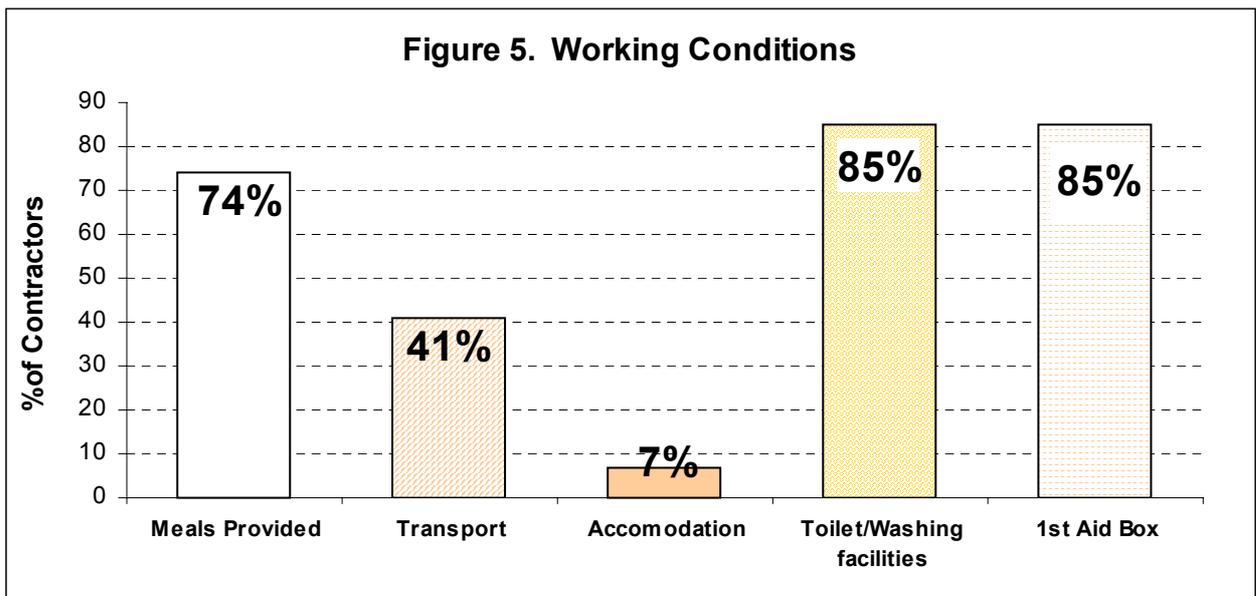
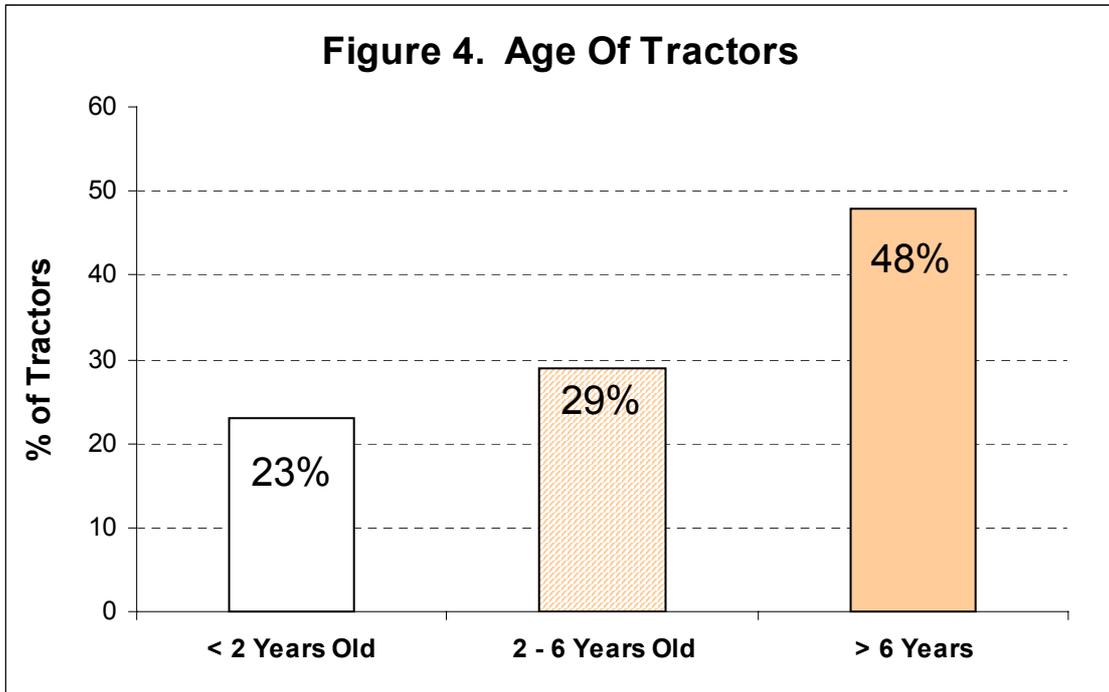
- Pay rates will have to be competitive to attract and retain high calibre staff into the contracting sector. Such staff will need to be superb machinery operators, and have good communications skills to work with farmer clients.
- Working conditions also, will be crucial to retain staff. Principal among these includes availability of up-to-date modern equipment and minimisation of long hours to the peak season and in adverse weather conditions.
- Machinery scale and technical improvements have a role to play in reducing labour requirements, e.g. In line wrapping / bigger silage trailers.
- A considerable pool of skilled labour exists in the contracting sector already. The challenge to retain these and make the job more attractive in relation to other sources of employment.
- There is a considerable pool of labour available on farms which could be available for machinery operations with contractors, as the trend toward part-time farming increases.

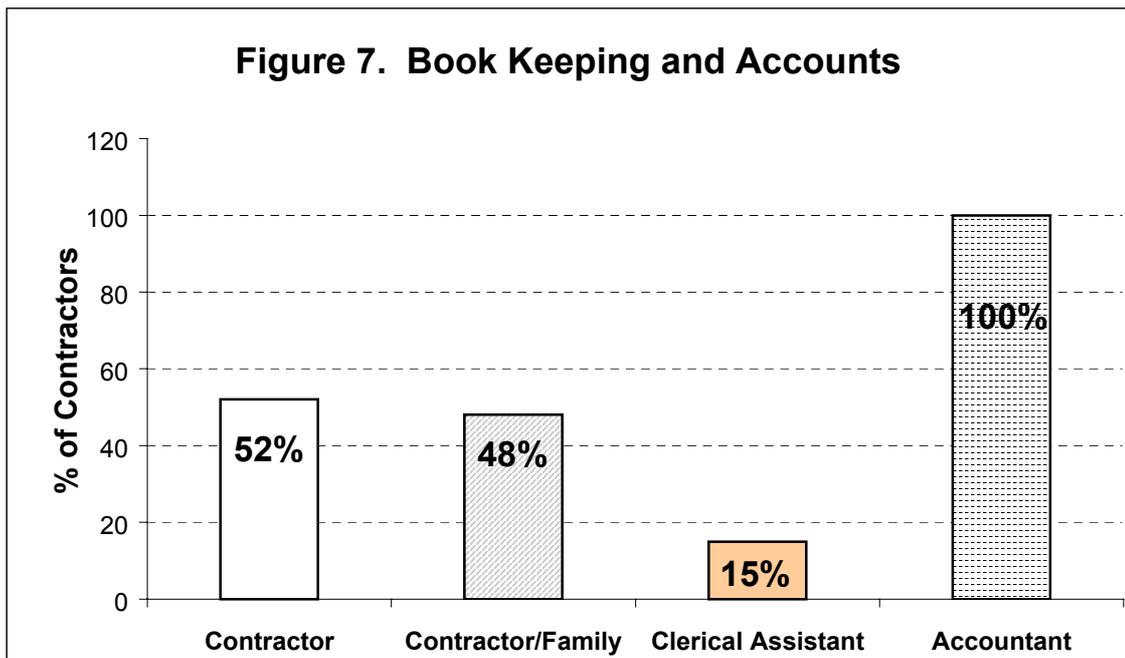
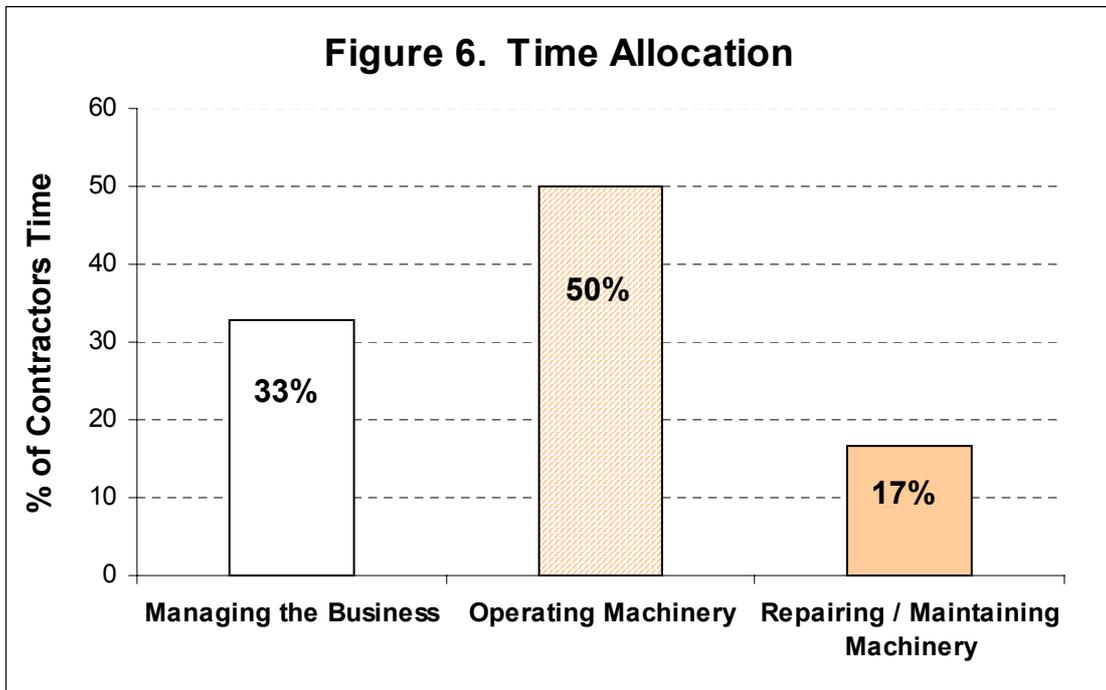
- Hiring in of both operator with his own tractor/machines is likely to increase and will provide a very suitable source of labour for contractors.
- Co-operation and sharing of work can overcome some of the problems of labour shortage.
- As recruitment at local level is getting more difficult, there is a role for recruitment agencies, such as the F.R.S. to identify suitable persons for machinery operation.
- Working with modern machinery has many advantages. These should be promoted actively to attractive high calibre persons into the business.

Farmers should realise the value and service provided by contractors and their operators. A good working relationship with contractors will be crucial to the long-term viability of farming into the future.









# **Machinery Costs and Mechanisation Supply**

*Dermot Forristal, Teagasc, Crops Research Centre, Carlow*

## **Mechanisation as an Input**

Mechanisation is a key input in all agricultural production systems. Like any other input, there are costs and benefits associated with the use of machinery. Unlike most other farm inputs, however, these costs and benefits are very difficult to quantify. Costing is made difficult by the need to predict depreciation and repair costs over the full life of a machine. Equally, it is difficult to attribute a monetary value to many of the benefits that machinery brings, such as improvements in timeliness, labour reduction, health and safety benefits etc.

It is important to acknowledge the role that mechanisation has, and continues to play, in agricultural development. Developments in mechanisation more than any other input are responsible for the type and scale of production systems that we have. Improved quality of work, timeliness of operation and, most importantly, the ability of a relatively small labour input to manage and operate quite large enterprises, are all attributable to mechanisation.

## **Spend on Mechanisation**

The amount of money spent annually on machinery is considerable. The Teagasc National Farm Survey records farm expenditure on a sample of approximately 1,100 farms each year. The average farm expenditure on machinery was £4,250 in 1998, representing 22% of all farm costs (direct and overhead). This amounts to approximately £546M for all farms in the country. On tillage farms, the average annual expenditure on machinery

was £11,142, representing 32% of all costs excluding land rental. This equates to £204/ha annually, which corresponds to the £194/ha recorded over a three-year detailed survey carried out on 40 farms between 1991 and 1994 at Oak Park Research Centre. These costs do not include labour associated with machinery use. On individual farms, the level of expenditure will vary. The Oak Park cost survey recorded a range of costs from £93 to £340/ha. While it is incorrect to assume that the lowest cost is the best, these figures stress the importance of mechanisation as an input.

### **Factors Influencing Future Mechanisation Supply**

The importance of mechanisation as an input is unlikely to change. There are many factors which will influence the type of machinery that is used and the method by which it is employed on farms, such as self-ownership, contractor use, partnership etc. Ultimately, cost-benefit analysis should determine what system is used, but it is important to identify the factors that influence trends in mechanisation to ensure that viable options will be available in the future.

### **Decreasing Margins**

All main farming enterprises are facing reducing output prices in the medium to long term. This will force growers to examine all production costs including machinery. Reducing margins will also influence the future structure of farms with a smaller number of intensive full-time farms and a greater number of part-time farms. This will have implications for mechanisation choices.

### **Developments in Machinery**

Machines and mechanisation systems continue to evolve. Occasionally it is thought that a particular machine or system has reached the end of its development. In the 1990s, for example, most tillage farmers and

contractors considered the 4-furrow reversible plough and 3 m one-pass cultivator/drill to be the ideal crop establishment system. Now many are seeking more labour efficient alternatives. Machine development will continue both in the area of scale (machinery size) and technology. These developments offer the potential of improved work quality and/or reduced production costs but lower costs are only possible if these machines are worked over sufficiently large areas.

### **Labour Supply**

Labour availability for agricultural operations has changed dramatically, with other sectors competing for paid labour and also attracting many farmers own labour. This has consequences for machinery use on farms, as in the past many farmers either relied on their own labour to maintain/operate older machines or relied on a readily available supply of casual labour to work machines at peak times. While contractors have similar problems, they generally have a more even distribution of labour demand.

### **Influence of Scale on Machinery Costs**

For most categories of machines, an increase in scale usually results in potentially reduced costs provided there is a pro-rata increase in the quantity of work carried out by the machine. There are many reasons for this. The biggest factor is often labour cost. The greater the workrate of an individual machine, the lower the labour cost per unit area. For example, a combine with a 5 acre/hour capacity will have 50% of the labour costs per acre of a combine with a 2.5 acre/hour output. The machine purchase price per unit of capacity may also be less expensive. However, there are many exceptions to this rule. Draught cultivation equipment, for example, can often be more expensive per metre of working width for a wider machine, as the frame costs to cope with the extra power input increase disproportionately with machine width.

The general trend of decreasing costs with increasing scale is illustrated in Table 1 where two different combines are costed using the Oak Park costing program. A number of assumptions are made here. Repair costs are assumed to be related to the original machine purchase price. Increasing scale reduces the labour cost element substantially. The influence of labour demand on mechanisation decisions is even greater than just a cost element as the unavailability of labour may dictate certain choices.

**Table 1 - The effect of scale on combine costs**

	<b>4-shaker basic spec.</b>	<b>6-shaker mid. spec.</b>
Purchase price (£)	80,000	140,000
Replacement age (yr)	8	8
Annual use (ha)	200	400
Machine cost (£)	10,208	17,864
Machine cost/ha (£)	51.04	44.66
Fuel/ha (£)	5.80	4.69
Labour/ha (£)	6.66	3.33
<b>Total/ha (£)</b>	<b>63.50</b>	<b>52.68</b>

In the past, smaller- and medium-sized operators could match the cost saving benefits of scale by using second-hand machines and/or long machine replacement life. This can still be the case, but the unavailability or opportunity cost of labour, to operate and inexpensively maintain these machines makes this a less attractive option today.

### **Methods of Achieving Scale**

How can the advantages of scale be gained on individual farms? There are a number of options:

- Purchase land
- Rent land (con-acre or long-term)
- Farm partnerships: for all farming practices or machinery
- Use contractors/machinery rings

All of these options allow high-capacity machines to be operated over larger areas, but there are many other factors that determine the viability of each option. Land purchase is the least accessible option for most. Short-term rental is the most used option in the tillage sector. The rents paid usually result in the net margin being equivalent to the economies-of-scale benefit in machinery use, i.e. the normal production margin is used to pay the rental. Farm partnerships are a viable option, particularly where the partners want to maintain a level of involvement in the farming operation. There are many different types of possible partnerships, all of which offer the potential to reduce machinery costs. The most commonly used method of achieving economies of scale in Ireland is to employ contractors. Contracting simplifies organisation and solves both mechanisation and labour supply problems. They are the primary source of mechanisation supply on grassland farms. On tillage farms, they supply a significant level of service, but because of the central role that mechanisation plays in tillage operations and the ability to rent additional land, farmers often prefer to retain the machinery operations. Machinery rings are simply an alternative method of supplying contracting services.

The central co-ordination of services embodied in the ring system facilitates the supply of individual machines and labour units as a source of mechanisation supply.

There is little doubt that the use of contractors to provide mechanisation services is a cost-effective and sensible solution to machinery supply for a large number of farms. However, a more managed approach to contracting is necessary to ensure a stable supply of economic services to the farmer and a sustainable level of work and income for the contractor. Improved management must include accurate machine and operation costings, good pricing systems and better planning of services between the farmer and contractor.

## **Machinery Costing**

Whatever method is used to supply mechanisation, accurate costing is necessary. A farmer with his own land and own machines needs machinery cost information for management purposes. For land rental, accurate machinery costings are essential to determine economically viable rent levels. Partnerships could not function without accurate machine costs to determine the value of individual machinery operations. Contracting cannot survive without accurate costing.

### **Machine Costing and Job Costing**

To accurately cost any machine, it is necessary to attribute all the costs associated with its use to the job being carried out. Costs associated with machinery use can be divided into four categories: machine costs, labour costs, fuel costs and overhead costs.

#### *Machine Costs*

Machine costs include depreciation, interest and repairs and maintenance. Estimating these costs is difficult as the proportion and level of these costs vary during the lifetime of the machine. In many situations, the depreciation and interest component is paid for in the finance payment. However, this may not be an accurate reflection of the true costs if the machine is owned for a longer period than its finance term and/or the residual value of the machine at trade-in is different in real terms from the value of the original trade-in. Similarly, repairs and maintenance costs are difficult to predict because of their variable nature and the tendency of the costs to increase over the lifetime of a machine. Despite the difficulties associated with calculating depreciation, interest and repairs, estimates must be made to determine the profitability of an individual operation and to arrive at a proper pricing structure for the job.

Where the facilities of the business are being used to maintain and service machinery, these should be costed (building, equipment and labour) and apportioned to individual machines where possible. Other costs that should be apportioned to machines include insurance and tax.

#### *Fuel Costs*

Fuel should be attributed to specific operations. The importance of fuel depends on its price. Accurate record keeping would facilitate this.

#### *Overhead Costs*

A contracting business can have significant overhead costs which can be difficult to assign to particular machines. These include office costs, transport costs and machine storage/workshop facilities. Other costs that should be considered include training, visits to conferences, meetings etc. All overhead costs should be assigned arbitrarily to individual operations.

### **Operation Costing Example**

The one-pass cultivation/sowing operation is used as a costing example, as it includes tractor costs that must be calculated and attributed on an hourly basis, and machine costs which are assigned on an area basis. The machine costs for tractor and one-pass unit are given in Table 2. Prices in this example exclude VAT. The 95 kW tractor is costed at a use rate of 1000 hr/year. Depreciation and interest costs are based on age and use rate and are determined by the Oak Park costing program. The one-pass is replaced at 5 years with an annual use level of 300 ha.

The second part of the costing exercise outlined in Table 3 allocates fuel and labour costs to the tractor. A charge for road transport (assuming 20% of the total time is spent between working sites) is added at this stage to give a tractor and labour cost for each hour worked in the field.

The final part of the costing is to convert the tractor hourly cost to a per-ha cost and to add the one-pass costs, other overhead costs and a profit margin. If all the cost and workrate estimates are accurate, the net margin and necessary price should be realistic.

**Table 2 - Machine costs – 95 kW tractor (8-year life), 3 m one-pass (5-year life)**

**(1) Machine Costs**

	<b>95 kW tractor (£)</b>	<b>3 m one- pass (£)</b>
List price	50,000	22,000
Cost price	40,000	17,600
Residual value	11,340	6,487
Depreciation	3,582	2,223
Interest	1,400	933
Repairs	1,553	1,615
Insurance	800	-
<b>Total annual cost</b>	<b>7,335</b>	<b>4,771</b>
<b>Cost/hr (1,000 hr/yr)</b>	<b>7.33</b>	
<b>Cost/ha (300 ha/yr)</b>		<b>15.90</b>

**Table 3 - Tractor, Fuel and Labour Costs**

	<b>£</b>
Tractor cost/hr	7.33
Fuel cost/hr	5.50
Labour cost/hr	7.00
	<hr/> 19.83
Surcharge for 20% time at transport (£16.00/hr transport x 20%)	3.20
<b>Tractor costs/hr</b>	<hr/> <b>23.03</b>

**Table 4 - Complete Operation Costs**

System workrate: 1.3 ha/hr (3.25 ac/hr)

	<b>£</b>	
Tractor cost/ha	17.72	
One-pass cost/ha	15.90	
Overhead costs (10% machine costs)	3.19	
Profit margin	5.00	
<b>Price</b>	<b>41.81/ha</b>	<b>+ VAT</b>

Opportunities to reduce costs in this example are highlighted in Table 5.

**Table 5 - Possible Cost Reduction Options**

	<b>Cost reduction (£/ha)</b>
1. Improved tractor fuel consumption (15%)	0.63
2. Extra tractor utilisation (1500 hr/yr)	1.35
3. Reduced repair cost estimates (30%)	2.17
4. Improved workrate (20%)	6.00

These options may not be available in every situation. Using a tractor with improved fuel consumption has a relatively small influence on costs, although at current prices fuel consumption is certainly worth considering when replacing a tractor. Increasing the annual use rate of the tractor would reduce the hourly cost quite significantly, with a consequent reduction in per-hectare costs. The repair cost reduction option may not be achievable in practice, although the repairs estimates produced by the Oak Park cost program tend to overstate costs. The final option of increasing workrate has the biggest impact on costs, as it effectively reduces all the cost elements, including labour. Note that this option assumes all the machine costs remain at the same level. It doesn't allow for increased wear and tear by forcing more work from the machine. Workrate could be increased by having better work practices in the field, working at a shallower depth or by having consolidated or more weathered ploughed soil to work on.

The practice of job costing is essential to identify the operations that are profitable and those which need attention either by reducing costs or increasing the charge. The costing process is not easy and the result is only as good as the figures which are inputted.

## **Charging Systems**

Devising equitable and appropriate charging systems for machinery operations can be difficult. The charge arrived at in Table 4 is correctly based on machine costs, but is the area-based charge the best method? There are many factors which influence operating costs in the field. These include: soil type and condition; field size/shape; distance to travel to field etc. Harvesting costs are significantly influenced by the yield of the crop being cut. A charging system should reflect the costs of the operation, but must also be transparent to the customer and be relatively simple to operate. The area-based charge is a good compromise in most situations. It usually is the best single measure of the work done. However, it fails to take into account factors which influence the workrate, such as crop yield, difficult soils, haulage distance for grass etc. The argument is often made for per-hour charging, but this system, while good if operated fairly by an individual contractor, is unacceptable to the customer for most operations. It does not allow comparison between different systems (i.e. different contractors would have different workrates) and is not necessarily based on the amount of work done. Time-based charging is only used where there is no other descriptor of the work to be done, e.g. digger hire or tractor/trailer hire etc.

The area-based charging system can be improved on. For grass harvesting, for example, a charge based on area and yield would be more equitable. Although this partly exists with second-cuts, if it was introduced for first cut, it would contribute to a greater spread in the length of harvest and it would make more second-cuts attractive. One of

the main attractions of baled silage is that it is charged for on a per-bale basis. Research at Oak Park has shown that on-harvester yield measurement of grass is possible. Many of the forage harvester manufacturers are currently developing grass yield sensing equipment which would be the ideal basis for a better silage harvesting charge. Instead of £60/ac, a more equitable charge may be £25/ac + £2.50/t. In the meantime, a more formal date-dependent cutting charge, where later first cuts would attract an extra charge, would have merits.

### **Marginal-Cost Charging**

The argument is often made that extra work can be carried out for the marginal costs of doing that work, e.g. an extra job is profitable if the labour and running costs of the machine are covered. There are potential pit falls with this approach. The marginal costs are often greater than realised. Most of the costs incurred by a contractor are directly related to the work being done. Labour, fuel, and repairs and maintenance costs are attracted at the same level as the core work. In many cases, machine depreciation is also increased. The residual value of a self-propelled forage harvester is dependent on its condition and the amount of work done rather than its age, for example.

However, there is merit in using an element of the marginal cost approach to attract out-of-season work, where the customer has the choice of taking this option. Discounts for early-season grass harvesting or using a 2-cut system rather than a single cut, for example. Similarly, attractive rates for cultivation/sowing and harvesting of winter barley, when equipment may otherwise be idle, can also be sensible. It is important that this approach is only used to attract additional out-of-season work that all customers have an option of providing. It should not be used to attract additional customers at a low price during the core working period. This is not equitable and will alienate existing customers.

## **Conclusions**

1. Mechanisation is a key input in modern agriculture that accounts for significant costs and brings considerable benefits.
2. Decreasing farm margins, labour shortages and developments in mechanisation will influence future mechanisation supply.
3. The need to pursue economies-of-scale in machinery use will ensure a continuing demand for contractor services and other systems which impact on machinery use, such as partnerships etc.
4. Estimation of machinery costs is essential to ensure competitive production at farm level and to ensure viability in a contracting operation.
5. A job costing approach is essential for contractors to identify operations where change is necessary.
6. Contracting charging systems could be improved to reflect costs more accurately and to attract out-of-season work.

## **Financing and Taxation Aspects of Machinery Investment**

***John Norris - Farm Management Specialist - Kildalton***

### **Introduction**

This paper examines machinery investment on Irish Farms, the cost of finance, various financing options and the taxation aspects. A number of examples help to illustrate these factors in more detail and how they interact. Contractors and farmers should discuss these factors with their own accountant when planning new investment.

## Investment in Agriculture

Investment in Agriculture has been at record levels in recent years. Gross fixed capital formation in Agriculture in the five year period 1995 to 1999 reached a total of £2961 million or an average of £592 million per year which averages 30.7% of total farm income over the period. A breakdown of gross investment by category of investment is shown in Table 1.

**Table 1 - Summary of Gross Fixed Capital Formation in Agriculture at Current Prices and exclusive of Deductible VAT (1995 to 1999)**

**(Current Prices in £000s)**

	<b>Farm Buildings</b>	<b>Land Improvements</b>	<b>Transport Equipment</b>	<b>Agricultural Machinery &amp; Equipment</b>	<b>Other Equipment</b>	<b>Breeding Stock</b>	<b>Total</b>
1995	133,821	10,004	142,971	182,173	48,685	53,054	570,707
1996	212,392	15,877	154,269	183,616	26,850	58,564	651,569
1997	175,505	13,120	177,898	173,733	31,774	57,444	629,474
1998	135,144	10,102	181,117	197,343	47,734	-1,104	570,336
1999	102,888	7,691	187,405	224,601	57,325	-41,074	538,836
Total	759,750	56,794	843,660	961,466	212,368	126,884	2,960,922
Average Per Year	151,950	11,358	168,732	192,293	42,473	25,376	592,184

Source - Central Statistics Office - October 2000

### Notes

1. Agricultural Machinery and Equipment is that used by farmers and includes Agricultural tractors.
2. Transport equipment includes motor cars, other vehicles and commercial vehicles.
3. Other equipment includes all other types of equipment, for example fencing products, hardware, tools, drills etc.

Investment in Agricultural Machinery and Equipment over the period has varied from £174 million in 1997 to a high of £225 million in 1999 and averaged 32.5% of total new investment over the 5 year period. Farmers also invest substantially in transport and other equipment. Whilst precise figures are difficult to obtain some estimates indicate that about 80% of this investment is financed by Farm Loans, Hire Purchase and Leasing with the balance of 20% from Cash Flow. Farm Incomes peaked in 1996 and have been dropping up to 1999 but are expected to show a useful recovery in 2000. Table 2 shows Farm incomes over the last 5 years.

**Table 2 - Irish Farm Incomes (1995 to 1999)**

<b>(£ Million)</b>	
1995	£2075 Million
1996	£2092 Million
1997	£1962 Million
1998	£1866 Million
1999	£1637 Million

*Source: Central Statistics Office*

## **The Cost of Finance**

Some estimates indicate that up to 80% of the new investment in machinery must be borrowed or financed from outside the business in the form of Loans, Leases and Hire Purchase. The remainder comes from cashflow or own resources. The cost of this money is important.

On joining the EURO Ireland became part of the Bigger Eurozone and hopefully a more stable interest rate zone for the long term. However, interest rates have increased by 1.75% to 2% in the past year. Quoted interest rates from the main financial institutions for Business Customers (Category AA) in early November are outlined in Table 3.

**Table 3 - Range in quoted Interest Rates by the main financial institutions for Business Customers (AA) in early November 2000**

• Mortgage Rates	= 5.0% to 6.8%
• Overdrafts	= 9.9% to 10.25%
• Seasonal Loans (under 1 year)	= 8.9% to 9.6%
• Term Loans (1 to 3 years)	= 8.75% to 9.5%
• Term Loans (4 to 5 years)	= 9.1% to 9.5%
• Term Loans (6 to 7 years)	= 9.55% to 9.7%
Term Loans (7 years and over)	= 9.7% to 10.5%

Interest rates are lower for "Market Related Borrowing" based on "EURIBOR" interest rates. This is the wholesale price for inter-bank lending to which the bank adds its margin of 2% to 3%. An example of Market Related Borrowing fixed interest rates in mid October 2000 with a margin of 2% added for the bank is shown in Table 4.

**Table 4 - Example of 'Market Related Borrowing' Fixed Interest Rates (at mid-October 2000)**

<b>Period of Fixing</b>	<b>Euribor Rate</b>	<b>Add Bank Margin</b>	<b>Total Fixed Rate</b>
1 month	4.87%	2.0%	6.87%
1 year	5.19%	2.0%	7.19%
2 years	5.23%	2.0%	7.23%
4 years	5.38%	2.0%	7.38%
7 years	5.60%	2.0%	7.60%

The bank margin can vary between 2.0 and 3.0% and some borrowers may negotiate a margin less than 2%. Predictions indicate that interest rates may increase by 0.25% to 0.75% to a peak in Spring 2001 and hopefully start to reduce thereafter.

Hire purchase and leasing is widely used to finance agricultural machinery. At present the interest rates quoted by the main financial institutions range in Annual Percentage Rate (A.P.R.%) from 7.9% to 9.65%. When comparing the cost of finance between different financial

institutions always ask for the Annual Percentage Rate (A.P.R.) of interest. This is the only true comparison of interest rates as it takes account of the different ways the interest rate may be calculated and the effect of fees and charges. The range in quoted repayment rates per £1000 for various periods and repayment schedules is shown in Table 5.

**Table 5 - Range in Payments (£ per £1000 Financed) for Hire Purchase and Lease Agreements (early November 2000)**

		<b>3 Years</b>	<b>4 Years</b>	<b>5 Years</b>
Monthly	In Advance	31.01 - 31.97	24.36 - 25.12	20.44 - 21.04
	In Arrears	31.22 - 31.77	24.53 - 24.88	20.64 - 20.83
Quarterly (every 3 months)	In Advance	92.47 - 93.56	72.40 - 73.11	59.90 - 61.02
	In Arrears	94.27 - 96.20	74.10 - 75.09	61.50 - 62.85
Half Yearly (every 6 months)	In Advance	183.16 - 185.11	142.60 - 144.64	118.00 - 120.72
	In Arrears	190.38 - 194.50	149.74 - 151.92	124.50 - 127.14
Annual (every year)	In Advance	359.35 - 362.47	281.63 - 283.22	235.92 - 236.26
	In Arrears	388.17 - 396.85	305.76 - 310.78	257.76 - 260.25

The figures in Table 5 are a sample and there may be some finance companies with quoted rates higher or lower than shown. There will also be some scope for negotiation on the rates shown based on a number of factors such as the financial strength and previous credit history of the customer, size of loan, period of loan, type of equipment involved etc.

Some machinery manufacturers offer special low cost subsidised finance packages. For example, one manufacturer offers zero % finance over 2-3 years on 60% of the list price. Another manufacturer offers 3 years finance at 4.0% APR, 4 years at 5.2% APR and 5 years at 5.75% APR. These schemes can vary from time to time and apply to certain ranges of equipment. The interest rate on Hire Purchase and Leasing agreements is usually fixed at the start for the full period. Bank Term Loans may have fixed or variable interest rates. As shown in Table 5, there is a wide

variety of repayment schedules to suit the cash flow situation for different farms. Machines are getting bigger and more sophisticated and expensive over time.

## **The Taxation Factor**

The taxation factor is very important in relation to machinery investment and financing and a number of aspects need to be considered as follows:

### **a) VAT Status of Farmer**

Most Irish grassland/livestock farmers are not registered for VAT (Value Added Tax) and are known as "Flat Rate Farmers". They cannot reclaim VAT on machinery purchased by Term Loan or Hire Purchase or on Lease payments. Compensation for VAT incurred is by the addition of the flat rate refund of 4.2% to their sales of farm produce.

Contractors and most larger farmers are normally registered for VAT and they can claim back the VAT up front on machinery purchased by Term Loan or Hire purchase agreement. The VAT portion of each lease payment is claimed back after each lease payment is made.

### **b) Capital Allowances**

All machinery and plant purchased after the 5th April 1992 qualifies for Capital Allowances (Wear and Tear Allowances) offset against taxable profits at the rate of 15% per year for first six years and the final 10% in year seven. The machine is written down to Nil Value on a straight flat rate basis over a seven year period. Capital Allowances apply to the net cost of the machine (gross cost less any VAT refund and less any grant). Prior to April 1992 a system of additional or free depreciation allowances was available but this was abolished. The capital allowances apply to owned machinery purchased by term loan and also Hire Purchase agreements. For leased machinery, capital

allowances do not apply but the full lease payments are allowed against taxable income for flat rate farmers. Farmers registered for VAT can reclaim the VAT element after each lease payment is made. Full tax relief is available on the interest costs charged on Term Loans and Hire Purchase Agreements.

### **c) The Tax Rates**

In the 2000/01 Tax year, farmers on the high tax rate save 44% of the value of capital allowances, interest payments and leases, while farmers on the low tax rate save 22%. In addition there can be savings of 5% PRSI when the allowances bring profits under £26,500 and savings of 2% for the Health Levy once taxable income does not drop under £14,560. Over the next few years as income tax bands increase and tax rates drop, the potential tax savings on both existing and new machinery investment will drop also.

## **Notes on the Main Funding Options to Finance the Purchase of Agricultural Machinery**

### **a) Own Cash and Term Loans**

Buying machinery directly with own cash, term loans or combination of both gives immediate ownership of the machine. Loan repayments can be flexible to suit cash flow and the seasonal nature of farm income. The term loan can have variable rate or fixed rate interest. Capital allowances and loan interest is claimable against tax.

There is no VAT charged on the Term loan interest. A bank will not normally advance the full cost of a new machine where financing is through a term loan. The farmer may be asked to fund part of the cost from his own resources, for example trade-in or cash. Most banks

will normally require some form of security for a loan advance. If the farmer is an existing customer of the bank they may already hold his farm deeds which may be adequate for the additional amount being borrowed. Normally the bank will not take a specific charge, or lien, on the actual machine being purchased.

If the machine is sold or traded in before the full capital allowances are claimed, and the price achieved is higher than its written down value (W.D.V.) then the excess value over W.D.V. is added to farm profits as a "balancing charge" and taxed. Alternatively, if a new machine is being purchased, its value can be reduced by the value of the balancing charge. If a machine is sold or traded-in at less than its written down value, a "balancing allowance" is granted and this is an expense for tax purposes.

#### **b) Hire Purchase (HP)**

In its simplest form, a hire purchase agreement provides for the hire of equipment by a customer (e.g. farmer) from a hirer (a bank) for a specific period and full outright ownership of the equipment passes from the hirer to the customer no later than the date of payment of the final sum due under the agreement. The regular HP rental payments are made over what is known as a primary period followed by the payment of one final sum known as the option payment. For tax purposes, the farmer is regarded as the legal owner of the asset from the start of the agreement and can claim tax relief on the capital allowances for the machine net cost and can also claim tax relief on the interest payments on the HP.

From a VAT perspective, the equipment dealer is deemed to supply the equipment not to the hirer, but directly to the hirer's customer. The flat rate farmer cannot claim back VAT on the machine but VAT registered farmers can. Interest under a hire purchase agreement is

exempt from VAT since the 1995 Finance Act so the hirer does not charge VAT on interest due on the HP agreement.

Finance companies will normally advance 100% of the cost of the machine financed by hire purchase.

### c) **Leasing**

A lease agreement provides for the hire of equipment by a customer from a lessor (the bank). Most farm machinery leases are called finance leases. The bank effectively purchases the equipment from the dealer and the farmer obtains the use of the leased asset by making fixed rental payments to the bank. Generally, lease agreements are comprised of two distinct periods:

1. **The Primary Lease Period** normally runs for 3 to 5 years and covers the full capital cost and interest payments for the equipment. The Revenue Commissioners require primary lease periods of a minimum of 3 years. The primary lease period gives bigger tax relief per year than that received over the seven year write off period for machinery owed on the HP. VAT paid on lease payments can be reclaimed by VAT registered farmers. VAT is charged at 21% on the Capital & Interest within the lease payment.
2. **The Secondary Lease Period** - At the end of the Primary Lease Period the farmer can continue to hire the asset by making nominal annual rental payments. The payment can be very small e.g. £20 to £50 per year or can be much higher at say 1% to 2% of the original equipment cost depending on the Finance company. Check this figure carefully when the lease is being set up. A high figure increases the cost of lease finance. The secondary leasing period can last up to year 6 and 7 and the leasing company still owns the equipment. The nominal lease payments provide small tax relief

during the secondary lease period. The taxation pitfalls will arise when the lease is terminated and depending on the option selected. There are various options as follows:

**Disposal of the Asset** - The lessee (farmer) acting as the agent of the lessor (Leasing Company) may dispose of the asset to an independent third party at market value. Up to say 98% of the surplus, after paying any outstanding lease rentals, is then returned to the farmer as rebate of lease payments already made and which have already received tax relief.

**Trade-In of the Asset** - The farmer, acting as agent for the leasing company may trade-in the equipment. Up to say 98% of the trade-in value is credited to the farmer as an advance rental on a new lease.

**Purchase of the Asset** - The farmer may not purchase the equipment from the leasing company. However, the leasing company can sell the goods to LEASED ASSET DISPOSALS LIMITED (L.A.D.S.). This company was established by the finance companies and approved by the Revenue Commissioners to facilitate a structured method for both parties to exit from leases. LADS acquires title and offers the equipment for sale to the farmer for a nominal amount known as the settlement fee. This fee may be £10 to £20 or a bit higher. The leasing company arranges for this procedure. A big tax pitfall arises with this buyout by the farmer as he has acquired a tractor worth say £10,000 for a nominal sum of £20 plus the credit note for £9,980 received from the leasing company. This credit note amount of £9,980 will be added to income and suffer a tax claw back in that year. However, the farmer now owns this tractor after buyout and while he retains it, he can claim its value of £10,000 as capital allowances over the

following seven years. To reduce the impact of this tax clawback farmers are opting for longer lease periods. When a leased machine is traded in it also gives rise to a refund of lease payments which are subject to tax clawback as described above. The proceeds from the trade-in can be used as advance rentals against a new leasing arrangement but for tax relief they must be spread forward evenly over the primary lease period. Large initial up-front "Balloon" payments are not accepted by Revenue. The longer a leased machine is held by the farmer before buying it out or trading it in, the lower the machine's value and consequently the lower the tax clawback. Start lease agreements as early as possible in the accounting year. Take professional advice on the tax consequences of finance leases before you enter a lease agreement. Try to match the primary lease period with the period you expect to hold the machine for. Respond promptly to negative option letters from the leasing companies. If not responded to, the lease will be terminated and the tax consequences outlined earlier will be triggered.

#### d) **Example Cases**

Three example cases are presented showing the financial calculations for financing a new tractor by deposit and term loan, hire purchase and leasing.

Points to note include:

- (a) There is usually a Documentation Fee of say £50 at start. Insurance is extra.
- (b) Tax relief at 44% versus 22% gives a lower net cost for all methods. Tax relief will drop in future as tax rates drop. Savings in P.R.S.I. and levies will reduce the net costs further but are not included in examples.

- (c) The net costs are lower for VAT registered farmers compared with unregistered 'Flat Rate' farmers. The VAT refund of 4.2% added to the sales of 'Flat Rate' farmers helps towards equalising this difference in net costs over time.
- (d) VAT registered farmers can claim back VAT up-front on machines purchased by Term Loan and Hire Purchase but not on Leased machines. VAT on lease payments is claimed back after each lease payment is made.
- (e) Watch out for the tax claw back when a leased machine is bought out or traded in at the end of the primary lease period.
- (f) There is a different cash flow pattern for each example over the 7 years and also for the Flat Rate versus Registered Farmers for VAT.

## **Machinery Hire**

Tractors, loaders, trailers and other machinery can be hired for short-medium periods rather than purchased. The full costs are an expense for tax purposes and registered farmers can reclaim the VAT. Example hire costs are:

- 100 HP tractor for 1 week = £380 + 21% VAT
- 100 HP tractor for 1 month = £350 / week + 21% VAT
- 100 HP Tractor for 3 months = £300 / week + 21% VAT

## **Contract Hire**

Some of the big contractors are using this system for new tractors, combines and forage harvesters. The contractor has an agreement with the finance company and hires the machine but does not own it, but there is an option to purchase at the end of the period. The annual charge is based on tractor working a set number of hours and penalties apply if

limit is exceeded. All operating costs, excluding fuel and oil are included in the annual charge.

**Example:** High specification 125 HP tractor for 5000 hours of use over 3 years.

Hire cost is £6000 per half year + 21% VAT

## **Conclusions**

- The financial and taxation aspects of new machinery investment are complicated and farmers should get advice from their accountants and financial advisers before making new investment decisions.
- Contractors and farmers have made considerable investment in farm machinery in recent years and with farm incomes recovering this investment is expected to continue.
- Interest rates have increased in the past year. Check for the most competitive finance packages.
- The main types of finance used for new machinery are Hire Purchase, Leasing and Term Loans.
- Hire Purchase is more widely used now than Leasing as VAT can be reclaimed upfront by registered farmers and the tax consequences are more predictable.
- Leasing gives the finance company best security as they own the machine. The tax situation after the Primary Lease can be complicated.
- Cash flow pattern varies for each finance method.

**Example 1 - Buying Tractor Direct - Cash Deposit + Term Loan**

Purchase of 125 Horse Power 4 WD High Specification Tractor

- a) Tractor Cost = £45,454
- b) Add VAT @ 21% = £ 9,546
- c) Full Purchase Price = £55,000

<b>Flat Rate Farmer for VAT</b>	<b>VAT Registered Farmer</b>
Purchase Price = £55,000	Purchase Price = £55,000
Less Cash Deposit = <u>£15,000</u>	Less VAT reclaim = <u>£ 9,546</u>
= £40,000	£45,454
<b>a) £40,000 Term Loan over 4 years</b>	<b>a) £40,000 Term Loan Over 4 Years</b>
With quarterly repayments (APR = 8.7%) (in arrears) = £297.52 per year per £1000 borrowed Annual repayment = £11,901 per year Total repayments over 4 years = £47,604 Total Term Loan Interest = £7,604	Details see across  <b>b) Capital Allowances on £45,454</b> First 6 years @ 15%/year = £6,818 Final year 7 @ 10% = £4,545
	<b>c) Total Tax Relief over 7 years</b> Capital Allowances = £45,454

<p><b>b) Capital Allowances on £55,000</b></p> <p>First 6 years @ 15%/year = £8,250/year</p> <p>Final year 7 at 10% = £5,500</p> <p><b>c) Total Tax Relief over 7 years</b></p> <p>Capital Allowances = £55,000</p> <p>Loan Interest = £7,604</p> <p>£62,604</p> <p>Tax Relief @ 22% = £13,773</p> <p>Tax Relief @ 44% = £27,546</p>	<p>Term Loan Interest = £7,604</p> <p>Interest for 3 months on VAT amount before it is reclaimed.</p> <p>Short loan @ 8.57 % = £204</p> <p>£53,262</p> <p>Tax Relief @ 22% = £11,718</p> <p>Tax Relief @ 44% = £23,436</p>
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**Example 1 - Continued**

Flat Rate Farmers for VAT	VAT Registered Farmer
<p><b>d) Net Cost over 7 Years</b></p> <p>Total Costs:</p> <p>Machine Costs = £55,000</p> <p>Add Loan Interest = £7,604</p> <p>Add 4% Net Interest on own cash (£15,000)</p> <p>£600/year x 7 years = £4,200</p>	<p><b>d) Net Cost over 7 years</b></p> <p>Total Costs</p> <p>Machine Costs = £55,000</p> <p>Loan interest = £7,604</p> <p>Loan for VAT - Interest = £204</p> <p>Interest on Cash Deposit of £5,454 @ 4% Net</p>

	=	£218/year x 7 years	= £
£66,804		<u>1,526</u>	
<u>Net Costs After Tax Relief</u>		£64,334	
At 22% (£66804 - 13773) =			
£53,051		<u>Less Tax Relief + VAT Refund</u>	
		Tax Relief 22% + VAT Refund =	
At 44% (£66,804 - 27,546) =		£21,264	
£39,258		Tax Relief 44% + VAT Refund =	
		£32,982	
		<u>Net Costs after Tax Relief + VAT Refund</u>	
		At 22% = £43,070	
		At 44% = £31,352	

**Example 2 - Buying New Tractor on Hire Purchase**

Purchase of 125 Horse Power 4 WD High Specification Tractor

- (a) Tractor Cost = £45,454  
(b) Add VAT @ 21% = £ 9,546  
(c) Full Purchase Price = £55,000

<b>Flat Rate Farmer for VAT</b>	<b>VAT Registered Farmer</b>
<p><b>a) 4 year H.P. Agreement</b>  8 Half yearly payments (1 up front) at £143.71 per £1000 per ½ year (APR=8.57%).  £55,000 borrowed - repayment = £7,904/½ year</p>	<p><b>a) 4 Year H.P. Agreement</b></p> <ul style="list-style-type: none"> <li>VAT reclaimed up front  Borrow for 3 months £9,546 at 8.57%  = £204 interest.</li> <li>Amount on H.P. at 8.57% =</li> </ul>

Repayments = £15,808 / year x 4  
 = £63,232  
 Total Interest = £8,232

**b) Capital Allowances on £55,000**

- First 6 years at 15%/year = £8250/year
- Final year 7 at 10% = £5,500

**c) Total Tax Relief Over 7 Years**

- Capital Allowances = £55,000
- Loan Interest = £ 8,232  
= £

63,232

- Tax Relief at 22% = £13,911
- Tax Relief at 44% = £27,822

£45,454  
 £143.71 per ½ year per £1,000

- Repayments = £6,532 per ½ year (£13,064 / year)
- Total repayments = £13,064 x 4 = £52,256
- Total Interest = £6,802

**b) Capital Allowances on £45,454**

- 6 years at 15% / year = £6,818
- Final year 7 at 10% = £4,545

**c) Total Tax Relief over 7 years**

- Capital Allowances = £45,454
- Interest on H.P. = £6,802
- Interest (loan to cover VAT) = £204

=  
 £52,460

- Tax Relief at 22% = £11,541
- Tax Relief at 44% = £23,082

**Example 2 - Continued**

Flat Rate Farmer for VAT	VAT Registered Farmer
<b>d) Net Cost Over 7 Years</b>	<b>d) Net Cost Over 7 Years</b>
• Machine Cost =	• Machine Cost = £55,000

<p>£55,000</p> <ul style="list-style-type: none"> <li>• Interest on H.P. = <u>£</u> <u>8,232</u></li> </ul> <p style="text-align: right;">=</p> <p>£63,232</p> <p><u>Net Cost After Tax Relief</u></p> <ul style="list-style-type: none"> <li>• At 22% (£63,232 - £13,911) = £49,321</li> <li>• At 44% (£63,232 - £27,822) = £35,410</li> </ul>	<ul style="list-style-type: none"> <li>• Interest = <u>£ 7,006</u> = £62,006</li> </ul> <p><u>Less Tax Relief + VAT</u></p> <ul style="list-style-type: none"> <li>• Tax Relief 22% + VAT Refund = £21,087</li> <li>• Tax Relief 44% + VAT Refund = £32,628</li> </ul> <p><u>Net Costs After Tax Relief</u></p> <ul style="list-style-type: none"> <li>• At 22% + VAT Refund = £40,919</li> <li>• At 44% + VAT Refund = £29,378</li> </ul>
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**Example 3 - Lease Agreement for New Tractor**

Leasing of 125 Horse Power 4 WD High Specification Tractor

- (a) Tractor Cost = £45,454
- (b) Add VAT at 21% = £ 9,546
- (c) Full Tractor Price = £ 55,000

<b>Flat Rate Farmer For VAT</b>	<b>VAT Registered Farmer</b>
<p><b>a) Lease Agreement over 4 years</b></p> <p>8 half yearly payments ( 1 up front) at £143.71 per £1000 per ½ year (APR = 8.57%)</p> <p>£45,454 Tractor = £6,532 per half year</p>	<p><b>a) Lease Agreement Over 4 Years</b></p> <p>(Same figures as for flat rate farmer)</p> <p>£7,904 per ½ year x 8 = £63,232</p> <p><b>b) VAT refund claimed after</b></p>

<p>£6,532 per half year + 21% VAT (1372) = £7,904 £7,904 per ½ year x 8 = £63,232</p> <p><b>b) Tax Relief Over 4 Years on Lease</b></p> <ul style="list-style-type: none"> <li>• £63,232 at 22% = £13,911</li> <li>• £63,232 at 44% = £27,822</li> </ul> <p><b>c) Net Cost at End of Year 4 (The Primary Lease Period)</b></p> <ul style="list-style-type: none"> <li>• At 22% Tax = £49,321</li> <li>• At 44% Tax = £35,410</li> </ul> <p><b>d) Enter Secondary Lease (years 5,6,7)</b></p> <ul style="list-style-type: none"> <li>• £100 /year x 3 = £300</li> </ul>	<p><b>each payment (over 4 years)</b> £1,372 x 8 = £10,976</p> <p><b>c) Tax Relief on Lease Payments (excluding VAT)</b></p> <ul style="list-style-type: none"> <li>• £52,256 at 22% = £11,496</li> <li>• £52,256 at 44% = £22,992</li> </ul> <p><b>d) Net Cost at End of Year 4 (the primary lease period)</b> <u>Gross Cost Less Tax Relief + VAT Refund</u></p> <ul style="list-style-type: none"> <li>• At Low 22% Tax = £40,760</li> <li>• At High 44% Tax = £29,264</li> </ul> <p><b>e) Enter Secondary Lease (years 5,6,7)</b></p> <ul style="list-style-type: none"> <li>• £100 / year x 3 years = £300</li> </ul>
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**Example 3 - Continued**

Flat Rate Farmer For VAT	VAT Registered Farmer
<p><b>e) Net Cost for Years 1 to 7</b></p> <ul style="list-style-type: none"> <li>• At 22% Tax = £49,554</li> <li>• At 44% Tax = £ 35,576</li> </ul>	<p><b>f) Net Cost for Years 1 to 7</b></p> <ul style="list-style-type: none"> <li>• At 22% Tax = £40,946</li> <li>• At 44% Tax = £29,402</li> </ul>
<b>Alternative 1 = Buy out after primary lease period</b>	
<ul style="list-style-type: none"> <li>• Assume Value of Machine = £22,000</li> <li>• Buy our for £20 Fee</li> <li>• Receive Credit Note = £21,980</li> </ul>	<ul style="list-style-type: none"> <li>• Machine value = £22,000</li> <li>• Buy out fee = £ 20</li> <li>• Receive Credit Note = £21,980</li> <li>• Credit Note Value Taxed at 22%</li> </ul>

<ul style="list-style-type: none"> <li>• Credit Note Value Taxed at 22% or 44%</li> <li>• Machine now owned and qualifies for capital allowances on £22,000 over 7 years</li> <li>• Net cost after 7 years if buy out At 22% Tax = £51,994 At 44% Tax = £40,734</li> </ul>	<ul style="list-style-type: none"> <li>• or 44% on (£21,980 less VAT of £3,815) = £18,165</li> <li>• VAT of £3,815 repaid</li> <li>• Machine now owned and qualifies for capital allowances on £18,165 over 7 years</li> <li>• Net cost after 7 years if buy out At 22% Tax = £46,767 At 44% Tax = £37,469</li> </ul>
<p><b><i>Alternative 2 = Trade-in the leased tractor after primary lease period - this will have similar tax consequences to Alternative 1. But new tax allowances become available for the new machine which replaces the trade-in.</i></b></p>	

## **Contractor's Viewpoint - Making It Work**

***David Butler, Consultant/Machinery Consultant, U.K.***

I operate an agri-contracting business in the South East of England, some of you will say 'God's Country'. The land is graded as one better than the worst, I am surrounded by overpaid, nosy commuters, restricted in operation for noise, smell and being on the road at the wrong time! From what I have seen of Ireland so far, I suggest the boot is on the other foot!

My business is considered a large contracting one. The turnover on contracting is ¾ million on 2000-2500 acres grass silage, 1500 maize, 2000 acres arable work and 60 million gallons of slurry. Today I also contract farm a further 2800 acres involving 800 cows and 1500 acres arable. I started 13 years ago with £50K turnover, living in fear of losing

a job to a competitor, but I have succeeded on competing with service never on price.

We have learnt today that the pressure continues to exert itself on our industry. The relenting World Trade negotiations, expansion of the EU and government interference exerts enormous long-term macro pressure. Probably the most pressing today is the increasing difficulties in employing affordable good staff and then operating them on fully justified reliable machinery.

However, for the same reasons that we as contractors will find it tough so too will our farmer customers. In my opinion I believe that the future for us all in agri-contracting does look good, which I am sure Tom Murphy will expand on in the following paper. But as strong as the future is for farm contracting this alone will not guarantee the success or survival of our businesses. We too will have to examine and re-examine our costs. We must all do our own 'pencil work', let's be sure not to do these calculations under the influence or with 'rose tinted glasses'.

Our own future is only as secure as we wish to make it. All of us in agri-contracting must consider the following when looking for future strategy and making our businesses work: -

1. In my view a value for money service will be the key to continued success. Being the cheapest is not in the best interests of you the contractor or our farmer customers. There is no such thing as a 'GOOD, CHEAP JOB'! Offer something more than your competitor, e.g. enhancement or quality of chop.
2. We all know that the maximum profit in any business is earned where marginal revenue equals marginal costs, i.e. the extra penny earned is at least equal to the extra penny spent. But this economic fact does depend on you knowing exactly your unit returns and unit costs. It is

so easy to slip into the situation where your additional costs are greater than your additional returns and usually this happens a long time before you realise, leaving it too late to solve.

3. We must all stop living out of the depreciation of our machinery. This practice leaves nothing in the 'pot' for when machines are due for replacement. If this habit continues long enough you will eventually run out of finance options or run down equipment, both of which means the end of the road.
4. Let's all think about the reason why we are doing this service. Is it to be a 'macho kid' - I have the biggest tackle, or I can do it for less than him; or is it that we just enjoy it and making a living is secondary. We must be careful not to end up in an early grave by just being busy fools!
5. We must avoid getting carried away with unnecessary expenditure on half-utilised equipment or setting up infrastructures that are too rigid and become a burden. You need to be 'lean and mean' to survive as a contractor and this will undoubtedly become more so.

I would now like to share with you some thoughts for our own farm contracting business and how I make it work:

- a) We must all start to become better planners. It is no longer acceptable or possible to base our industry on 'fire brigade' work - our kit is just simply too expensive to be justified to chance.
- b) I suggest we sign up our customers to 3-year contract with maybe the advantage of loyalty discount that is paid at the end of year 3. Maybe an insurance scheme could be included to guarantee the income for contractor and farmer.
- c) As investors in machinery we should consider the best ways to pay for it in the light of our taxation rules. I understand you have a 15% write

down allowance on equipment. Maybe it would be more prudent to have lease rental agreements on machinery, which is totally tax allowable. This also has the added advantage of you not being able to live out of depreciation because this is largely taken into account in the agreement charges. Not do you have to find the replacement figure either. I have found short-term hire is ideal for peak activity or for a ½ machine justification.

- d) We should recognise the value of our service more and charge accordingly, i.e. the best quality silage cop demands best premium price. Maybe, we should learn to charge according to time of service, i.e. peak season - peak rate (mention auction room concept).
- e) We are not bankers, so if credit is required we should charge for this. Cashflow management or lack of it is usually the major cause for farm contracting failure than anything else. My approach to this is to sign up customers to finance companies to pay my bill or accept cheques spread over several months but agreed in advance of the operation.
- f) By being properly organised we can gain economies of scale. This should be to everyone's advantage, not just farmer customers. Keep this gain to yourself.
- g) Better marketing of our services will be vital to compete on quality rather than price. Also this exercise should educate our customers to the value for money that we can offer. This will mean getting on our 'bikes' and selling ourselves, which I promise you is not easy. Sometime ago I set up a forage discussion group to help my customers understand the value in cutting earlier or chopping finer.

- h) Why not carry out some market research to see what customers require or what potential customers are looking for. One of my own recent surveys has indicated some interesting results. Appendix 1.
- i) If our time or resources cannot manage to run an efficient administration, how about forming a contractor's administration co-operative to centralise raising invoices, chasing debt and getting paid at the right time. There may even be an EU subsidy for this area?
- j) I have diversified into sewage spreading and processing, and into share farming and management services for 'city farmers' the green wellie brigade. This thought of diversification and being aware of opportunity and grabbing hold of it when available reminds me of a story I heard recently.

However, it is not the panacea for everyone, nor is it the magical solution to ailing businesses. It does work for individuals who can operate from a business perspective or have a flare for that avenue. But please remember, any attempt, no matter how worthy or sincere, will take your eye off the main 'ball'. One main problem I have found in operating outside of agriculture is dealing with commercial sharks. You may think you have a deal, but it is not valid unless agreed in writing and in triplicate. All terms of contract are spelt out. If you breach the contract you will have to argue for your money. You will probably not get paid quickly and insurance required for specialist work is expensive. If there is an opportunity look at it carefully and go for it.

Farm contracting around the globe continues to help the farming industry to reduce the cost of doing the job. It was a great relief to me to see unsubsidised farm economies such as New Zealand use contracting services and at very commercial rates. (Appendix 2), it was clear to me

that in the real world there was no room for subsidisation from the farm business operating a contracting fleet at reduced rates.

Contractors had to charge what the task cost, plus a profit and real farmers accepted that price as cheaper than they could gear up to themselves and was competitive in the value for money stakes.

During my Nuffield tour in 1994, I met many examples of contractors, who to me illustrated some of the main points I have made today. I would now like to show you some of these on slides.

One of the everlasting quotations I will remember from my travels was from Aussie, who was a bit of a philosopher. He said "The 3 biggest lies in the world are: -

1. The cheque is in the post - how many times have we heard this?
2. My wife does not understand me - which has bothered me ever since.
3. I am from the government and I am here to help you - I no longer believe politicians or have confidence in their strategies."

Now I guess the message I am saying from all this is that there will never be a level playing field in international food trade. Individual farmers will always be price takers rather than price makers, and we agricultural contractors must survive by our own efforts and ingenuity and not be lead down paths that leave us short of cash or without a sustainable business. Let's not forget the value of wisdom.

Therefore in conclusion, it is my opinion there is a tremendous future for contractors, but it is going to be based on these who do their sums first, set standards and achieve customer demands and then charge enough to pay for a decent living and reinvestment. Who in this room can honestly say they achieve all these factors?

We are currently an integral part of the agricultural industry and will become an even more important part of the farmers future operation. Let's educate our customers in realising this, let's educate ourselves in valuing this, let's reach a common sense approach to the business involved and let's all of us within our total agricultural industry work together to pull through the uncertain times ahead. Farmers need you as much as you need them.

### Appendix 1 - Replies to Silage Questionnaire - February 1998

	Percentage		
	Yes	No	?
1. Overall are you satisfied with our silage making services?	94	6	
2. Do you feel we offer value for money?	100		
3. Would you be prepared to grow varieties of maize that suit a wider harvesting window?	24	76	
4. Would round the clock maize harvesting be acceptable to you?	59	41	
5. Could you guarantee all clamps to be ready to fill before our arrival?	100		
6. Could you guarantee any additive requirements to be ready to apply when required?	76	6	18
7. Are you prepared to be booked into a sequence of operations and for that to be locked in?	59	41	
8. Would you be prepared to pay a rate of charge depending on timeliness?	29	29	42
9. Would you be prepared to commit your custom for three years to gain a loyalty discount?	76	12	12
10. Are you prepared to arrange field location,	88	6	6

tree branch removal and quality of tracks to maximise the potential output of the operation?			
11. Would it be a help to pay in instalments starting in advance of the operation, but the average date of payment ending one month following work done?	24	76	
12. Do you think it is fair a penalty charge is made to those customers who cause unreasonable delay?	94	6	
13. Would you be prepared to pay into an insurance syndicate to protect against harvest loss or reduced quality due to harvesting delay?	18	64	18
14. To speed the total operation up would you agree that no sheeting up service should be provided?	65	35	
15. Please indicate your likely silage requirements for 98 season:			

Any other constructive comments or ideas would be extremely useful. Please do not hold back! Use other side if necessary.

Key: ? = no answer/unsure/need more details/possibly

## Appendix 2 - Examples of Contractor Rates £/Acre

	<b>Canada</b>	<b>Germany</b>	<b>Aus.</b>	<b>N. Z.</b>	<b>U.K.</b>
Combining	<b>13.5</b>	<b>35</b>	<b>11</b>	<b>32</b>	<b>25</b>
HD Baling		<b>3</b>	<b>4</b>	<b>3.2</b>	<b>2</b>
Mowing	<b>5</b>	<b>9</b>	<b>5</b>	<b>13</b>	<b>9</b>
Maize Chopper	<b>20</b>	<b>35</b>	<b>40</b>	<b>44</b>	<b>32</b>
Ploughing	<b>7.5</b>	<b>15</b>	<b>13</b>		<b>14</b>
Drilling	<b>5</b>	<b>8</b>	<b>7</b>		<b>8</b>

# **Is There a Future for Agricultural Contracting?**

***Tom Murphy, Director, PAC Ireland***

These few words today are entitled "Is There a Future for Agricultural Contracting?" and will deal with a number of key issues that affect agricultural contractors and their future.

Firstly I will address, what I call, the "Attitude Problem" towards agricultural contractors; the attitude of Government, Brussels, Agricultural Advisers and Farmers. The policy makers of these four bodies barely recognise the role of the contractor or the vital role he will play in the survival of Irish Farming and indeed European Farming.

Reforms to the Common Agricultural Policy, from the time of Ray McSharry right up to Mr. Fischler today, requires that farmers reduce their overheads, including the purchase of new machinery, thus making their businesses more cost effective and their end product more competitively priced. All this reform is very commendable and necessary if we are to compete on the world market, but it is all based on the assumption that agricultural contractors will be there to play an increasing role in providing mechanical services to farming. Government and even Brussels, do not recognise agricultural contractors as part of the Agricultural Sector, even less do they know or appear to care about the strengths and weaknesses of the agricultural contracting industry, an industry upon which the success of the CAP Reform depends.

At a recent meeting I attended in Brussels I asked a very senior Bureaucrat that in reforming the CAP what consideration had been given to agricultural contractors and the role they are expected to play in such reforms. He was dumbfounded and following other exchanges he

acknowledged that my point was extremely valid and now through CEETTAR, the representative body for contractors in Europe of which PAC Ireland is a member, dialogue has started with the appropriate departments.

Here at home it is hard to believe that our own Department of Agriculture has no information or statistics on agricultural contractors and nor do they recognise them as part of the agricultural sector but as a service industry.

PAC Ireland has prepared a survey and, as funds become available, will shortly commence interviewing one thousand contractors. The results of this survey will be presented to our government and to my bureaucrat friend in Brussels.

Agricultural contractors should be recognised as mainstream players in agriculture and be considered for compensation in the same way as farmers, when the weather seriously affects their livelihood.

At the Teagasc Agri Food Millennium Conference it was said, and I quote from page 52 of the conference papers, and let me say here that out of a 137-page report these two lines are the only reference made to contractors and worse still in the Department of Agriculture Agri 2010 Report not once are agricultural contractors mentioned. Anyway back to my quote ... "Contractors will carry out more and more farm operations in addition to silage harvesting and slurry spreading".

Is that so? What do the policy makers know of agricultural contractors? Are contractors included in training workshops, seminars dealing with REPS, Environmental Protection, Nutrient Management, seminars on where farming is going over the next ten years and where they as the

providers of mechanical services are expected to fit into this plan? The answer is "No" they are not.

At a local level what liaison is there between advisers and the agricultural contractors who provide mechanical services to their clients. How many farmers in one locality are advised to "cut on Monday", without consideration for the contractor who cannot be in five places at once.

Wouldn't it be more constructive if consultation took place before advice that may bring about a change in farming policy is given, say, on silage requirements or method of harvest, or for example "Cash in on grass" or a move from pit to baled silage or vice versa. The contractor is an element in the equation, and the knock on effect on his business and the fact that he has over the years invested hundreds of thousands of pounds in machinery to service his clients must be considered.

It should be a cause of concern to us all that very often agricultural policy relies on one word "If". We are told "Feed resource will be predominantly based on grazed grass and grass silage will assume less importance especially IF the price of concentrate continues to fall and IF progress continues in relation to maize production". Concentrate feeding levels will increase. But two big IF's have been omitted that is IF there is no world crisis and IF the weather co-operates.

Surely advice that encourages farmers to put all their eggs in one basket; for example save on silage making by leaving cattle out later and then put them out early in spring doesn't work when bad weather kicks in and reserve feed costs farmers so much. Luckily government will often help farmers but there is no such help for the agricultural contractors who were left with less work, under-utilised machinery, reduced income and finance houses looking for their repayments. Is it any wonder that some contractors get out of silage?

This is not my first time to stand here and speak in the hallowed environs of Kildalton College, and I hope after today it will not be my last!! Some of you may think I should not criticise the Government, Brussels, the Farming Sector and even Teagasc for their lack of consideration of agricultural contractors, but facts are facts, and progress can only be made if all parties recognise one another's difficulties and deal with them head-on.

That said I must pay tribute to Kildalton College and I cannot praise its staff highly enough, for they alone **have** recognised the role of agricultural contractors, not only by conducting this workshop today, but over many years. I can only hope that by highlighting these important issues the powers that be and the policy makers will enter into dialogue with PAC Ireland on the training of agricultural contractors and their role in the Agricultural Sector and particularly address the question of extending the silage season. There is no scientific reason why this cannot be done, quite the contrary; there is sound economic evidence that two cuts give the farmers a better financial return.

The next part of my talk today is directed at Agricultural Contractors. There are generally two sorts of contractor and the old saying "Is the glass half empty or half full" can best describe them. One contractor will tell you about the high cost of fuel and labour, about his prices being undercut, how hard it is to collect his money and how he'll probably be out of business before too long.

Another contractor facing the same problems does not dwell on them but constantly reviews his business. He has an efficient office, he sheds unprofitable customers, charges a viable price (including a profit margin), does not give extended credit and plans to be in business for many years to come. The moral of this story is that there is no place in this industry any more for "messers".

We are rapidly leaving behind the days when a lad could "dabble" in contracting. There is too much at stake these days for farmers, what with REPS, EDA, Department of Agriculture Code of Good Farming Practice and customer driven quality assurance, for them to employ anyone but a professional agricultural contractor. In my view the policing the schemes I have just mentioned will, in the not too distant future, come under the jurisdiction of county councils and they will licence only those who are qualified and conform to the required standards. In order to meet these licensing requirements, contractors are going to have to invest in acquiring the appropriate training for both themselves and their employees.

Contractors must stop grousing, take a good hard look at their businesses and, if they intend to continue as agricultural contractors, start immediately to see themselves as professional business people and make no excuses for running a professional outfit, charging a viable price to ensure they will be there to service the farming sector for years to come. They should take heart from the positive side of all the reforms taking place in agriculture. Their role has moved centre stage and they are in effect the "strongest link" without who a major part of our economy cannot be successful.

There is no doubt there is a strong and vibrant future for Agricultural Contracting.

## **Choosing Tractor Tyres**

**Dermot Forristal, Teagasc, Oak Park Research Centre, Carlow**

Larger tyres, which form a bigger contact patch with the ground, pull well and, more importantly with to-day's machinery weights, achieve lower ground pressures. Big tyres can carry heavy loads at low inflation pressures. Low inflation pressures result in low ground pressures. All tyres have load and inflation tables which indicate the load that can be carried at various pressures. An example of a tyre load/inflation pressure table is given in Table 4.

**Table 4 - Tyre load capacities (kg) at various inflation pressures**

<b>Inflation pressure (bar)</b>	<b>0.8</b>	<b>1.0</b>	<b>1.5</b>
<b><i>Tyre size</i></b>	<b><i>Load (kg)/tyre</i></b>		
13.6-38	1230	1410	1840
16.9-34	1715	1935	2495
18.4-38	2085	2370	3070

Tyre selection should be based on the axle loads being carried and the level of ground pressure required. Ground pressures required will depend on the work being done and soil conditions. For cultivations and drilling work, tyres large enough to operate at pressure of 0.8 bar (12 psi) and below are now frequently used. It is important to note that the trend is towards lower ground pressure, particularly for cultivation and drilling equipment, i.e. larger tyres capable of running at lower pressures. Even on grassland there is concern at the potential damage that heavy axle loads on conventional tyres can cause.

Recent tyre developments are aimed at satisfying these demands. The lowering of minimum inflation pressures below the previous 0.8 bar limit and the introduction of wider low profile (60-70% aspect ratio) tyres are two such developments.

## Lowering Tyre Pressures

Until a few years ago, conventional tractor tyres had a minimum inflation pressure requirement of 0.8 bar (12 psi). Even if very large tyres were used with more than adequate load-carrying capacity at 0.8 bar, the inflation pressure could not be lowered below this point. Effectively, this resulted in a higher ground pressure being exerted than the tyre size would indicate, as the tyre was not allowed to 'flatten' to form a good-sized contact patch with the ground. Recent tyre developments allow lower inflation pressures to be used; down to about 0.5 bar (7 psi) provided the tyre is large enough to carry the load. This allows the full benefits of larger tyres to be gained. Some manufacturers are also allowing more weight to be carried at a given inflation pressure. Table 5 shows the change in load, and corresponding inflation pressure requirements, for a 16.9-34 tyre over a 10-year period.

**Table 5 - Load capacity (kg) and inflation pressure values for a 16.9-34 tyre**

<b>Pressure (bar)</b>	<b>0.5</b>	<b>0.6</b>	<b>0.8</b>	<b>1.0</b>	<b>1.4</b>
	<b>Load (kg)/tyre</b>				
1983 values			1515	1730	2105
1986 values			1715	1935	2380
1992 values	1470	1710	1860	2005	2380

Allowable pressures have dropped and load capacities have increased. It remains vital, however, that the tyre is inflated to the correct pressure for the load being carried. Tyre pressures should be adjusted to suit the job in hand. Axle loads must be known and an accurate pressure gauge must be used.

## Low-Profile and Very Wide Section Tyres

The introduction of low profile tyres and very wide tractor tyres has greatly increased the options available to those selecting tyres.

Most of the major tyre manufacturers are now producing a lower profile tyre range (60-70% aspect ratio) in addition to their conventional range. The use of lower aspect ratios allows a wider section tyre to be fitted to a rim of the same diameter as a standard tyre and yet have the same overall diameter. Seventy per cent aspect ratio tyres are normally about 12% wider than conventional tyres of the same overall diameter. The low aspect ratio, in addition to providing greater width, is also claimed to improve tractive performance by providing better contact between the tyre and the ground.

One of the advantages of '70' series tyres is that they offer a simple solution of increasing tyre width on 4WD tractors without altering the drive axle ratios. With conventional '80' series tyres, size options on 4WD tractors are more limited.

The increased carrying capacity of the wider section '70' series tyres is illustrated in Table 6.

**Table 6 - Load capacity (kg) of '70' series tyres compared to conventional tyres (Pirelli)**

<b>Pressure (bar)</b>	<b>0.4</b>	<b>0.6</b>	<b>0.8</b>	<b>1.0</b>
<b><i>Tyre size</i></b>				
16.9-34	-	-	1715	1935
480/70-34	1710	1920	2120	2320
18.4-38	-	-	2085	2370
520/70-38	2110	2360	2610	2860

In many situations, '70' series tyres can be fitted to the same rims as their narrower '80' series tyre counterparts. This makes up-grading of tyre equipment relatively inexpensive. However, care must be taken in this regard. To get good performance from the '70' series tyres and to

avoid tyre and rim damage, they should only be fitted to the recommended rim size. Sometimes this will correspond to the rim used on the '80' series tyre fitted as standard, but often the '70' series tyre requires a wider rim. It is likely that '70' series tyres will take-over from '80' series tyres in the not too distant future. Tyre manufacturers are not stopping there however. Sixty-five and sixty per cent aspect ratio tyres are in production, particularly where very wide high load capacity tyres are required.

### **Wide Section Tyres**

Coupled with the introduction of low-profile tyres, some manufacturers have introduced a range of very wide tractor tyres with widths of up to 800 mm and maybe more. These tyres can carry heavy loads at very low inflation pressures and are a real alternative to dual wheels. They are designed as a full traction tyre unlike Terra Tires which are only intended for LGP use. Their narrower overall width compared to a dual wheel combination, is an advantage. Wider rims are needed for these 65% (or lower) aspect ratio tyres.

### **Wide Tyres or Duals**

With all these developments in tyres and machine weights, how does an individual decide what tyre option to use? There are no set answers. A 110 HP 4WD tractor operating a 3m one-pass is taken as an example. When lifted at the headland, the rear axle load would be about 7 tonnes. A number of tyre options and their corresponding inflation pressure requirements are given in Table 7.

***Table 7 - Inflation pressure requirements for a number of different tyres***

<b>Size</b>	<b>Inflation pressure for 7 t axle load</b>
-------------	---

	<b>(bar)</b>
16.9-38 single	Not capable of carrying load
18.4-38 single	1.9
520/70-38 single	1.5
650/65-38 single	0.7
16.9-38 dual	0.5
520/70-38 dual	0.4

This table shows that dual wheels are still a good option for many situations. The 70 series option given in this table has not an adequate carrying capacity. The 650/65-38 tyre shows the exceptional load-carrying capacity of modern wide-section traction tyres.

With the weight of modern machinery, tyre selection needs to be taken very seriously. The challenge is to convince users of this equipment that investment in expensive tyres will reap benefits in the long term.

## **Machinery Training Needs**

***Nigel Whyte, Machinery Teacher, Kildalton College***

Modern tractors and farm machinery are becoming increasingly technical in both their operation and maintenance in order to ensure increased productivity and performance from both the operator and the machine. This increased productivity and performance can only be truly maximised if the operators have received the proper training.

Here at Kildalton and other Agricultural Colleges we offer a variety of courses which are tailored to suit the different levels of training to meet with the machinery training demands of farmers / contractors and their operators.

The main skills taught are as follows:

- Tillage machinery operation
- Grassland machinery operation
- Machinery servicing and maintenance
- Machinery design and modification
- Machinery finance and management

Depending on the particular course of study followed students can study the above topics in greater detail.

The certificate in farming programme, which runs at all agricultural colleges, gives the students an appreciation for the operation and maintenance of tillage and grassland machinery.

More specialised courses like the Diploma in Agriculture (Machinery & Arable Crops) is run here at Kildalton College. This new course which is now in its second year was initiated due to increasing demand for trained machinery operators from tillage farmers, contractors and the machinery trade.

The major emphasis of this course is on the skilful operation maintenance and management of a wide range of agricultural machinery. This course, which is practically orientated, includes the following topics:

- Modern tractor and machinery operation and their working principles
- Engine, transmission and electronic control unit working principles
- Maintenance and repair of tractors and machinery
- Workshop practice, welding and fabrication
- Hydraulic, electrical and fuel system working principles and fault diagnosis
- Business management and information technology
- Crop production and management

- Environmental considerations

The Diploma in Agriculture (Farm Machinery) which is run at Pallaskenry Agricultural College includes the following topics:

- Farm tractors and machinery – construction and working principles
- Operations, care and maintenance of modern farm machines and tractors
- Engineering science, mechanics, mechanical drawing and AutoCAD
- Internal combustion engines, power transmissions, hydraulics and electrics
- Business management and information technology.

Both the above courses have a initial period of 6 months in the college followed by one year of supervised work experience where students can work with approved agricultural contractors, tillage farmers and machinery dealerships. This placement can also be spent in Europe or the U.S.A. working for Agricultural Contractors (combine crews), with dealerships or large farmers.

Following this placement period students return to the colleges for 12 weeks and complete the machinery costings, information technology and management components of the course.

For contractors / farmers who cannot afford the time for themselves or employees to attend full-time course, we also provide short courses here at Kildalton which can be in the format of one-day, two-days or five-days.

These courses are on the following topics and are subject to demand:

- Short course for Sprayer Operators
- One-Pass Operation

- Fertiliser Application
- Combine Operation
- Self-Propelled Forager Operation

Here at Kildalton we have built up our own knowledge and expertise by working closely with Waterford Institute of Technology and have developed close links with the machinery trade. With our modern workshop facilities and new machinery workshops and classrooms, which are under construction, we can provide the facilities for the trade to run training courses here at the college. By working closely with the trade we are able to avail of the use of modern machinery which complements our courses.

In order to ensure that contractors / farmers get the maximum return from investment in farm machinery they must fully optimise the use and operation of their machinery resources. The essential element for this is that the right people get the required technical, business and management skills, whether this training takes the format of a one-day event such as today or a two-year full-time course.

## **Agricultural Trailer Braking Systems**

***John Pettit, Teagasc, Kildalton***

Farm vehicles like any other vehicle must comply with Road Traffic Regulations, a lot of which have been in Legislation since the 1960's. The increasing number of fatalities on our roads, together with the demand for action on road safety, has resulted in stricter enforcement of these regulations. The Garda Síochana are now more stringent in relation to legislation regarding tractor trailers. Many farmers and contractors are discovering that their trailers do not fulfil the requirements laid down in the Road Traffic Regulations. This article will review the following:

- The Road Traffic Regulations in relation to trailer braking
- The mechanical options available to fulfil these regulations

Within the Road Traffic Regulations, tractor-trailers are divided into different categories. The manner in which the trailers are categorised is complex and leads to misinterpretation into which category a particular trailer belongs. To meet the Road Traffic Regulations one would be best advised to ensure that any tractor trailers over 5 tonnes laden weight should have a service brake, a parking brake and an automatic breakaway brake. The need for such braking systems is even more important with the introduction of 50kph tractors. European Regulations state that tractor trailer travelling in excess of 40kph should be equipped with air brakes. This option should be strongly considered for mechanical reasons and if any Irish Regulations were to be revised most likely they would be updated to that of the European Standards. The service brakes of the tractor and those of the trailer are required to be operated simultaneously by a single control (brake pedal).

The service brakes on trailers are either of the hydraulic or air type. Hydraulic braking systems would be adequate up to 40kph. Above 40kph the air system should be chosen. The hydraulic system is not as responsive as the air system. This results in a lag period between pressing or depressing the brake pedal and the brakes activating or de-activating respectively. The lag period between pressing the brake and the brake activating can lead to overloading the braking system. Similarly, the lag period between depressing the brakes and de-activating the brakes may cause the trailer's brakes to drag. This would result in excessive tire and brake wear. As the trailer speeds increase the consequences become more apparent hence the need to transfer from the hydraulic system to the air system if trailers exceed 40kph.

An automatic breakaway system is one that will activate the trailer brakes bringing it to a halt if it uncouples from the tractor. The air system by its working nature upon uncoupling will automatically activate the brakes. The hydraulic system however requires an additional mechanism or breakaway brake. An electrical activated system is currently available, and a trailer stand activation system is being developed.

The electrical activated system contains a hydraulic accumulator, which stores pressurised oil. Upon uncoupling, the electrical connection to the tractor or seven-pin plug is broken. This breaks an electrical circuit, which operates a valve at the base of the accumulator releasing the pressurised oil. The oil then pressurises the braking system, activating the brakes to bring the trailer to a halt.

The stand-activated system contains a hydraulic cylinder within the trailer stand. Upon uncoupling from the tractor, the trailer stand will hit the ground compressing the hydraulic cylinder. This will pressurise the braking system, activating the brakes, thus bringing the trailer to a halt.

## **Safety, Health & Welfare Issues for Contractors**

*John McNamara, Teagasc, Kildalton College*

Practical Safety Management will be the theme of the Safety, Health & Welfare Stand at the Teagasc Machinery Event at Kildalton College, Piltown, Co. Kilkenny on Thursday, 23rd November 2000.

An inspector from the Health & Safety Authority will be on hand to explain the legal requirements, under the Safety, Health & Welfare at Work Act, on contractors and persons operating machinery. The requirement to

prepare a practical safety statement for a machinery outfit will be outlined and practical examples will be given.

The Teagasc exhibit will feature:

- Safety with Machinery including covering Power Shafts
- Requirements for Workshop Safety / Electrical Installations
- Slurry gas detection systems
- Pesticide storage requirement
- Personal protective equipment
- Handling of loads – how to prevent serious back injuries
- Requirements for first aid and welfare facilities
- Requirements for staff competence and training
- Requirements for public safety

Safety management is a crucial part of running a successful contracting business or mechanised farm. High standards can be achieved. Accidents cause a lot of pain and suffering and disability. They also have an extremely negative effect on the business due to increased insurance costs and the impact on staff morale.