REPLACING MACHINERY: KWINANA WEST

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MACHINERY INVESTMENT AND REPLACEMENT OPTIONS FOR GROWERS IN THE KWINANA WEST RCSN PORT ZONE

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Introduction

This booklet investigates machinery replacement and ownership strategies, consideration and case studies. It aims to assist farmers in making machinery related decisions and includes some benchmarks by which comparisons can be drawn.

Benchmark figures are drawn from a survey of Kwinana West farmers and case study participants. Assumptions in figures quoted include a wheat price of $250/tonne and long-term average wheat yield in calculations relating to gross farm income.

Proportions of machinery use for livestock production, where applicable for mixed producers have been excluded from calculations.

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Basic variables

There are a number of basic variables when it comes to machinery replacement strategies. These are usually determined by recent seasons, grain prices, farm growth aspirations and expansion stage.

Machinery replacement selection is usually driven by:

- Hours or age when purchased
  - New
  - Low hours used
  - Higher hours used
- Attitude to repairs and maintenance
  - Access to diesel fitters, dealers, parts
  - Preference for warranty
  - Attitude to potential production risk
  - Availability of residual low-cost backup machinery
- Business phase
  - Expanding – need additional capacity
  - Comfortable – have cash to invest in machinery
  - Under pressure – need reduced capital costs

Machinery selection and turnover is usually governed by machine hours or area covered. Older machinery requires increased repair and maintenance regimes, but costs less to operate on a per hectare basis thanks to reduced depreciation. See Figure 1.

Conversely, the value of machinery can reduce rapidly lowering the depreciation cost component of running the machine. See Figure 2.

Farmers in the Kwinana West zone have varied attitudes to machinery purchases. Farm consultants will argue that most farmers simply like the smell of new paint and usually encourage their clients to keep machinery for as long as practicable. But farmers will counter this by highlighting the potential risk to production caused by breakdowns.

Somewhere in between, there is a sweet-spot. But where this is can vary according to all of the variables listed above. This report aims to look at the options for machinery replacement, assisting growers with some financial benchmarks to make the right choice regarding turnover timing depending on their situation and farm business aspirations.

To help establish machinery investment benchmarks, in December 2016, Kondinin Group circulated an electronic survey to growers across the Kwinana West zone asking them about their machinery inventory, value and changeover triggers. The results are discussed throughout this report with in-depth analysis prior to a series of case studies, observing the machinery investment profiles and strategies of farmers from the Kwinana West region.

Figure 1: Machinery purchase and retention: depreciation cost

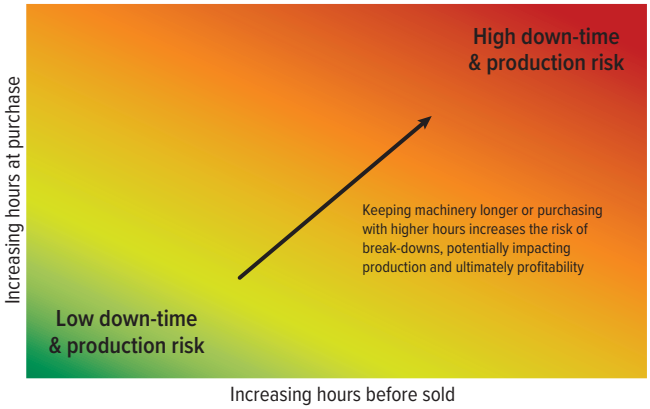
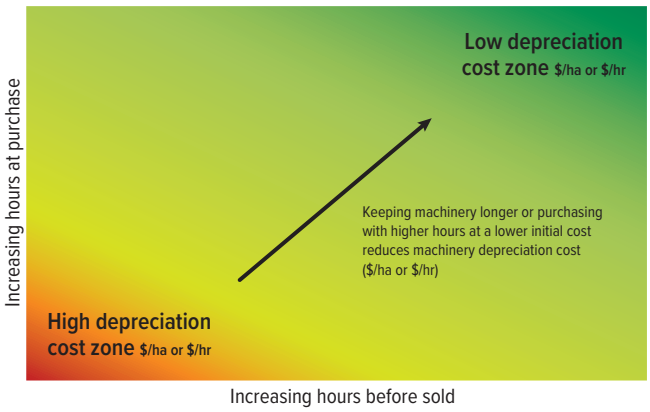


Figure 2: Machinery purchase and retention: depreciation cost



In particular, Kwinana West RCSN wanted to know more about

- Developing good strategies for replacement of machinery during hard times
- Opportunity cost of the capital that is tied up in machinery
- Different ownership models (for example; leasing versus owning)
- Running machinery over a longer period, and
- Running two or more pieces of similar equipment.

Strategies for hard times

Hard times often mean making hard decisions. With machinery purchases being second only to the investment growers make in land, optimising this investment can impact farm profitability.

Optimising machinery investment can be varied by altering machine financing arrangements, machine retention time or employing contractors to undertake some operations.

Financing and payment ratio

According to consultants ORM, financing machinery and routinely replacing it has seen machinery costs become a fixed overhead. They suggest as a proportion of farm income, this figure averages 11 per cent on a national basis.

To put this in context for the Kwinana West region, 11% of the gross income potential of $2.14m (as indicated in the survey) is $235,000 annually.

Keeping equipment longer

Running equipment for longer reduces the average depreciation cost, one of the primary machinery cost components of the combined cost of production.

A 2013 Planfarm report commissioned by the GRDC suggested that one third of farmers preferred "good second-hand machinery", 48% "purchased new and kept to long hours" while the minority (19%) preferred to change machinery over on a more regular basis. On a practical level, market forces maintain a balance through pricing and demand.

Calculating the depreciation cost requires monitoring the resale value of owned equipment. Using this figure, the cost of equipment operation on a per hour basis for powered equipment or by the hectare for trailing equipment can be calculated.

On a per hour basis, fuel and lubrication costs remain relatively static, depreciation and interest costs reduce while repair and maintenance costs can be expected to increase. See Figure 1.

Evaluating depreciation cost

Below is a real example of the depreciation cost per hour over the life of 30, used John Deere 8000R series tractors.

To calculate the depreciation cost per hour since new, the advertised second-hand price was deducted from the recommended retail new price then divided by the hours.

As expected, the more hours on a tractor the lower the average depreciation cost per hour becomes.

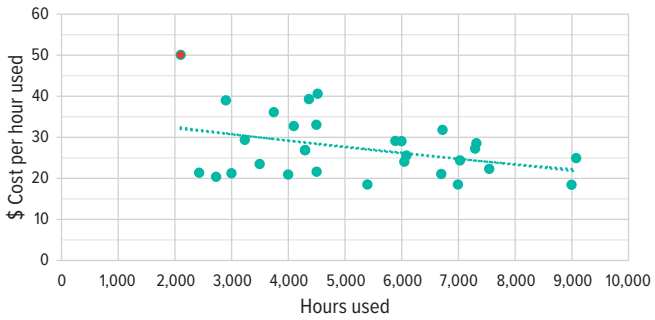
Using depreciation cost to aid purchasing decisions

When looking to buy a second-hand moderate hours machine, this approach can be applied to determine better value provided model and specifications and condition are similar. See Figure 3.

When purchasing second-hand, look for the machine that has incurred the highest cost per hour used to identify value.

A similar plot can be constructed by gathering specifications, operating hours and pricing of a range of comparable machines and identifying where machines sit relative to each other.

Figure 3: Depreciation cost of John Deere 8000R series tractors



In Figure 3, dots above the line of best fit represent machines that are more favourably priced. The red dot represents the best-value, lowest-hour machine on the market as it has seen the largest drop in price for the hours operated and also has low hours.

Some growers monitor the machine depreciation rate to trigger equipment turnover decisions. As an example, see the case study on Bob Nixon in this booklet.

Risks of keeping equipment longer

But keeping equipment for longer can increase timing, technology, repairs and maintenance risks. The risks of keeping equipment longer vary depending on equipment type and operation.

Seeding

The primary risk with seeding equipment is arguably capacity. Bar width or tank size may not deliver optimal field efficiency, that is, the proportion of time spent actually seeding, not refilling or transporting.

Capacity and resulting field efficiency needs to be sufficient to meet the required seeding window. This window can vary within the Kwinana West port zone but Farmanco data for the state suggests operational width and operating speed should be suffice to complete seeding in 2.4 weeks.

This figure assumes 100% field efficiency (round the clock operation with no stopping) and is calculated using the following equation:

$$\text{Seeding time} = \frac{\text{Total cropped area (ha)}}{\text{Bar width (m)} \times \text{Operation speed (km/h)} \times 18\ \text{hours/day} \times 6\ \text{days/week} \times 0.1}$$

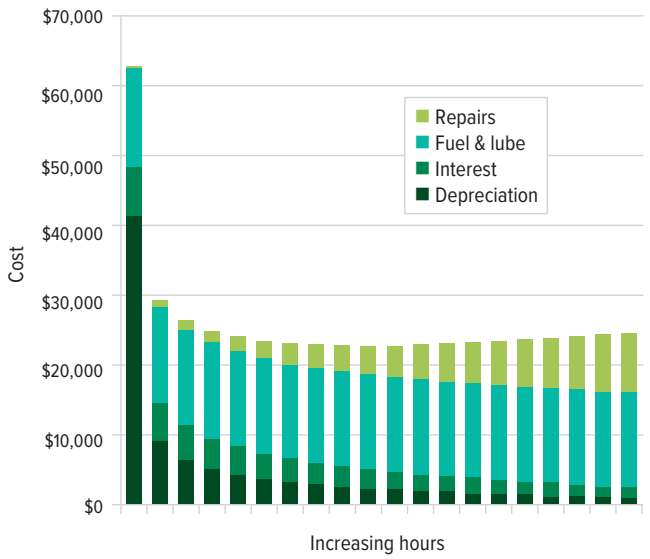
Use the above formula to calculate your seeding completion rate

Keeping seeding machinery for longer may see out-dated machinery technology or insufficient capacity push the seeding operation out of the optimal window and increase the risk of weather influences including frost. To overcome this, some farmers interviewed had addressed seeder capacity issues by fabricating and modification to enlarge bin sizes.

Seeding technology risk is centred around improving application efficiency. Reducing overlap, with seeder sectional control and variable rate application are two examples of input optimisation delivering savings of up to 13%, according to some Kwinana West farmers.

It should be noted that savings delivered by seeder technologies can vary according to farming regions within the Kwinana West region. Paddock shape and obstacles can also influence seeder technologies. York and Brookton within the Kwinana West region have irregular paddock shapes and large numbers of obstacles in paddocks forcing seeding duplication. Sectional control can minimise seeding duplication in these areas with savings delivering a rapid return on investment.

Figure 4: Example – relative equipment ownership costs of a FWA tractor



Source: Iowa State University (2015), Replacement Strategies for Farm Machinery

Tractors

Keeping tractors for longer risks higher repair and maintenance requirements and in most cases relies on the availability of suitably skilled personnel to undertake those repairs.

Survey and case study data from the Kwinana West zone indicates owners of tractors running higher total hours have local access to diesel fitters or are mechanically skilled themselves. Anecdotally, access to skilled personnel can influence machinery turnover decisions.

Power requirement – seeding tractor

Tractors need to be power-matched to implement requirements. This can vary significantly with soil type, depth of operation and ground engaging tool selection.

A Farmanco Profit Series report for 2016 suggests power requirement per meter of seeder width can vary by up to 20kW (27hp) but averages 21.6kW (29hp).

For a 12.2m (40ft) bar this equates to 263kW (352hp) and for an 18.3m (60ft) bar, the average tractor power was 395kW (530hp).

Calculate your tractor power per seeding bar metre. Is it under or over this figure?

Tractors with insufficient power per meter of operating width could see inadequate operation depth, reduced field efficiency or risking production with non-optimal seeding windows. Fuel use can also increase if operating outside optimal engine speeds to achieve the desired ground speed.

But additional power can substantially increase the cost of the machine. Particularly for large articulated 4WD machines which can increase in cost by around $400 per kW despite having the same powertrain configuration.

While it could be argued this is recouped when trading, this can vary between makes and models. If machines are out of warranty and additional power is required, it may be worth considering remapping the engine ECU with a power chip module from a reputable manufacturer.

Technology – seeding equipment

From a technology perspective, the primary consideration is compatibility with implement technology. Implement integration and control with machine telemetry utilising standardised CANBUS and ISO11783 protocol should be possible with most tractors built in the last 10 years.

Alternatively, electronic adapters, hydraulic string blocks and wheel sensors can be used to bridge the technology gap.

Investment in machine technology was not specifically sought as most technology investments including precision agriculture terminals, sectional control or variable rate application technology are generally bundled with equipment and so are difficult to isolate.

It is important to remember however that firstly, technologies invariably come at a premium cost to the grower and secondly, have a higher depreciation cost as technology is generally more rapidly superseded than equipment.

These two factors need to be considered in the context of depreciation cost and it may be worth separating the technology if possible when analysing equipment depreciation cost.

Fuel efficiency – tractors
Fuel efficiency has also improved over the last decade with later-built, more efficient engines and transmissions offering specific fuel consumption 10% lower than equivalently powered older models. As an example, a circa 2007 New Holland TJ480 used 307g/kW.h at 75% of maximum pull at maximum power. A 2017 T9 530 uses 280g/kW.h at 75% of maximum pull at maximum power. Over a typical seeding season of 400 hours this could equate to a difference of 2,500 litres of fuel consumption. Fuel savings alone are unlikely to warrant a replacement for seeding tractors, but could be a contributing factor.

Spraying equipment
The primary risks in keeping spraying equipment for longer periods to reduce depreciation costs are centred on field efficiency and technology. Spraying equipment should be sufficiently sized to complete a spray programme without overly risking application timeliness.

Referring again to Farmanco figures for a benchmark, average spraying time to completion was 0.9 weeks for a single complete pass. As with the seeding formula, it assumes 100% field efficiency and is calculated as follows:

$$\textit{Spraying time} = \frac{\textit{Total cropped area (ha)}}{\textit{Boom width (m)} \times \textit{Operation speed (km/h)} \times \textit{18 hours/day} \times \textit{6 days/week} \times 0.1}$$

Use the above formula to calculate your spraying completion rate

Field efficiency – spraying
The above formula assumes 100% field efficiency but this is never achieved. Time is spent roading, refilling and overlapping already covered ground. Spraying field efficiency can be calculated using the above spraying time calculation and comparing it with the actual hours taken to spray the cropped area.

Spraying field efficiency can be improved by reducing these, ensuring more time is spent spraying.

Increasing the scale of the sprayer width and tank capacity is one method of reducing refill times but can be limited by practicality in the Kwinana West zone, particularly in areas with irregular paddock shapes and in-paddock obstacles. Alternatively, a nurse tank or supplementary fill-point may reduce roading and refill times.

There is a debate regarding the field efficiency of Self Propelled (SP) sprayers versus trailing booms. A time-in-motion study across a number of properties has not yet been conducted at the time of writing, but may provide some insight and clarity to the argument.

Technology – spraying
Overlap can be addressed with an investment in technology when it comes time to upgrade the sprayer. Depending on boom width, sectional or even individual nozzle control can anecdotally reduce spray application volumes by as much as 10-15% in highly irregular-shaped paddocks.

Other machinery

'Other machinery', for example, specific hay equipment investment can be significant. Survey data from the Kwinana West zone suggested an average of almost 10% of equipment not considered strictly essential to production.

Contractors

In some cases there may be an option to reduce non-core machinery costs by seeking contractors to undertake operations including spreading, deep ripping, hay cutting, raking and baling. Of course the risk is securing contractors for time-critical operations where non-optimal timing can jeopardise quality. Conversely, contractor engagement can free staff up for other operations which may also be time-critical.

Few Kwinana farmers surveyed utilised contractors primarily for the three primary activities of seeding (4%), spraying (8%) and harvesting (19%). The exception to this was haulage with 38% of farmers surveyed utilising trucking contractors.

Kondinin Group research would suggest that this differs from the Eastern Australian states where contractors are used more extensively, particularly for harvesting operations.

Anecdotally, case-study participants suggested the reluctance of Kwinana West farmers to use contract harvesters was due to the relatively large scale of operations and high likelihood of a harvestable crop across the Western Australian wheat-belt in most years.

They also cited the large number of simultaneous harvesting operations making it difficult for contract harvesters to have multiple clients and a lengthy harvest window to keep machines running for adequate periods.

Opportunity cost tied up in machinery

Identifying the total machinery investment can be a daunting task when calculating the opportunity cost of equipment. To do this, Return On Investment is assumed to be 5%, being the average overdraft rate paid. Any cash (equity) therefore tied up in gear effectively costs 5% as it could alternatively have offset the overdraft by this amount.

- Opportunity cost of equipment based on average 5% Return On Investment
  - Surveyed farmers reported an average investment of $1.38m in farm machinery. Capitalised at 5% this equates to $69,000 per annum.
  - But having equity tied up in machinery may hinder exercising other opportunities, for example, expansion opportunities.
- Research revealed that capital tied up in machinery could also diminish farm equity levels. As a result, some owners have looked to limit machinery capital and worked to lease equipment separately. For these growers, this approach was successful in shifting equity in machinery to farm equity but required a good working relationship with a local machinery dealer with mutual trust between the two parties.

Ownership models – lease versus own
- **Owning machinery**
  - Benefits
    - Depreciation a tax deduction.
    - Depending on scale and use, may deliver a lower cost per hectare
    - Owner free to do as many hours as required
    - Freedom to modify machine if required
    - Ability to buy/own older, lower-cost machines
    - Can sell and buy other machines whenever it suits cash flow and opportunities
    - GST on the machine value is claimed up front at time of purchase

- Disadvantages:
  - Equity gets tied up in equipment
  - Repayments may be larger than cash flow allows
  - Ownership risks are carried – for example: repairs, faults, insurance

- **Lease**
  - Benefits:
    - Shifts equity out of major pieces of equipment and as a result reduces opportunity cost
    - Regularly update equipment to latest technology and new machine reliability
    - Uses buying power of a dealer or fleet buyer to be cost effective
    - May enable updating of several machinery items sooner than they could otherwise all be bought. For example, to convert to Controlled Traffic Farming
  - Disadvantages:
    - Difficult to establish
    - Requires individual approach with dealer
    - Limited hours per year (additional hours may be at agreed cost)
    - Locked into a fixed lease term
    - Unable to claim GST on the machine value only on the amount of each lease payment

Running over longer period

As a strategy for replacing machinery in hard-times or looking to reduce machinery costs by reducing depreciation cost, running equipment for longer can reduce the cost of machinery to the business.

But there are limits to how far this can extend, and not all of them are purely financial. Outside the already outlined capacity and technology risks, equipment reliability can be an issue.

Risks include equipment failure at a critical time in the season. This can mean critical cropping operation windows are missed, impacting on yield and ultimately profitability.

As repair and maintenance costs grow, it should be remembered that the cost of repairs and maintenance may not be recouped in trade-in value.

A less common but nevertheless reported issue was that older equipment can make it difficult to source quality operators. According to three of the surveyed farmers, operators prefer driving newer and more reliable machinery making it more difficult to source drivers for older gear.

Running two or more pieces of similar gear

There were mixed opinions when asked if operators preferred to use two or more pieces of similar equipment.

According to owners running two similar machines (as opposed to one large machine) one is always running, even if there is a breakdown with the other. This strategy relies on the availability of capable staff and the logistical ability to support two machines.

Owners running one large high value machine suggested they were able to focus maintenance and operational logistics efforts keeping the one machine operating at peak field efficiency during operations.

The exception to the rule is operations with two distinct properties with a geographic separation forcing farmers in this scenario to road equipment between farms, utilise contractors or have a set of plant on both properties.

The stretch phase

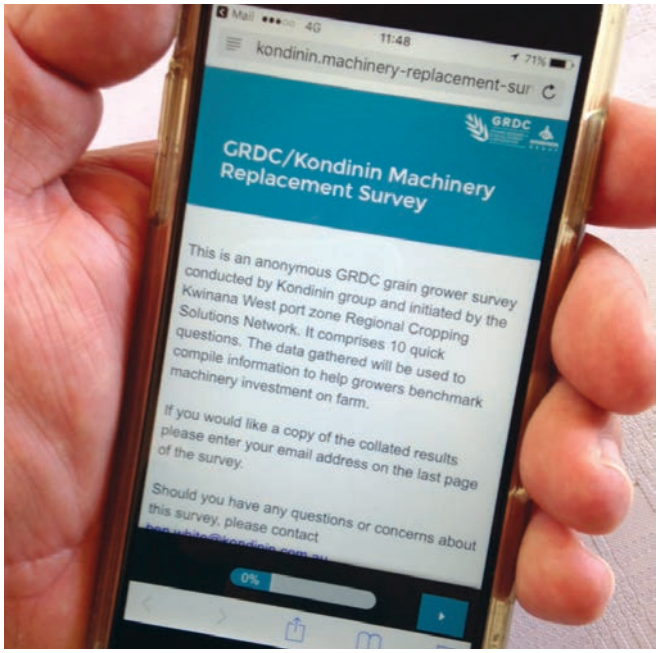
Five to six thousand hectares is arguably the maximum size one "set" of machinery (i.e. one large seeding tractor with air commodity cart and bar, 36m spray boom with tractor or SP and one class 8-9 harvester) can manage without substantially impacting optimal operation windows.

For operators expanding beyond 5-6000ha, some in the Kwinana West zone have utilised the low depreciation cost base of current older plant and supplemented this with a new or low-hour plant set.

As the enterprise stretches out into another "set" of machinery, this approach keeps average plant hours, downtime and repairs and maintenance costs down while sustaining a relatively low average depreciation cost.

Survey

In December 2016, Kondinin Group circulated an electronic survey to growers across the Kwinana West zone asking them about their machinery inventory, value and changeover triggers. Twenty-seven growers responded with full sets of data. The aim of the survey was to get a snapshot of machinery investment and replacement strategies employed by farmers in the Kwinana West zone.



Definition: Gross Income Potential (GIP)

Gross Income potential (GIP) has been calculated based on the grower's long-term average wheat yield being planted over the whole farm and sold for $250 per tonne to establish a relative, indicative income figure to compare machinery investment to.

GIP has been calculated as follows:

GIP = Cropped area (ha) × long term wheat yield (t/ha) × $250

Using the above formula, calculate your GIP – we will use this for other calculations in this booklet

Definition: Machine inclusion

Survey respondents were asked to identify and apportion hours and values for machinery specific to the three primary operations on farm being seeding, spraying and harvesting.

Seeding equipment is defined as the seeding tractor or apportioned hours used for seeding, seeding bar, air commodity cart and grouper.

Spraying equipment included the spraying tractor or hour portion thereof, boomspray or self-propelled boom and nurse tank.

Harvesting equipment included the harvester, chaser-bin, chaser tractor or apportioned hours thereof and mother bins.

Other significant equipment included fertiliser spreaders, hay making equipment, telehandlers, swathers and deep-rippers.

Trucks and trailer particulars were calculated separately but included in total machinery investment calculations.

Smaller, less significant machinery including 4WD utes or any machinery with a value under $10,000 have not been included.

Market value

While significant research has been conducted to ensure accuracy, machine values are estimated and are at best indicative only. Market values have been drawn from auction results, used machinery yards and dealer quoted prices. In this publication, 'investment value' refers to the current market value rather than the original purchase price.

Machinery metrics

In much research investigating machinery investment, figures are regularly quoted as an investment per area. While $/Ha provides an interesting benchmark it fails to take into account land productivity potential. Investment as a proportion of GIP however accommodates the production potential of the property which can vary significantly across the Kwinana West zone.

Survey findings

Twenty-seven growers in the Kwinana West port zone participated in the farm machinery survey. Farm cropped area ranged from 1,200 to 13,300ha with an average of 3,891ha.

Long term wheat yields quoted ranged from 1.45 to 3.5t/ha with the average being 2.3t/ha.

Total gross income per farm based on quoted wheat yields ranged from $690,000 to $5,985,000 with an average of $2,123,000.

Total machinery investment per farm for the primary operation equipment ranged from $350,000 to $3,375,000.

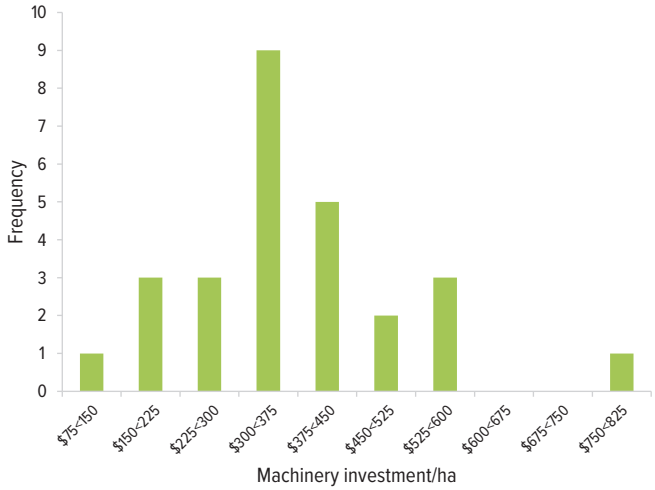
The resulting total machinery investment per hectare average was $381 but ranged from $113 to $813.

Consider the value of your machinery by operation. If you use equipment for multiple operations, apportion the value relative to the annual hours of use. For example if using the seeding tractor for 400 hours as well as another operations, including chaser-bin work for 100 hours, apportion 80% of the seeder tractor value to seeding operations and 20% to harvesting operations. If machinery is used for livestock enterprises, apply only the proportional value used in the cropping operation.

Machinery investment by operation	Proportion of use for operation	Machine value	Investment (% use x value)
Seeding			
Tractor(s)			
Seeder bar & cart(s)	100%		
Grouper			
		Seeding subtotal $	
Spraying			
Tractor(s)			
Trailing boom(s)			
Nurse tank / batchers			
Self-propelled sprayer(s)	100%		
		Spraying total $	
Harvesting			
Harvester(s) & Front(s)	100%		
Tractor(s) (chaser)			
Chaser bin			
Chaff-cart			
Mother-bin			
		Harvesting Total $	
Trucks			
Prime-mover(s)			
Trailers			
Dollies			
		Trucks total $	
All other significant machinery >$10k			
Telehandler			
Other tractors			
Wheel loader			
Forklift			
Hay making equipment			
		Other machinery total $	

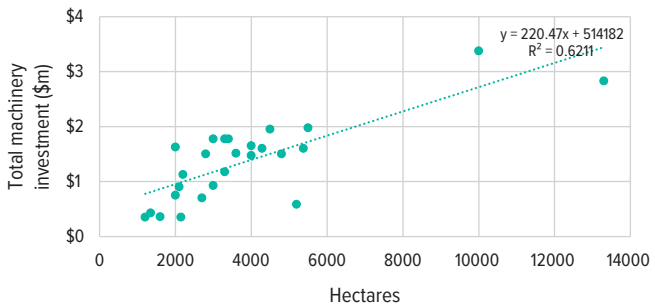
Total Machinery Investment $

Figure 5: Frequency histogram: Machinery investment $/ha



Plotting machinery investment against cropped area demonstrated the broad spread of investment relative to total cropped area.

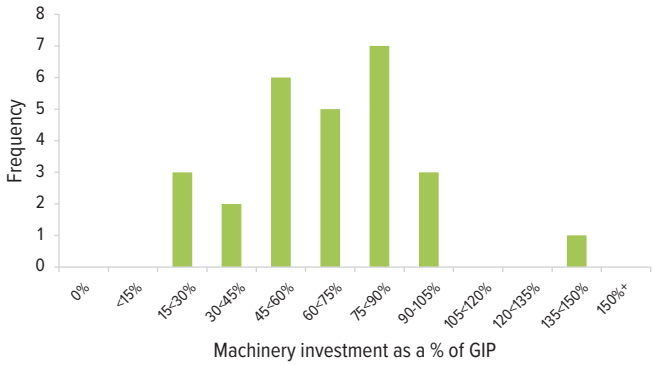
Figure 6: Total machinery investment relative to area



Using the calculation sheet, calculate your investment in machinery relative to area

More informatively, as a proportion of GIP, machinery investment averaged 65% and ranged from 20% to 148%.

Figure 7: Frequency histogram: Machinery investment as a % of GIP

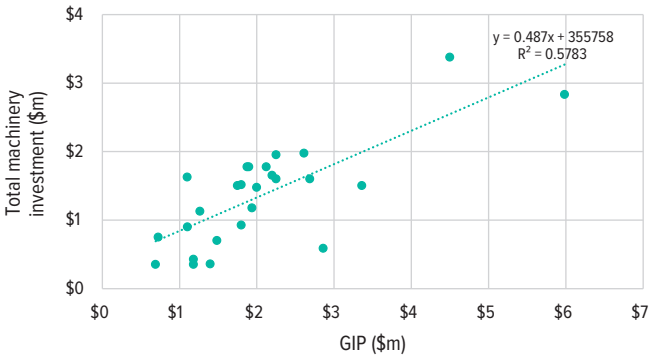


Growers surveyed with lower or more efficient machinery investment had around 20-40% of GIP invested in machinery while the higher investment operations were invested to between 80 and 100% of GIP.

Plotting GIP against machinery investment demonstrated the spread of approaches with a broad trend as would be expected.

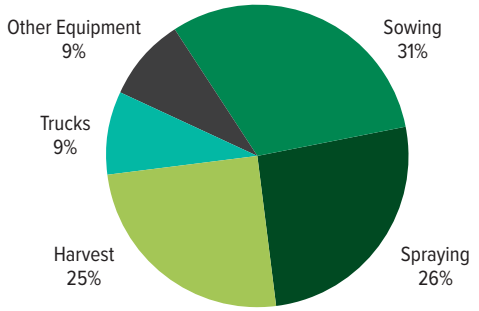
Where do you sit on this chart? Are there options for optimising this investment?

Figure 8: Total Machinery Value relative to GIP



When broken down by key operation, machinery investment as a proportion of total machinery investment averaged 31% for seeding, 26% spraying, 25% harvest, 9% trucks and 9% other equipment.

Figure 9: Equipment value by operation



Calculate your equipment value split. Does your investment vary substantially from the survey results?

While there was a large variation in machinery investment strategies each grower had a particular strategy matched to their business. Most of smaller scale growers were running cheaper second-hand equipment because investment in new machinery could not be warranted.

The exception to this rule was evident where a piece of equipment could be utilised for multiple operations. For example, a tractor used for seeding, spraying, spreading and pulling a chaser-bin warranted investment in a later-release, low hour and more reliable option in place of several second-hand tractors.

There were also examples of growers running older equipment but with a backup in case of a break down. The second tractor, typically had a low residual value, for example worth less than $10,000 on the market, but retaining it meant reliability could be guaranteed with a lower overall investment.

In cases where the farmer was confident with mechanical maintenance and repairs; older, cheaper equipment was typically used and operated by the owner.

A number of farmers interviewed demonstrated excellent people management skills and utilised this strength to either employ mechanically minded workers or ran newer equipment they could confidently ask less-skilled workers to drive.

Triggers for replacement ranged depending on the primary machine operation.

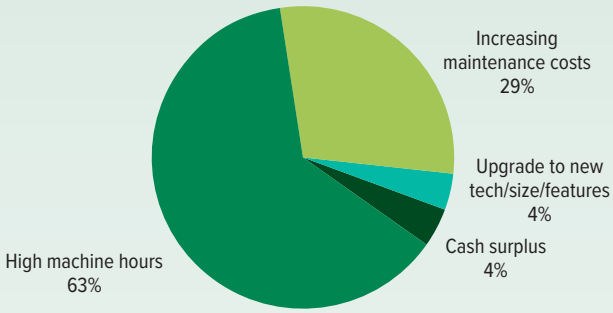
By operation: Seeding

Snapshot: Investment in machinery by operation: Seeding

Average seeding tractor(s) investment	$215,000
Average air commodity cart and bar investment	$207,000
Average seeding rig investment	$428,000
Average investment in seeding gear $/ha	$110/ha
Average investment in seeding gear as a % of GIP	20%
Average seeding hours per year	555h

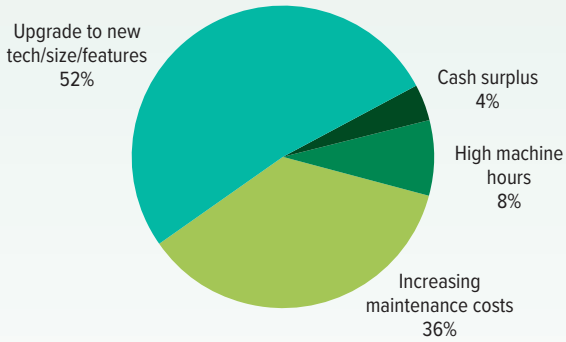
Seeding and spraying tractors were reported to be replaced based on high hours or maintenance costs for 82% of growers.

Figure 10: Primary reason for upgrade – seeding tractor



Farmers' approach to replacing the seeding bar and air cart was mixed with 36% suggesting maintenance costs are the primary trigger for replacement. 47% said they wanted to upgrade to a seeding rig with superior size, technology, features or configuration.

Figure 11: Primary reason for upgrade – seeding cart & bar



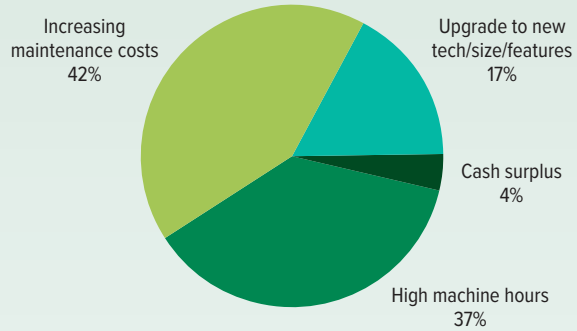
By operation: Spraying

Snapshot: Investment in machinery by operation: Spraying (Tractor & Boom or SP)

Average spraying rig investment (including any tractor use proportion)	$352,000
Average investment in spraying gear $/ha	$101/ha
Average investment in spraying gear as a % of GIP	18%
Average spraying hours per year	617

Spraying equipment was reported to be replaced primarily (79%) due to high hours or maintenance costs while 17% of owners were typically looking to upgrade the boomspray with upgraded capacity or technology.

Figure 12: Primary reason for upgrade – boomspray (inc SP)



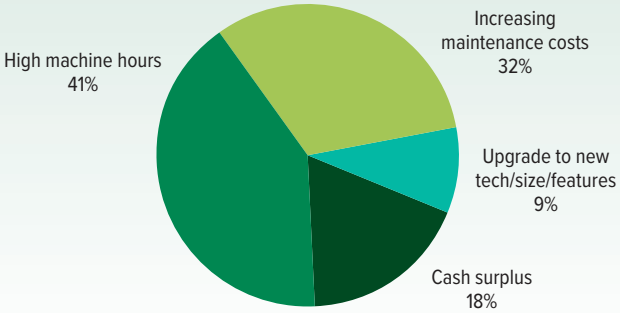
By operation: Trucks

Similarly, trucks were also said to be kept for longer and replaced less frequently than other machinery. Growers said their replacement trigger for trucks is; 24% when they have cash surplus, 64% due to high kilometre or maintenance costs and 12% were to upgrade.

By operation: other tractors

For other non-essential tractors, 63% of growers said high hours or maintenance costs were the replacement trigger and 18% indicated these machines are replaced when there is cash surplus.

Figure 13: Primary reason for upgrade – other tractor(s)



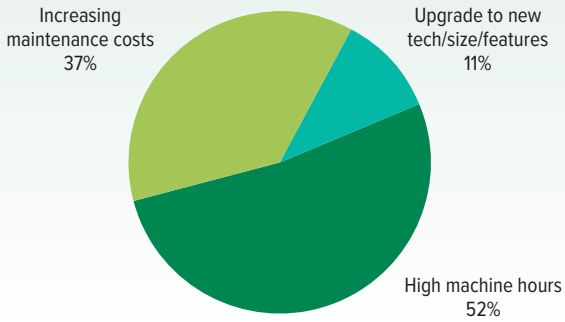
By operation: Harvesting

Snapshot: Investment in machinery by operation: Harvesting

Average harvester investment	$343,000
Average investment in harvesting gear $/ha	$93/ha
Average investment in harvesting gear as a % of GIP	18%
Average harvesting hours per year	494h

When asked about their harvesting operation, 89% of survey respondents indicated their replacement trigger was high hours or maintenance costs.

Figure 14: Primary reason for upgrade – harvester



Case study: Trevor & Renae Syme

Location: "Waddi Park" Goomalling

Rainfall: 397mm GSR 280mm

Soil type: Variable, Red clay, gravels and non-wetting sands

Cropping area: 3,800ha

Crops grown: Wheat, barely, canola, lupins

Average wheat yield: 2.5t/ha

Permanent labour units: 2

Seasonal staff: 2 backpackers for seeding and harvest

Machinery investment: $592/ cropped ha

Machinery investment as percentage of average gross income potential: 95%

Trevor Syme recommends doing some homework and thoroughly understanding equipment specifications before shelling out for new gear, not just buying what the neighbours have as it may not suit your farming operations for the life of the machine.

Trevor has formulated his machinery inventory around a full controlled traffic farming (CTF) configuration based on 3m wheel centres and 12.2m width multiples.

To fit this configuration, Trevor has a 36.6m boom, 12.2m custom-built Gessner frame fitted with Equaliser tines which has a manual side shift for inter-row sowing and a 12.2m draper front on the harvester.

Most machinery replacement considerations therefore have to take the CTF and wheel-centres into consideration.

Trevor normally buys gear new and has a long ownership programme, with the exception of the John Deere 4930 sprayer which he purchased off his contractor after finding it difficult to secure the contractor when needed.

The combination of a Goldacres trailing boom provides a level of redundancy but allows one machine to be used on cereals while the other can get on to spraying lupins and canola without the requirement for multiple decontaminations.

The 8345RT is mostly used for seeding. It is also used on the spreader and chaser-bin if needed. The 9420T was purchased second hand and its primary use is on a clay delver and deep ripper.

The Symes hire a prime mover for harvest and lime and fertiliser carting. According to Trevor, grain tippers seem to hold their value and have relatively low maintenance costs.

In terms of a replacement strategy for his existing equipment, Trevor primarily bases decisions on whether he has a cash surplus regardless of the machine. The correlation between high hours and increasing

One of Trevor's concerns is the rising relative cost of new equipment. He says that while there are options for financing, things take longer to pay for now.

	Make & model	Current hours	Hours / year	Replacement trigger
Seeding tractor	John Deere 8345RT	5,100	600	Increasing maintenance costs
Second tractor	John Deere 9420T	4,500	200	Will not replace
Third tractor	John Deere 8320	8,500	700	High machine hours
Sprayer	Goldacres 6536 John Deere 4930 SP	3,500	400	Increasing repairs and maintenance costs
Harvester	John Deere S680	1,100	500	Increasing scale of farm and high machine hours
Seeder	Gessner Landmaster frame with Equaliser tines John Deere 1910 cart	New		Technology upgrade which fits Controlled Traffic configuration
Trucks	6-wheel freightliner Howard Porter pocket train (50t payload) Ford Louisville with Tornado grouper trailer		Varies	Unlikely to replace
Other significant equipment	Marshall Spreader 910T			

Case study: Norm Jenzen

Location: Cunderdin

Rainfall: 287mm GSR

Soil type: Medium sand, blue clay, sand over gravel and sand.

Cropping area: 5,000ha

Crops grown: Wheat, barely, canola, oats, lupins

Average wheat yield: 1.9t/ha

Permanent labour units: Self +1

Seasonal staff: 1-2 seasonal staff for seeding and harvest

Machinery investment per hectare: $359/cropped ha

Machinery investment as percentage of average gross income potential: 76%

Cunderdin farmer Norm Jenzen reckons it is easier to focus on, maintain and invest in one large set of plant and run it around the clock, rather than have two sets of smaller plant. This extends to his second tractor which, when running the numbers, tell him he would be better running just one large 4WD for seeding and chaser-bin work and doing away with the second tractor once all costs are taken into account.

Machinery decisions for Norm are usually discussed with the family and a farm consultant. Equipment is usually purchased new with Norm suggesting that it pays to run the numbers, with some low-hour machinery costing as much as a new machine once all costs are taken into account.

Norm reckons it is important to get the balance right with cash surplus between scale expansion and the corresponding plant requirement. He says that if the scale of the operation is increasing, then scaling up machinery to match should be a priority in preparation for the expansion. Contractors are only called in for the Jenzens for specialist jobs including direct harvesting canola at around $45/ha plus fuel. For all other operations, Norm has sufficient scale.

Norm's advice for machinery investment and changeover is to do the numbers carefully with a focus on return on investment.

Repairs and maintenance are all done on-farm with capable and mechanically-minded staff who work with Norm to maintain and repair equipment. To aid the on-farm maintenance programme, the Jenzen farm has a well-equipped workshop including custom dolly frames to remove the broad elevator from the harvester for maintenance.

	Make & Model	Current Hours	Hours / year	Replacement trigger
Seeding & spraying tractor	Case IH QuadTrac	1,400	500	Depreciation cost based – varies on no-trade figures
Second tractor	Case IH 9380	6,000	250-300	Low residual value – maintenance driven
Third tractor				
Sprayer	Case IH 4430 Patriot CustomQuip flat-bed truck with nurse tank	600	600 250-300	Depreciation rate of around $80-100 per hour
Harvester	Case IH 8230	880	440	Usually every 4 seasons – hours dependent and depreciation analysis
Seeder	DBS 40' with 4-bin Ausplow air commodity cart	9 seasons		Technology and capacity driven
Trucks	Iveco Powerstar Aluminium Customquip gone to 60T legal capacity tippers and Dollies	2 years old	40,000km	High mileage
Other significant equipment	Grouper: 2-bin and Flexi-N tank			

Case study: Matt Steber

Location: Doodlakine
Rainfall: 320mm
Soil type: Mixed red murrel to sand plains
Cropping area: 10,000ha
Crops grown: Wheat, barley, canola, lupins
Average wheat yield: 1.8t/ha
Permanent labour units: 2 + self
Seasonal staff: 1
Machinery investment: $338/ cropped ha
Machinery investment as percentage of gross income potential: 70%

Matt Steber recommends always being prepared, in a position to act if gear needs to be traded and not be in a desperate situation when turning gear over. When expanding the operation, the no-trade position should be used as a bargaining tool to extract the best possible deal.

For Matt, this involves regularly revisiting the numbers and talking to the dealer regularly, even informing them of plans for machinery turnover so they are in a position to let you know if they find something that comes up that might suit. But ultimately Matt makes the decision around what to buy and when himself.

Matt aims to turn machinery over regularly with the trigger coming at the $80-120 depreciation per hour operated point depending on the class of machine. This means that once the machine cost reduces to around $100 for every hour the machine has completed, it is time to start looking seriously at the numbers for turn-over. As such Matt suggests quotes should be gathered prior to seeding and harvest seasons.

Multiple machines operate on the Steber farming operation and Matt is the first to admit that the efficiency can drop off with multiple sets of gear. Estimating only 75% of maximum efficiency is achieved with the second machine, and 65% with a third means focus needs to be placed on extracting maximum efficiency from all plant.

But Matt also acknowledges that the implementation of a second "set" of gear has happened over time and correlates with the expansion of the operation. He suggests the second harvester is possibly an over-investment however, the season recently completed warranted the investment.

The purchase of a block to the north of the main farm over a national highway expedited the duplication of equipment with the larger gear difficult to transport between the two farms and under power lines. That said, the level of redundancy also provides a fall-back position if there is a breakdown, meaning time-critical tasks can still be completed without impacting the cropping operation and more importantly profitability.

Matt made a shift to self-propelled sprayers in 2003 for two reasons, field efficiency and minimisation of dust to improve chemical efficacy.

When it comes to trucks, tri-axle tipping trailers should be purchased new and optioned to be as light as possible, as they will not be superseded in the near future and will always be required, according to Matt.

Matt doesn't use any contractors because he has reached a point where operational scale and machine inventory means it is cheaper to use his own gear. Equally he doesn't undertake any contract work for others.

Financing gear could be cash or Chattel Mortgage, with Matt pointing out that some Chattel Mortgage rates are very cheap but he also likes to balance financed gear with cash purchases.

Maintenance on the Steber operation is all done on-farm except where powertrain warranty applies, in which case it is left to the dealer on behalf of the manufacturer.

	Make & model	Current hours	Hours / year	Replacement trigger
Seeding tractor	Case IH Steiger 600	1,200	600	4 seasons (3 years) Critical
Second tractor	Case IH Steiger 450	700	700	Non-critical (5000h)
Third tractor	Case IH Magnum 270	9,000	50	No replacement plans
Sprayers	Case IH 4430 Case IH 4420	1,500 4,100	700 300	Up to 2500h with confidence in one machine, but will keep longer if both continue without problems.
Harvesters	Case IH 8240 with Macdon D65 Case IH 8120 with Macdon D60	400 1,800	400 400	3000h turnover 3000h turnover
Seeding	24.4m Morris C2 bar, 9650 Morris air commodity cart 17.4m 5000 series Flexi-Coil with 4350 Flexi-Coil air commodity cart	4 seasons for C2 bar. 2 seasons for Morris air commodity cart 15 years for bar and 20 years for box		New technology Technology upgrade – sectional control non critical
Trucks	K200 Kenworth 2012 K108 Kenworth 2009	370,000km 860,000km	60,000km 25,000km	
Other significant equipment	Hobbs 3 in 1 bin, 45' Grouper (hydraulic drive)			

Case study: Roger Newman

Location: Cuballing

Rainfall: 400mm

Soil type: Mixed: York Gum, Jam over sandy gravels to loam clays

Cropping area: 4,400Ha including mix lease share area

Crops grown: Wheat, canola, barley, oats & oaten hay

Average wheat yield: 2.8t/ha

Permanent labour units: 3 including self

Seasonal staff: 1

Machinery investment: $477/ cropped ha

Machinery investment as percentage of gross income potential: 68% (excludes harvester)

Roger Newman has taken a different approach to purchasing his most expensive piece of equipment, the harvester. The arrangement involves working closely with one of his local dealers to lease his 10.90 New Holland and MacDon front. The benefits according to Roger include a 100% tax deductibility for the lease payments (not a depreciation schedule) and the ability to maintain high levels of technology on his harvesting equipment. Roger notes the harvester is equipment leased, not operating leased, meaning he has control over keeping up servicing and maintenance regimes.

Roger took the step of arranging the lease after a poor year saw him want to retain sound equity levels but also needing to upgrade his harvester. He says that the equity injection tied up in the harvester has effectively reduced his overdraft which is charged at a higher rate than any other finance he uses. According to Roger, as a guide, the difference in lease payments over a regular Chattel Mortgage are around 5-10% more annually but granted, Roger now utilises a larger capacity harvester. He points out that the dealer has access to very low cost finance and by default secures the maintenance programme for the machine over the life of the lease. As such, the relationship with the dealer is critical in making the deal work with mutual trust required to ensure both parties are happy with the outcome.

At the conclusion of the two-year arrangement, Roger and his dealer have a guaranteed buyback figure in place and Roger has agreed that the harvester will have done no more than 1000 rotor hours. Alternatively additional hours attract an additional fee. Roger also has first right of refusal should he wish to purchase the harvester. Roger suggests giving at least some consideration to lifestyle when it comes to machinery purchasing decisions. He argues that it is important to enjoy the job within reason. He also suggests giving careful consideration to resale value potential as depreciation can severely impact the total cost of ownership of equipment.

Roger finds two smaller 40' (12.2m) seeding units operating simultaneously suits their irregularly-shaped paddocks. He finds it more efficient to get the programme in this way, with at least one machine running if there is a break-down. Having come from a larger 60' (18.8m) bar, the outer wing folds were removed to go back to 40'. He adds however, full-time staff are employed to drive the seeders and suggests that investing well in staff pays off in the long-run with fewer break-downs and less equipment damage. Backpackers are only rarely employed.

All servicing is done on farm and machinery purchasing decisions are usually made in consultation with the family and their accountant. Consultants are employed to share operational ideas but Roger says that ultimately decisions rest with the farmer. Hay can be a large component of farm production and Roger has invested in hay-specific gear. Roger says the Krone HD baler effectively increases storage capacity by 15-20%. It should be noted that this investment may also skew machinery investment data.

	Make & Model	Current Hours	Hours/year	Replacement trigger
Seeding tractors	Caterpillar 775E	1,100	1,100	High machine hours – 5-6000h provided repairs and maintenance does not blow out
Second tractor	John Deere 8285R	4,500	1,100	High machine hours – 5-6000h provided repairs and maintenance does not blow out
Third tractor	John Deere 6155R with FEL	new	600	High machine hours
Sprayers	Nitro 5333	2,400	600	High machine hours
Harvesters	New Holland 10.90 on tracks with MacDon front with integrated HSD	1,000	500	2 (1000h) or 4-year (2000h) turnover as per lease arrangement
Seeding	2 x 12.2m Flexi-Coil ST820 bar 1 x 2340 Flexi-Coil cart plus liquids 1 x 14,000L Ausplow Multistream			Technology/Design Technology/Design
Trucks	Iveco with Bruce rock trailers and dollies Mercedes Actross with Roads-west trailers flat-tops and drop-deck	Varies Varies	Varies Varies	Excessive repair and maintenance bills will trigger changeover
Other significant equipment	Krone HD baler, Bredal k105 spreader, JCB 531-70 Telehandler, MacDon m205 windrower with mower conditioner, Wongan steel 20t chaser bin, Agrifab grouper, Wheel loader, Trufab 110t field bin			

Case study: Ashley Chadwick

Location: Williams

Rainfall: 400-450mm GSR

Soil type: White sandy gravel

Cropping area: 1600ha

Crops grown: Wheat, barely, canola, oats, lupins

Average wheat yield: 3.5t/ha

Permanent labour units: 1.75

Seasonal staff: Backpacker for seeding and harvest

Machinery investment: $223/ cropped ha

Machinery investment as percentage of gross income potential: 26%

Ash's machinery replacement strategy stems from his core business principle 'it has to provide a return on investment'. The first question to ask is 'do you really need it?'

He has purchased one tractor new (Case IH Magnum 240), which does many time critical operations, mainly seeding, spraying, spreading, mowing and baling.

The balance of Ash's machinery is purchased second-hand with a few hours to enable lower losses in depreciation.

Ash stresses that buying used equipment requires homework to check if parts are readily available and there is good access to mechanics who are familiar with the type of machine you're buying.

Most of the machinery maintenance is done by Ash on-farm or with the assistance of his local mechanic. Without a local mechanic knowledgeable on Case IH harvesters, Ash said he would be reluctant to own the one he's got with relatively high rotor hours. The general plan for harvesters is to buy them about 10 years old with 2-2,500hrs and keep them for 5-6 years.

When it comes to making a decision on replacing machinery Ash involves his consultant, who encourages him to not overspend on shiny new gear.

In good years when cash is available the focus is to expand the farming area and invest in on-farm grain storage. Machinery is typically only replaced when it becomes overly unreliable.

When the time comes to purchase equipment, cheaper items are purchased with cash surplus or overdraft and the larger items are purchased using a Chattel Mortgage facility.

Contractor truck operators are used to cart grain at harvest which Ash says is working well. Other than that, contractors are rarely used, the exception being when they occasionally need a self-propelled sprayer to get over a tall crop late in the season.

	Make & model	Current hours	Hours / year	Replacement trigger
Seeding & spraying tractor	CaseIH Magnum 240	300	800	5,000hrs / reliability
Second tractor	1986 Steiger Bearcat & 9230 CaseIH	9,500	250	4-5 years' time (too hard to maintain)
Third tractor	90hp Valtra		250	
Sprayer	Hydraboom 80' 3,800lt			Upgrade to second-hand 5-6,000lt in 12 months
Harvester	2380 CaseIH	3,800	350	4,000hrs (5-6 yrs)
Seeder	Gason Scaritill + 1850 air cart + 3800lt UAN cart			Upgrade to bigger cart but will require bigger tractor
Trucks	Acco 2350 tipper			
Other significant equipment	Hitachi loader, Allis 7040, Carry grader			

Case study: Bob & Daniel Nixon

Location: Kalannie

Rainfall: 300mm

Soil type: Mixed, light through to heavy clay

Cropping area: 13,300ha

Crops grown: Wheat, barley, canola,

Average wheat yield: 1.8t/ha

Permanent labour units: 3.5

Seasonal staff: Four for seeding, two for harvest

Machinery investment: $213/ cropped ha

Machinery investment as percentage of average gross income potential: 48% (Season dependent, try to keep under 50%)

Bob and Daniel are an example of growers who know the numbers that make their business tick. Machinery replacement is largely based on optimising the depreciation cost per hour without compromising reliability. They regularly get quotes to trade existing machinery on new equipment to calculate how much the current machine has cost over its life.

The aim is to find a sweet spot where the depreciation cost per hour or per hectare gets to down to their target and the trade-in can go ahead.

In terms of who makes machinery replacement decisions, Bob and his brother Daniel do the numbers and research the best deal at the time. While the majority of equipment is purchased new, trucks and other transport equipment can be picked up second-hand from auctions at a significantly reduced price in the current market.

Having scale large enough to run new equipment helps the replacement and justification equation for Bob and Daniel. They say about 6,000ha per machinery set is ideal so at 13,300ha they runs two sets.

If the business continues to expand, the Nixons would be slightly overcapitalised for a while with the introduction of a third set of plant until they reach the next 6,000ha increment. Dealership Chattel Mortgages are often used to finance new equipment purchases while anything else is financed through an all-in-one style of lending so there is no preference for paying off machinery or land purchases. It all gets paid off at the same rate.

Other advantages from scale include being able to justify owning equipment that would have to otherwise be hired or contracted. The Nixons say they are fortunate to be able to justify owning more specific equipment including a grader and side tippers. As a result, few operations are contracted out and the machinery owned is fully utilised on farm so there is limited contracting undertaken.

The Nixons currently run two tow-behind sprayers due to their cost effectiveness but if a third set of machinery is required, a self-propelled sprayer may be investigated. This would allow for sprays late in crop work when clearance is needed.

In the past, maintenance has mostly been carried out on-farm but the Nixons are finding more has to be done off farm. Ideally they would like one full-time employee to be a mechanic to keep more work on farm.

There has been a big increase in the hours front wheel assist tractors do over recent years with extensive liming programs and the increase in summer spraying on top of winter spraying, urea spreading and chaser bin work.

	Make & Model	Current Hours	Hours / year	Replacement trigger
Seeding tractors	John Deere 9460R x2	2,600	700 each	$45/hr depreciation last trade cost or 6,000 hrs
Spray tractors	John Deere 8270R x2	1,500	1,000 each	5-6000 hrs
Third tractor	John Deere 8270R	3,000	700	5-6000 hrs
Sprayer	Beverly Hydraboom 36m x2			Depreciation cost per hectare
Harvester	John Deere S670 x2	1,400 & 2,000	700 each	Depreciation cost per hectare, normally 2000hrs
Seeder	DBS bar + Morris 12t air cart x2			When maintenance becomes prohibitive
Trucks	Mack + Western Star road trains	500,000 & 900,000km	10,000km each	About 10 years
Other significant equipment	Finch 30t chaser bin, Norrish seed bin x 2, Bredal spreader, Side tippers, Grader, Loader, Augers			

Case study: Ty Fulwood

Location: Meckering and Tammin

Rainfall: 365mm (270mm GSR)

Soil type: Yellow sand, sand over gravel, brown loams

Cropping area: 3400ha

Crops grown: Wheat, barley, canola, oats, lupins

Average wheat yield: 2.2t/ha

Permanent labour units: 2.5

Seasonal staff: 1

Machinery investment per hectare: $522

Machinery investment as percentage of gross income potential: 84%

Ty is always open to opportunities to changeover machinery at the right price provided it suits his farming system. Operating on a 12m controlled traffic system, Ty says he'd prefer to pay a bit more for equipment that is well engineered and fits their farming system rather than do a substandard job or not last the test of time.

In the past, the preference has been to buy new machinery but these days Ty is happy to look at new and second-hand equipment in an attempt get the right gear at the best price.

For the machinery that is purchased brand new, often the manufacturers offer competitive finance rates otherwise Ty uses bank finance on a 3-5 year Chattel Mortgage to spread repayments.

In recent years Ty has invested heavily to get the right machinery to suit their operation and system. The focus is to reduce annual machinery costs, repaying debt and taking advantage of opportunities to expand. Ty generally includes a few people in decisions around new machinery purchases such as his father, employees, a mechanic and if financed then his bank manager is also kept in the loop. Ty has three permanent labour units including himself, his father and one full-time employee.

Typically the business has traded harvesters at around 2,000hrs. With their harvester having over 2,500hrs they decided to purchase an additional second-hand machine, driven by the price of new harvesters, the price of second-hand machines and the desire to run one shift only at harvest. They now aim to run the headers to 4,000hrs before reassessing.

The two main tractors are putting hours on the clock quicker than they normally would due to the farm's soil amelioration program and the addition of some contract spreading, ripping and spading.

While most operations are done internally, Ty gets contract trucks to cart most of the lime and occasionally assist during harvest. They rarely utilise other contractors but have had contract grading and Weedseeker spraying performed.

	Make & model	Current hours	Hours / year	Replacement trigger
Seeding tractor	John Deere 9410R	3,900	700	8,000 hrs
Second tractor	John Deere 8320RT	4,000	700	8,000 hrs
Third tractor	John Deere 8320 FWA	8,000	350	>10,000hrs
Sprayer	John Deere 4940 Beverley Hydraboom	2,100 10+ Years	500 100	Unsure Unsure
Harvester	John Deere 9770 (2011) John Deere 9770 (2008)	2,800 2,300	250 250	4,000 hrs 4,000 hrs
Seeder	Conserva Pak 12m AusPlow 18,000lt air cart	16,000 ha covered 10,000 ha covered		Wants to move from 12" to 10" row spacing
Trucks	2010 Freightliner road train Scania 142 Tipper	600,000km 375,000km	25,000 7,000	10+ years No plans for replacement
Other significant equipment	Volvo loader, John Deere 5090R FEL, TruFab 25t chaser bin, Bredal spreader, Farmax spader, Heliripper deep ripper, Agrowplow deep ripper, Conquest 5in1 Bin			

Case study: Grant Mills

Location: Quairading

Rainfall: 320mm (250mm GSR)

Soil type: Sand over gravel, deep sand and clay

Cropping area: 3,600ha

Crops grown: Wheat, barley, canola, lupins

Average wheat yield: 2t/ha

Permanent labour units: 2.5

Seasonal staff: Contract labour for sheep work

Machinery investment per hectare: $421

Machinery investment as percentage of gross income potential: 84%

Grant and his brother Todd strive to maintain soil structure with controlled traffic farming and have used the strategy of bigger and slower to determine their working widths of 15 and 45m.

They are working towards all machines being on 3m wheel centres, the seeder, spreader and harvester are 15m wide with the sprayer being 45m. Grant says these widths mean they have to go slower than a 12-36m CTF system but get the job done more efficiently in about the same time and with less wheel tracks.

With only 2.5 labour units Grant says their key equipment (seeding tractor, spray tractor, sprayer and harvester) has to be reliable with maintenance, which is their trigger for replacement and the reason these items are usually purchased new.

Other machinery is generally purchased second-hand and can be run into the ground or as long as it's still economically maintainable. Grant built their chaff cart and modified the air-seeder cart so says they have no resale value but have been cost effective options. Needless to say with these skills, the Mills do all their own maintenance.

Another challenge for Grant is to run a machinery set that can be moved between their three properties which are 40kms apart.

The primary goal is to be able to move everything in two moves with just three people. Hence their harvest machines consist of the harvester, truck and a movable 50t TruFab bin.

Grant and Todd are the key people involved in machinery replacement decisions. The next decision is likely to be an upgraded seeding bar and cart and potentially a tractor replacement.

For new purchases, dealer finance is often used and for second-hand equipment, a Chattel Mortgage through the bank.

In years where there is cash surplus, the first priority for the farm is debt reduction, followed by farm expansion, followed by machinery replacement.

	Make & Model	Current Hours	Hours / year	Replacement trigger
Seeding tractor	New Holland T9040	5,500	600	Replace with tracked tractor
Spray tractor	John Deere 8260R	2,000	800	7-8yrs 5,000hrs before electronics are an issue
Third tractor	New Holland loader	6,000		
Sprayer	Accuspray 10,000lt 45m			7-8yrs or reliability issues
Harvester	John Deere S680	200	300	6yrs or 1,600-2,000hrs
Seeder	John Deere 1820 bar with homemade 6t + liquid cart			Keep until unmaintainable
Trucks	Kenworth T408 road train	400,000km	16,500km	20yrs
Other significant equipment	TruFab movable 50t bin, Homemade chaff cart, Seed bin			Keep until unmaintainable

Case study: Cam Fraser

Location: Quairading
Rainfall: 350mm (260mm GSR)
Soil type: Sand – grey clay mixed
Cropping area: 5,200ha
Crops grown: Wheat, barley, canola
Average wheat yield: 2t/ha
Permanent labour units: 1
Seasonal staff: Casuals
Machinery investment per hectare: $113
Machinery investment as percentage of gross income potential: 22%

Cam proves that maintaining older equipment can be a viable machinery strategy. He says he wouldn't do it if he wasn't mechanically-minded and even then, he gets a mechanic to help him do thorough, pre-season maintenance. In most cases, Cam says this allows him to achieve the same result as a new machine but saves money which he can put towards expanding the farm.

Most of Cam's machinery is purchased when cash flow allows and only a few larger items have been financed through Chattel Mortgages. Working on his own, Cam makes his own machinery replacement decisions, usually based on the current machine no longer being serviceable.

Contractors are not generally relied upon but have been used for spraying when Cam gets behind at seeding time. For harvest Cam uses a combination of his own CAT harvester plus a half share in a John Deere 9750 with a farmer at Dowerin. So Cam gets started with his CAT and when the northern harvest is finished the John Deere is brought down for Cam to use.

As a side business, Cam owns two additional trucks and employs drivers who are kept busy with contract work year round. Cam uses an old Kenworth W924 with two trailers for farm work and occasionally gets one of his contract trucks in to help when needed.

	Make & model	Current hours	Hours / year	Replacement trigger
Seeding tractor	CaseIH STX375 Quadtrac	8,000	500	
Second tractor	Chamberlains tractors for field bins			
Third tractor				
Sprayer	GoldAcres Self-Propelled	6,500	600	10,000hrs
Harvester	CAT ½ John Deere 9750	4,200hrs 4,600hrs	500 500	Share harvest won't work for ever (will need one each)
Seeder	Flexicoil 18m bar & 1720 air cart extended to 10t			Keep until unserviceable
Trucks	Kenworth W924		31,000kms	
Other significant equipment	Water truck to fill sprayer, Norrish chaser bin 20t, 3 field bins, Terra-Gator with Norrish spreader			

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