Cutting your losses

Doug Goldie (SRUC, Barony Campus) addressed several aspects often overlooked in servicing of your combine which can lead to increased grain losses and ultimately higher fuel usage.

Doug pin-pointed key areas of the combine where grain loss occurs, detailing actions which can be taken to counteract this.

In summary, the main points are:

Header:
- Keep knives sharp and tight so they are able to cut the crop without ripping. Slack knives wear quicker and cause friction, increasing fuel usage. Genuine combine supplier knife sections are made from a better grade steel than aftermarket variants and will get a longer life span from a slightly higher initial cost.
- Be aware of setting reel too high or far back as this has an impact on crop presentation to the table.
- Ensure lifters are set tight as vibrating lifters can knock grain from the head onto stubble before entering the table. On clean standing crops it is sometimes worthwhile removing lifters.

Sieves:
- Opening sieves will reduce crop loss but puts more returns back into the tank.
- Keeping a clean pan is important improve crop presentation to the sieves. For peas, beans and rape crops the pan should ideally be cleaned daily.
Slow and steady doesn’t always win the race
Fuel costs are a major influence for harvest efficiency

Doug placed grain loss trays at several points around the combine: in front of the header, behind the header, directly behind the rear of the combine and offset to the rear of the combine to visually demonstrate 1% grain loss at each stage of the combine. This was to factor in header losses, and losses behind the combine including in the swath and the result of chopping straw. The group discussed whether or not they would accept the different quantities of grain in the trays as a yield loss with the vast majority saying no. Doug then brought the group inside to demonstrate how a yield loss within the range of 0.5% to 1% actually indicates an efficient machine as fuel costs are kept down.

In most cases, farmers reduce forward speed when trying to reduce losses, which results in higher fuel usage and more labour hours, as well as the machine being exposed to more wear and tear per hectare. Having a grain loss slightly higher than 0.5% can be beneficial to the efficiency of the operation rather than investing the extra time and money required to achieve a yield loss below 0.5%.

For Bob’s combine which is cutting an 8t/ha crop with a 25ft header, a 1% loss would be 80kg/ha. In order to count this, Doug provided the group with a grain loss calculator which accounts for yield, width of header, width of combine housing and corrects this to the thousand grain weight to give a number of grains/m². Grain loss calculators can be sourced from combine manufacturers or you can do a manual calculation. In the above situation a 1% loss would have related to 830 grains/m², assuming the straw is in the swath and not spread. In order to accurately measure losses, a grain loss tray should be placed under the machine whilst working at optimum load. After travelling over the tray, the grain should carefully be shaken from the swath lying on top of the tray and then the number of grains collected and counted.

Doug highlighted in a field scenario a 1% loss occurring in a 9.36ha field with a tonne of wheat priced at £146.35 (feed wheat AHDB July 2017), the loss would be 749kg of...
Letting off steam
How efficient is your grain drier?

Bob recently changed his drier from the Wilder 8 to a 20 tonne batch dryer to an Opico 20 tonne batch dryer. Bob’s previous dryer was running at 70% efficiency which was very good for a dryer of its age. This was mainly down to Bob’s experience and attention to detail whilst operating the dryer over the years. The biggest change of the new dryer is that the new version has the ability to run fully automatically as well as an increased capacity of 20 tonne. Bob found that last year he had been able to dry his grain much quicker than previous years which is essential in wet harvests.

John explained the principles of drying grain to the group and gave an insight into determining efficiency. Drying efficiency can be determined by two different methods; firstly by the total energy (including all electrical) per weight of water removed (kWh/kg), secondly as a percentage of the theoretical minimum calculated by psychometric charts. This can vary considerably depending on temperature, humidity and material to be dried. As a standard measure, anything around 1kWh/kg is good and anything close to 2.5kWh/kg is bad. John’s top tips for ensuring an efficient drying process were variable air flow, making sure your drier is clean and record as much information on drying batches as possible. For variable air flow, the ability to alter fan speed is preferable over closing flaps, although any method to alter air flow is preferred over no practice being applied. As the grain dries the air takes longer to become saturated, therefore a high air flow at this stage is not beneficial as heat is being lost. However too low an airflow and the air will not be sufficient to pass through the resistance of the grain. A dirty drier blocks the flow of air which reduces the drier’s ability to dry grain efficiently. By recording the grain moisture before and after drying, fuel usage, and electricity usage can be analysed and the most efficient drying settings can be determined.
Bright idea to switch to LED lighting

Marcus Stewart (Agron LED) delivered a short presentation on the benefits of converting lighting to LED technology around the steading. Marcus showed the group some of the advances in LED lighting and the lighting units which have the ability to reduce energy costs by up to 71%.

Marcus also informed the group of Resource Efficient Scotland's (RES) funding mechanism for converting businesses to LED lighting. As long as the eligibility criteria has been met and a qualifying report can show a significant energy saving based on usage, then RES can offer a 4 year interest free loan to pay for the conversion.

These savings are all dependant on lighting usage and in cases where only occasional usage is required, then the advice was to consider opting for LED lighting as and when old units or bulbs become faulty.

On the day, Marcus highlighted the difference between LED bulbs and conventional filament type bulbs. On the right of the unit there is a 150W filament and on the left there is a 15W LED bayonet replacement. The unit demonstrated that lighting output was equivalent between the two bulbs. However the LED replacement only drawing 13.9 Watts in comparison to the filament drawing 157.7 Watts. This can have a big impact to reducing a business’s energy costs especially if usage is high.

What’s next?
The next meeting will be on the 26th October, on the topic of controlled traffic farming and GPS technology.

Meetings are free to attend and all farmers are welcome.

For Castlemains, contact farm facilitator Mary-Jane Lawrie on 0131 603 7523 or via email at mary-jane.lawrie@sac.co.uk for more information.

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