

Decanter - Husbandry Guidelines

When it became clear that Decanter was becoming a major variety in Scotland we felt that growers needed to know how particular management techniques would effect two important parameters in barley purchase contracts - Grain size and nitrogen content. These characters have the potential to incur penalties for the grower at intake, or even rejection. With the malting premium representing around 15% of the final crop value, meeting specification has never been more important. Other agronomic studies give sound crop management advice for spring barley, but few (if any) studies focussed on achieving quality specifications on a specific variety.

As breeders, traditionally our role has been to create improved yield and quality in the broadest sense, and Decanter is no divergence from this tradition, yet careful selection for particular quality traits gives it unique attributes in the distillery. For many years Nickerson barley breeders have operated field trials in Scotland, we come and sow, record agronomic and disease traits, and finally combine the plots ourselves. The yield, disease and agronomic data collected from these trials was crucial in identifying Decanter's potential, and continues to help us select improved material under the uniquely Scottish conditions. These are however, primarily yield trials and agronomy work, especially for Scottish growers is a specialist area, so we needed a partner.

SAC Scottish Agronomy were approached and co-ordinated an extensive trials set, that involved grain merchants and end users, to address the question of crop management for grain quality. The foot and mouth outbreak restricted the choice of sites and a wet spring delayed sowing, but Decanter's relative performance reflected Recommend List Trials data so the results can be viewed as representative. This summary presents one year's results only, and we continue our collaboration in 2002 to ensure that the trends identified are valid over different seasons.

So these guidelines are not of the traditional type, our focus was entirely concerned with those factors which improve the marketability of the crop so unfortunately the effects of different fungicide applications etc are not reviewed. Interestingly a full comparison between fungicide chemistries was included in the trials, but no significant differences were found in the grain quality from application of one chemical/rate over another. Whether this was a seasonal effect or truly the result of the chemistry having minimal effect on either grain nitrogen or size in Decanter remains to be seen. There was little disease pressure in these trials.

Decanter markets

There are three almost distinct nitrogen bands for malting barley purchasing in Scotland, low for malt distilling, high for grain distilling and mid-range for brewing/export. Whilst Decanter is required for all three markets - part of its unique marketability - the grower should consider carefully his options and target his husbandry for one market. The factors that influence which market to aim for are often complex, but considering local intake specifications, soil type and fertility might make one type of husbandry more appropriate than another.

All three markets have a grain retention (sieving) specification, and in common with the majority of varieties on the Recommended list Decanter has the potential to produce screenings. The size of penalty or even retention specification can vary so having read the following summary and seen how seed rate, nitrogen and other factors affect grain fill, the grower can form a judgement on how to approach Decanter management.

Comparative performance of Decanter and Optic - source NIAB

	Decanter	Optic
Yield (treated)%	100	100
Grains % <2.5mm	12.3	9.4
Grains % <2.25mm	2.8	2.4

The trials

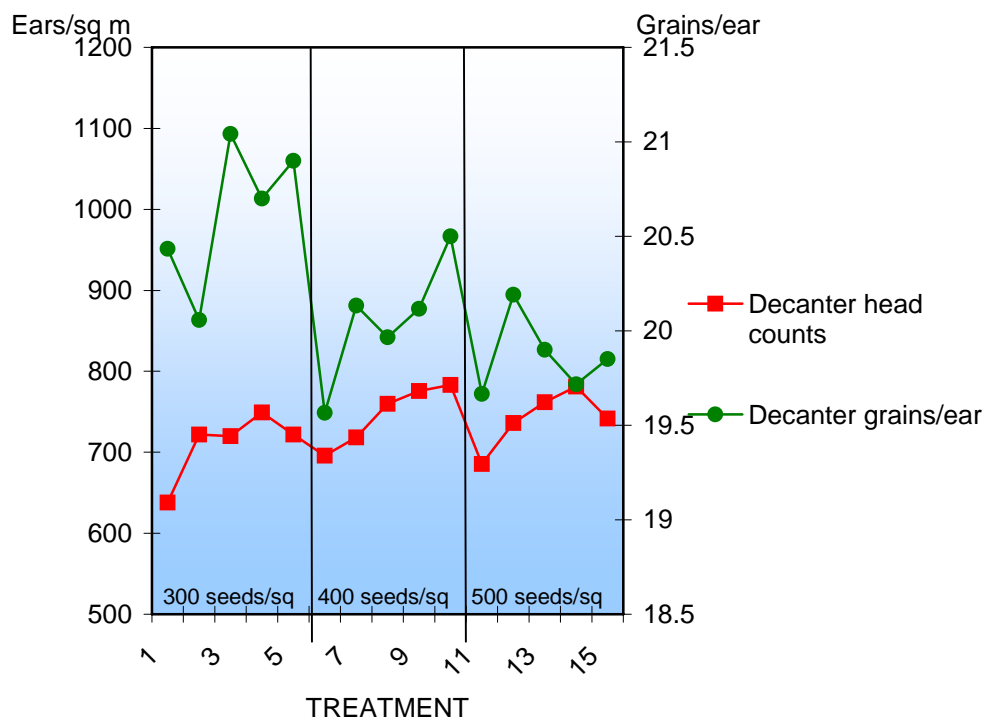
Fertilizer/seed rate/nitrogen trials were carried out at five locations, as were the fungicide trials, the effects of manganese treatments and combined drilling were examined at two sites only.

Yield components

Yield is composed of ears per unit area x grains per ear x weight of grain. It was interesting to see that Decanter produces more ears per square metre than Optic but with less grain sites per ear, this relationship is relevant in interpreting response to different management techniques. Its high tillering potential is important in understanding how Decanter responded to some of the management techniques considered.

How these components interacted with seedrate and nitrogen input is shown in the graph below.

Decanter yield components



Treatments 1, 6 and 11 = 110 kg/Ha

2, 7 and 12 = 135 kg/Ha

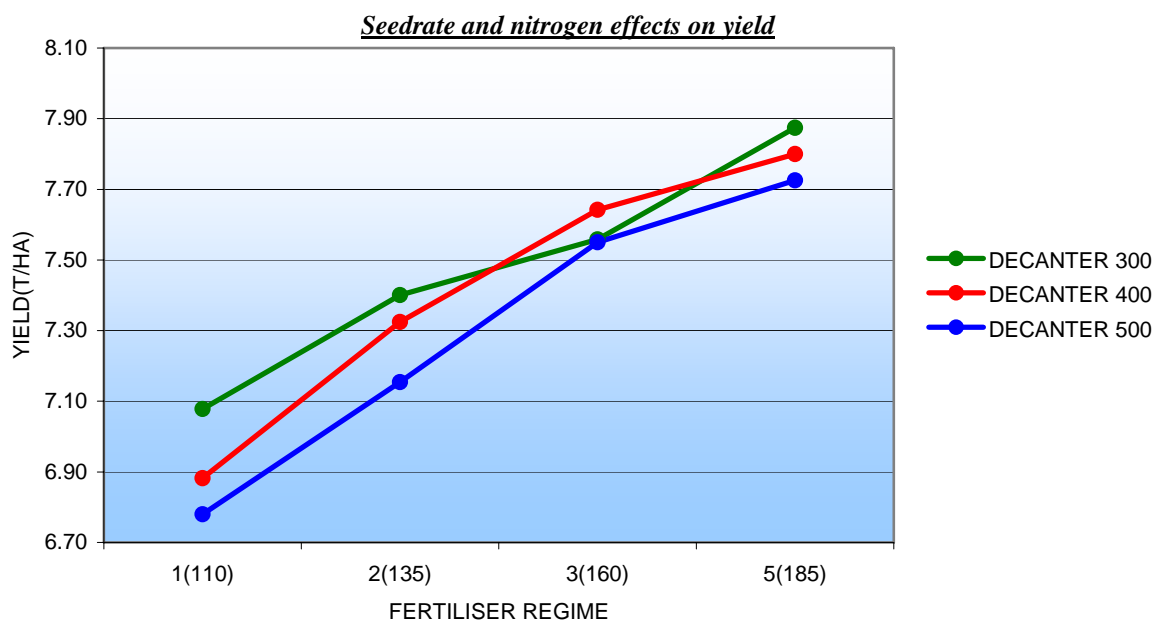
3, 8 and 13 = 160 kg/Ha

4, 9 and 14 = 160 kg/ha split application

5, 10 and 15 = 185 kg/Ha

Nitrogen and seed rate

The effects of five nitrogen treatments were examined in combination with three seed rates. The graph below shows a clear trend of decreasing yield with increasing seedrate, this is more pronounced at lower nitrogen applications. In high seed rate situations this suggests that the high tillering capacity is resulting in over competition within the crop.



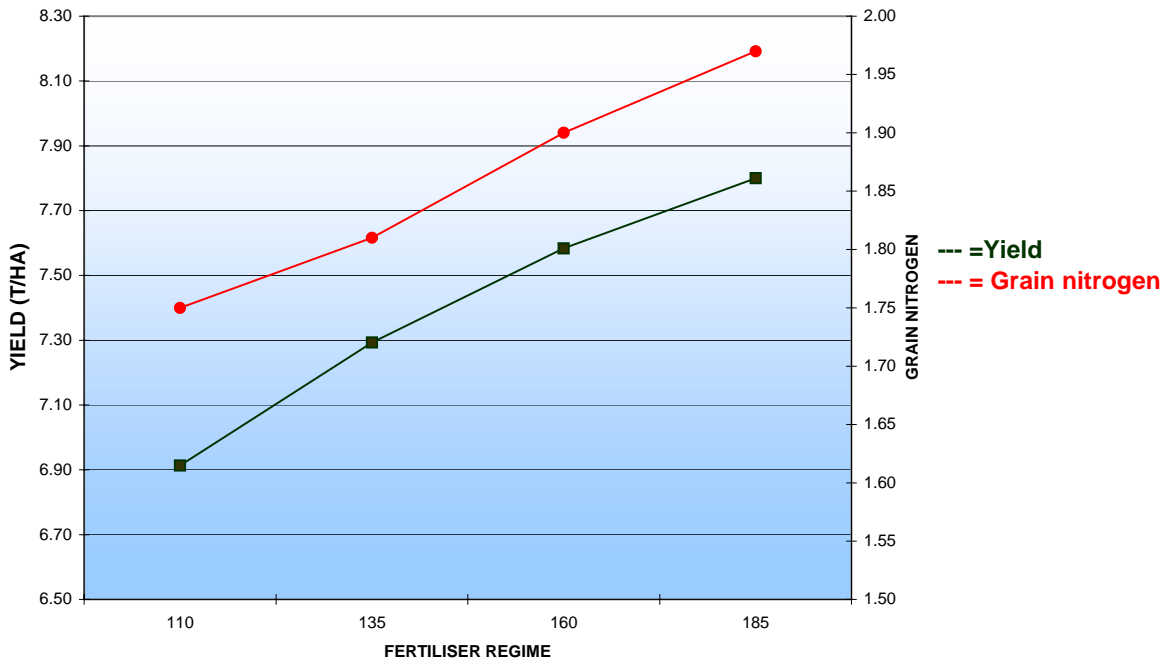
As with every aspect of this work the effect of these inputs on grain size and nitrogen was also examined.

The SAC trials confirmed that Decanter generally finishes with higher grain nitrogen than Optic and in many trials and seasons we find this to be the case. In terms of grain nitrogen for a given input in a set of trials Decanter will generally fall mid way between Chariot and Optic. This information should be useful for growers who have experience of these varieties in their own situation.

Unsurprisingly both yield and grain nitrogen increase with higher fertilizer inputs.

The effect of nitrogen input on yield and grain nitrogen

RESPONSE TO FERTILISER - YIELD AND GRAIN NITROGEN

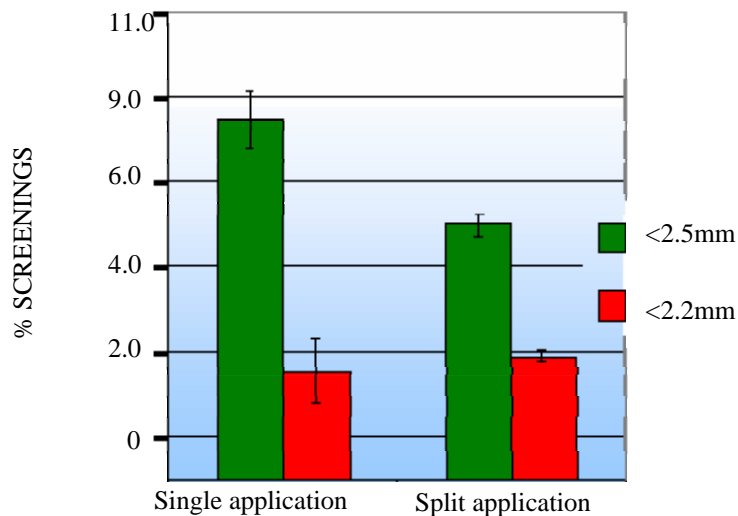


Nitrogen timings

SAC found that fertilizer timing effected grain fill when growing for the high nitrogen market. The graph below shows how the plots subject to a split application showed a decrease in screenings production over plots which received their full fertilizer application pre-emergence

The following graph shows grain size results from plots receiving 160kg/ha application of nitrogen as either a single Pre-emergence application or as a 110Kg/Ha pre-emergence plus a 50kg top dressing at GS 26-30.

The effect of nitrogen timing on screenings



Manganese treatments

From the limited trials data gathered it appears that manganese deficiency can affect grain fill. Manganese deficiency in the crop can be due to either a shortage in the seedbed or lock up effects associated with other factors. Either a manganese seed treatment or spray application could be beneficial in situations where manganese uptake is likely to be limited.

Summary

Identify your target market and adopt a suitable management approach at sowing. Sow by seed number rather than weight.

Decanter is a high tillering variety and whilst yield and grain nitrogen respond to increased N applications, high seed rates, especially combined with low inputs should be avoided as yield potential in these circumstances may be reduced.

If growing for malt distilling carefully consider of site fertility before applying pre emergence nitrogen as Decanter generally finishes at higher nitrogens than Optic in identical situations. For grain distilling contracts a split application of nitrogen may help to avoid the increased screenings normally associated with high input management.

Aim for good establishment e.g. combined drilling as this helps to achieve uniform tillering which reduces screenings. Sow Decanter as early as possible this will help the crop to finish fully.

Consider manganese availability as early results suggest beneficial effects on both screenings and yield from manganese seed treatments and manganese programs.