Evaluating the economic performance of grass varieties

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Introduction In Ireland 80% of the agricultural area is devoted to pasture, hay and grass silage. Dairy systems target calving to coincide with the onset of grass growth in spring. In the main grazing season animal production is achieved through an almost entirely grass based diet, with excess forage harvested and conserved as silage and used as the main feed source during the winter. Due to the high dependency on grass, varieties are selected on the basis of seasonal DM yields, adequate silage yields and mid-season quality. The economic value (EV) of an individual grass variety across a full production year has not being classified due to difficulties in quantifying the economic change in seasonal yield and quality parameters. Such a development to define the economic difference between grass varieties would guide the industry in selecting grass varieties that would significantly improve farm profitability.

Material and methods To derive the economic value, the Moorepark Dairy Systems Model (Shalloo *et al*., 2004) which provides a comprehensive simulation framework integrating biological, physical and economic processes in a model of a 'typical' dairy farm, was used to simulate herd parameters, nutritional requirements, land use, inputs and outputs. Economic values were derived by simulating a physical change for reach trait of interest independently and calculating the effect changing that trait has on the model output (Table 1). Each EV, expressed through the unit of measurement appropriate to each trait, was calculated as:
(net margin per ha) ÷ (unit change in trait of interest). A base milk price of 27 c/l was assumed.

Table 1 Economic value per unit change in each trait of interest: DM yield, quality, persistency and silage yield

€/ kg change in DM yield			€/ unit change in DMD per kg						€/ %change/ha/yr	€/kg DM change in silage yield	
Spring	Summer	Autumn	Apr	May	Jun	Jul	Aug	Sept.	Persistency	1st cut	2nd Cut
0.27	0.03	0.16	0.01	0.02	0.02	0.02	0.02	0.02	4.96	0.09	0.06

Results The EV for spring DM yield is based on the financial benefit of a 1kg increase of grass DM yield in the spring. An increase in grass growth and hence increase in grass available to the cow reduces the requirement for silage or concentrate during this period with no effect on milk production. The EV for autumn DM yield is based on the same principal as that for spring yield. The lower EV for summer DM yield occurs as a result of grass not being limiting during this period, therefore each kg increase in DM yield is less valuable to the system. The EV for quality expressed per kg DM, is based on a 1% change in DMD and is calculated on a monthly basis. The EV for silage is based on a kg increase in silage DM yield above the average of all varieties for both 1st and 2nd cut. Based on a 10-year reseeding plan any variety which has a shorter lifespan and is therefore less persistent will result in a decrease of €4.96 per % change in persistency per ha per year. The EV of 10 varieties are shown in Table 2, excluding persistency. Persistency is currently reported as ground score which does not provide a realistic assessment on the persistency of a variety.

Table 2 Economic values applied to a grazing system based on data measured at Moorepark

	€ DM yield			€ % DMD	€ DM yield silage		€/ha per year
Variety	Spring	Summer	Autumn	Quality	1st cut	2nd cut	Total economic value
Bealey	121.3	9.0	16.0	101.3	-28.6	-1.9	217
Dunluce	50.4	5.4	-17.6	111.9	24.2	35.5	210
Tyrella	70.5	8.0	21.9	29.4	10.2	-1.5	139
Greengold	31.3	-5.9	-34.3	77.6	22.6	29.1	120
Navan	-4.0	-3.9	4.8	107.9	-2.5	17.9	120
Malone	38.2	-7.3	-33.2	31.3	31.7	-1.9	59
Aberdart	-10.3	5.6	42.6	-19.5	-1.7	-32.1	-15
Foxtrot	-87.3	4.8	30.0	-59.8	20.8	0.3	-91
Twystar	-87.6	-3.4	11.6	-115.5	-11.7	-17.6	-224
Corbet	-128.7	-10.8	-27.5	-128.9	-34.1	-11.9	-342

*No persistency data is available and therefore persistency is excluded from the calculations.

Conclusion The index will provide clear guidelines to farmers on the total merit of each variety to their system. The objective is to introduce an EV for every variety published on the National Recommended List for Grass Varieties in conjunction with the Dept. of Agriculture, Fisheries and Food, thus providing a tool to ensure the farmer have more confidence in choosing varieties that are suitable to their system as it allows a direct comparison between varieties using a common currency (€). Work to develop an accurate estimation of persistency is ongoing at Moorepark.

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References

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