



# Is clover part of your expansion strategy?

## Clover and dairy cow genetics performed at Clonakilty Agricultural College

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**H**igh genetic-merit breeds and crossbreeds at Teagasc Clonakilty have been managed extremely well, and delivered excellent milk and reproductive performance over the past three seasons. While I admit to having been a sceptic initially, the performance of the cows grazing on the high clover-content swards makes for a compelling argument to use the plant in dairy swards. In this article, I'll summarise the first three years of analysis led by researcher Brian McCarthy and farm manager Fergal Coughlan at the college.

### Dairy herd performance

Three different breeds/crossbreeds are being evaluated at Clonakilty. These are: pure Holstein Friesian (HF), first cross Jersey X Friesians (JEX) and three-way crosses (3way) that are 50% Norwegian Red, 25% Holstein Friesian and 25% Jersey. The September 2016 EBI and sub indexes are presented in Table 1 below.

The data in Table 1 shows that the three groups of cows are all of high EBI, compared with the national average of €66. All three groups are negative for milk volume kg, particularly the JEX, but all are positive for milk solids kg.

Yield of milk solids did not differ statistically between the breeds. Concentrate input averaged 340kg/head/annum, so overall milk solids

yield was excellent for the cows all stocked at 2.75 LU/ha. On an A+B-C system the milk from the JEX group was worth €40 more than that from the HF group, with the 3way group intermediate.

Fertility is the other major driver of profitability in spring-calving herds, with excellent performance observed for all three groups of cows at Clonakilty.

No difference was recorded for all measures of fertility in Table 2, apart from pregnancy rate to first service – which was higher for the JEX than for either of the other two groups.

The weight of the HF cows at Clonakilty was greater than that of either of the other two groups, and the milk solids yield per 100kg liveweight was greatest for the JEX cows.

**Table 1:** September 2016 EBI and sub indexes of the three breeds/cross breeds at Clonakilty

|      | EBI  | Milk | Fertility | Calving | Beef | Maint. | Health | Mgt. | Milk (kg) | Fat (kg) | Protein (kg) |
|------|------|------|-----------|---------|------|--------|--------|------|-----------|----------|--------------|
| HF   | €102 | €27  | €41       | €32     | -€9  | €7     | €0.0   | 41.7 | -4        | 6.0      | 3.2          |
| JEX  | €111 | €40  | €27       | €33     | -€27 | €35    | -€1.2  | €4.4 | -164      | 9.8      | 2.3          |
| 3way | €128 | €33  | €48       | €38     | -€14 | €21    | €1.2   | €1.1 | -127      | 6.5      | 2.2          |

**Clover**

The white clover study at Clonakilty is now starting its fourth year. Four treatment groups are being investigated at this former tillage unit. Diploid or tetraploids ryegrass swards with or without clover are being trialled with equal numbers of the cow breeds tested above. All swards were stocked at 2.75 cows/ha. The results of the first three years of the study are presented in Table 3.

A grass-clover system receiving 250kg N/ha produced an extra 1,467kg DM/ha in comparison with a grass-only system receiving similar N.

The pasture production profile of a grass-clover system is significantly different to that of a ryegrass-only system: similar pasture growth rates from February to May, higher pasture growth rates from May to October and lower pasture growth rates over the winter period when compared with the grass-only systems.

The same grazing management practices developed for ryegrass pastures are equally applicable to grass-clover systems. However, during the first grazing rotation in spring, at similar high stocking rates, there will be a requirement for an additional 150kg of silage DM/cow for the grass-clover system.

White clover content averaged 26% in the Clonakilty study: low levels in spring (<10%), increasing to a peak of 40-50% in late summer/early autumn.

In the study, perennial ryegrass ploidy had no significant effect on milk production, pasture DM production or clover content.

Animal performance has been consistently high in the grass-clover systems at similar stocking rates: +58kg of MS/cow higher.

White clover can be incorporated in grassland either by direct reseeding or over-seeding using a recommended medium leaf size cultivar. It's important that established perennial weeds are controlled prior to establishment and post-establishment using a white clover-friendly herbicide to control seedling weeds.

The incidence of bloat was associated with pastures with clover content of > 50%, low sward DM content and cows with an excessively high appetite when introduced to fresh grass-clover pastures. In the future it will be necessary to develop grazing strategies that avoid pastures with excessively high or low clover content.

The results of these studies indicate that incorporating white clover into ryegrass pastures has the potential to reduce costs (lower N input), increase animal performance (increase milk production per cow) and improve environmental sustainability (reduced nitrous oxide emissions).

**Table 2:** Three-year average (2014-2016) milk production, fertility performance and weights of the three breeds/crossbreeds at Clonakilty

|                                       | HF          | JEX         | 3way        |
|---------------------------------------|-------------|-------------|-------------|
| <b>Milk production</b>                |             |             |             |
| Milk solids yield (kg/cow)            | 455         | 466         | 448         |
| Fat % / protein %                     | 4.43 / 3.64 | 4.76 / 3.79 | 4.71 / 3.80 |
| <b>Fertility performance</b>          |             |             |             |
| Calving to conception interval (days) | 95.6        | 95.0        | 97.0        |
| Pregnancy rate to first service (%)   | 60.0        | 74.8        | 57.1        |
| Six-week in-calf rate (%)             | 81.3        | 86.1        | 77.2        |
| Empty rate (%)                        | 6.7         | 5.9         | 6.0         |
| <b>Liveweight</b>                     |             |             |             |
| Annual liveweight (kg/cow)            | 531         | 480         | 496         |
| Kg MS / 100kg LWT                     | 86          | 97          | 90          |

**Table 3:** Sward and milk solids production of cows grazing clover and grass or grass-only swards (2014-2016)

|                                       | Grass + clover | Grass only  |
|---------------------------------------|----------------|-------------|
| <b>Sward production</b>               |                |             |
| Annual dry matter yield (T DM/ha)     | 17.0           | 15.5        |
| Clover content (%)                    | 26.0           | -           |
| Pasture disappearance (kg DM/cow/day) | 16.5           | 15.5        |
| <b>Milk production</b>                |                |             |
| Milk solids yield (kg/cow)            | 486            | 428         |
| Fat % /protein %                      | 4.63/ 3.73     | 4.65 / 3.76 |
| Lactating liveweight (kg/cow)         | 507            | 499         |



Farmer  
FOCUS

Pat Walsh, who farms near Durrow in Co Laois, sees the addition of clover as a way to potentially increase the intensity of production from his grazing platform: "There was clover grown on the farm in the distant past and our light land should suit clover, so we are reseeding with clover in the mix now. "I'm working with my local Teagasc

advisor Fintan Monahan and Mike Egan from Moorepark and we are optimistic we can gain another 50kg of milk solids per hectare as a result of incorporating clover." Pat's herd of 165 cows grazes on 125 acres. Last year, each hectare of the milking platform yielded 18.5t of dry matter. "We are highly stocked and clover should help us to produce even more from the land we have."