Irish Grass Mineral Analysis Report – February/March 2020

Thanks to storms Ciara, Dennis and Jorge during the month of February in Ireland we experienced prolonged periods of heavy rainfall which resulted in extensive flooding across the country. It was recorded that certain places had 1.5 to 3.3 times the normal monthly rainfall for February.

Rain leaches alkaline elements including calcium, magnesium and potassium from the soil into runoff water, leaving acidic elements such as aluminium and manganese to replace the bases. Almost all grasses sampled in the early spring season – end of February/ beginning of march were deficient in calcium and contained very high levels of aluminium, manganese, iron, sulphur, and molybdenum.

Calcium across the samples may be low as a result of the acidic soil, these types of soils are often poor sources of trace elements, best action is to test soil pH and treat accordingly. Acidic soils as a result of high rainfall and soil contamination indicated a high level of aluminium in the grass tested – this can depress phosphorus absorption and cause energy deficit in livestock; therefore, phosphorus supplementation may be necessary. Uniblock's herdminder bucket lick would be a good way to increase phosphorus levels to help fertility post calving. It is important to note that high levels of manganese in the grass can sometimes result in a depression of zinc and iron absorption in ruminants.

We are observing average potassium levels across the grass samples, it should be noted that none of the fields sampled in Feb/ march had received any slurry or fertiliser. Because potassium is an antagonist to magnesium, recommendations have been put in place (EBLEX, 2008) that the potassium level in grass should not exceed 2.5%. Looking at our findings, more than half of the samples (55.5%) are above 2.5%. Two thirds of samples are showing average levels of magnesium, however the remaining third are deficient in magnesium. Ruminants have low stores of magnesium and a deficiency is generally seen as a spring issue, when grass growth is slow and during this time slurry/fertiliser/manure is spread when potassium is naturally high in grass and magnesium naturally low - this can be a problem and result in grass staggers. In addition to this, high nitrogen application and spring grass being high in protein reduces magnesium absorption in the rumen due to high soluble protein. It is recommended that cattle and sheep should be supplemented with magnesium buckets during this early spring

period, grass staggers are also more common during cold weather. Quite often a deficiency in magnesium is seen frequently around one month to six weeks post lambing. With now being a very common time for most flocks to be lambing it is vital that we are vigilant and provide supplementation to ewes during this time.

Uniblock provide a range of different magnesium supplements suitable for cattle and sheep, such as Uniblock's 18kg Economag, 15kg Super 15 bucket and Mixrite range to include 20kg Sweet Mag with levels of magnesium provided in a palatable form to ensure intakes. Ideal for use when forage sources are low (e.g. spring and autumn) to maintain dietary levels and help prevent grass staggers in dairy and suckler cows and in ewes. Mixrite Sweet Mag also contains 5% zinc to optimise immune system. Our cattle only magnesium range provide copper so therefore are not available for sheep, Uniblock High mag, herdminder which is suitable for cows post calving and Mixrite High mag product containing 15% magnesium as an aid to prevent grass staggers in cows.

The symptoms will usually be quite obvious where the ewe will appear to have poor coordination when walking, trembling, and in some cases will collapse.

All of grass samples analysed showed molybdenum, sulphur and iron levels to be in excess. As mentioned previously, this is possibly due to the effects of heavy rainfall causing soil contamination by flooding and soil runoff. Because molybdenum becomes more active when pH rises it is not advised that lime is applied to pastures

with high levels to exasperate the problem. In addition, it has been shown by Teagasc trials (Table 1) that drainage will also have an effect on levels. However, during a very wet spell it is likely that levels will be higher than desired regardless of drainage. High levels of sulphur acts with molybdenum to tie up copper in the rumen and can cause infertility. These three elements (molybdenum, sulphur and iron) are well known antagonists to copper which results in copper getting locked up and unavailable to the animal. For that reason, livestock need to be supplemented with a copper block during this time. Mixrite's Copper 5 a day is a popular bucket manufactured by Uniblock, this is a suitable product for supplementation when copper reserves are low and antagonists are high. This product contains 45% protected Copper, five different sources of copper and is ideal for growing cattle to help improve absorption and activity in livestock. It is essential for improving health, growth and fertility with grazing cattle. Help to combat Copper deficiency with Copper 5-A-Day.

Table 1: Effect of soil drainage on molybdenum content (mg/kg) in ryegrass *(Teagasc, 2017)*

Drainage	Soil Ph	Molybdenum in grass (mg/kg)
Good	6.3	2.2
Imperfect	6.5	3.1
Poor	6.5	3.9
Very Poor	6.6	13.0

It is a well-known fact that sheep can be susceptible to copper toxicity, however when sheep and lambs graze grasslands that are high in copper antagonists such as iron, molybdenum and sulphur these elements together can bind out copper from a diet. Swayback in lambs is a common occurrence if there is a lack of copper available to ewes during mid pregnancy. A poor fleece in growing lambs is a clinical manifestation of copper deficiency in growing lambs. Breed is also a factor affecting copper deficiency with hill breeds being more susceptible to issues such as swayback compared to the lowland breeds e.g. Suffolks and Suffolk crosses being more

vulnerable to toxicity. Timing of copper supplementation of ewes and lambs should be discussed with veterinarian to get the balance between copper deficiency and copper toxicity.

Iodine levels are in the low region across all samples, but this is no change from our previous samples collected in July and December. Soils are known to be low in Iodine in this country and for that reason additional supplementation alongside grazing is a good way to counteract this issue. A deficiency in iodine can result in poor fertility and neonatal calf mortality. As well as this, goitre can be an issue where there is a severe deficiency which causes a lack of thyroid hormone production and the thyroid gland enlarges.

In general, growing lambs have a greater demand for trace minerals compared to adult sheep. Because they are born with low storage reserves the effects may be seen more quickly if there is a deficiency which leads to a clinical issue. Bo Peep - A lamb creep in a lick that complements grass but doesn't replace it. Our Uniblock and Mixrite Sheep mineral products - mineral-vitamin lick fully supplemented is ideal for in-lamb ewes and lambs at grass or on high forage systems.

Met Eireann historical weather:
www.met.ie/climate/available-data/monthly-data

Table 2: Average grass mineral analysis from samples taken across Ireland from July 2019 to Feb 2020

Parameter	July	October/November	December	February
Nitrogen (%)	2.6	3.4	3.1	3.9
Calcium (%)	0.5	0.4	0.4	0.4
Phosphorus (%)	0.3	0.4	0.4	0.4
Potassium (%)	2.6	3.1	2.9	2.5
Magnesium (%)	0.17	0.17	0.17	0.22
Sodium (%)	0.18	0.18	0.22	0.34
Sulphur (%)	0.25	0.27	0.25	0.29
Copper (mg/kg)	7.4	8.9	7.9	9.7
Zinc (mg/kg)	27.6	30.2	36.6	39.5
Manganese (mg/kg)	89.6	87.0	88.6	99.4
Molybdenum (mg/kg)	1.5	2.7	2.2	3.8
Cobalt (mg/kg)	0.1	0.3	0.4	0.6
Selenium (mg/kg)	0.1	0.1	0.1	0.2
Iodine (mg/kg)	0.4	0.3	0.4	0.4
Iron (mg/kg)	185.2	399.8	442.7	569.0
Aluminium (mg/kg)	151.8	440.8	496.2	666.0

Key	Levels
Green	Low
Orange	Average
Red	High