



Breenflex liquid fertilisers: The way forward.

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Introduction

Breenflex was established in the early nineties in Crane, Ferns for the purpose of **manufacturing** the Breenflex range of liquid fertilisers. The Breenflex range of liquid fertilisers is **distributed** by **Breen Agricultural Services**, a retail (some wholesale) company, specialising in agrochemicals, established in 1983. We in Breen Agricultural Services have been working away quietly in the meantime and the Breenflex brand is now relatively well-known in Wexford and throughout the country.

We have concentrated on some areas where we have many natural advantages, such as;

1. Starter fertiliser for all crops.
2. Grass and potato fertiliser programmes.
3. Foliar fertiliser range, widely-known throughout the country on cereals, potatoes and vegetable crops.
4. Environmentally sensitive areas or farmers who are interested in protecting watercourses from contamination with fertiliser. Since the introduction of the new legislation (the nitrates directive) a lot of interest is being focused on the Breenflex liquid fertiliser range.

Breenflex liquid fertiliser has a lot to offer in this new situation where farmers will be restricted in their use of nitrogen and phosphate fertiliser. We have always had a lot to offer but the new laws mean that people will not be allowed to continue with the established practises of fertilising. **Environmental legislation is tightening at the same time as the economic return from crops is decreasing.** In short, there is now a climate for change in the way we fertilise crops.

There are some anomalies in the scheme that need to be addressed and I hope this will be done by the politicians. Even if they do soften the legislation, the changes are going to be small. This means that we must become more efficient at using fertiliser.

Our claim is that Breenflex liquid fertiliser will allow people to live with these new regulations better than any other system, i.e., this system will allow us to grow crops with high yields and high quality with fewer units of nitrogen and phosphate. In other words, it allows us to do more with less and this is what will be required for farmers to survive in the new scenario. We need to be smarter in the way we use the units allowed and minimise waste of fertiliser which also results in pollution of the environment.

So what's so different about Breenflex liquid?

1. Accuracy of application

Breenflex liquid is applied either through a sprayer or through an applicator at sowing. This means no contamination of hedgerows or waterways. This is a major advantage, even if it were no better technically than its granular competitors. The results are very evident with customers who have been using the system for some time: their field margins and hedgerows are far less lush than their neighbours and you can actually see the line where the fertiliser finishes around the margin of a field.

In the old days, there was no sanction against contamination of hedgerows and waterways, now there are many.

Breenflex liquid is a solution, not a suspension. This means that each drop contains exactly the same as the next drop and no agitation or mixing is needed to maintain the fertiliser in the manufactured proportions. To put this in granular language, Breenflex liquid is a CCF fertiliser.

This is in sharp contrast to the competition which is very often **blended granular** fertiliser. Blends are, by definition, mixtures of granules which vary in size, density, shape etc.. **Separation starts immediately** after the original mixing so that the mixture that is applied to any part of a field will always differ from the originally intended mix. Blends vary and some are better than others but all suffer from the same problem of separation.

The problem with blends gets worse when we look at the way the blend emerges from a hopper. The small grains tend to come out first, then the medium, then the large.

Then the issue of how far the granules of various sizes and weights are thrown by the spinning disc arises. The wider the bout width, the bigger the problem.

Headlands suffer due to the fact that **no overlap** occurs and the side nearest to the margin does not receive its full complement. This affects yield badly as the headland is the biggest round of the field. As above, **the problem is increased when bout widths are wide**, as they usually are with the modern machines.

CCF's are the highest quality granular fertilisers where each granule contains the same amount of each nutrient. They are a very small share of the granular market they would need to be applied through a pneumatic spreader to equal a sprayer in accuracy.

Breenflex liquid wins hands down on accuracy.

2. Chemical Differences

Breenflex liquid works on a different principle to standard granular fertilisers. The granular system is based on applying fertiliser to the soil where **each nutrient is dissolved and is broken down to simple materials** in the soil. This nutrient is then acted on and changed by soil bacteria. Much waste is involved in this process with major losses of nutrients due to leaching and lock-up by other minerals. The idea was to feed the soil and hope that the soil would have enough left over to give some to the crop. Thus, the theory was to use more. This results in the double problem of **wasted fertiliser and pollution.**

With Breenflex liquid, fertiliser is applied in a complex form and remains in that form in the soil until it is taken up by the plant. **The complex form of the fertiliser means that leaching and lock-up by other soil nutrients is minimised** and that action by soil bacteria on the fertiliser is slowed down. This means that we decide what form we want to supply nutrients to the crop. With the old granular system, the fertiliser is usually supplied in a perfectly good form but is changed to a less advantageous form very shortly after application due to the action of soil bacteria and interactions with other minerals.

This happens to a much smaller extent with **Breenflex liquid** so we have much more control over how the plant is fed. This ability to supply stabilised fertiliser **helps to minimise waste and environmental damage.** The new way is to **aim the fertiliser more at the plant and less at the soil** so the future will hold lower soil nutrient levels and improved plant nutrient balance. This will allow us to be more efficient and to grow the same or higher yields with less fertiliser and still protect the environment.

3. System Differences. Breenflex liquid is a different concept in fertiliser manufacture. First, we find out what is required and make a fertiliser plan for the particular situation. Then we manufacture the fertiliser in our local factory and include in it whatever ratio of major and minor nutrients that is required in the appropriate form for that crop situation. **We can vary all aspects of the fertiliser.** The old system is to buy a very limited number of pre-mixed fertilisers or ingredients to be blended and to try to make these fit to the local situation. The old situation developed with a background of high crop prices and low environmental controls. Price per unit was all that was talked about and the mind-set was 'if in doubt, use more fertiliser'.

The situation mimics the change in the supply of cars, going from the old Henry Ford attitude of 'any colour of Model T you like so long as it's black' to the modern situation where you can order direct from the manufacturer's website your own customised car with all the accessories required by the customer. The manufacturer then builds and delivers that particular specification of car. This is the way fertiliser can be ordered now from Breen Agricultural Services.

4. Specialised Fertilisation

Breenflex manufacture some specialised recipes to suit particular requirements. The best known of these are our **foliar N16 and N18** fertilisers which have gained great popularity in the cereal and potato areas throughout Ireland. These formulations are now part of normal

crop strategy and their fame has spread by word of mouth across the country. They offer extremely efficient uptake of nitrogen plus magnesium and calcium.

Another example of specialised fertilisation is our **calcium fertiliser** for potato crops which works very well at preventing calcium deficiency symptoms in crops of potatoes.

Starter fertiliser for all crops is a major target for Breenflex liquid. The biggest single jump in cereal yields Ireland ever got was when we went from seed-only to combine drilling. Then we got sophisticated with one-pass systems, etc., and we went away from it. This is not the way we should be going and Breenflex are supplying a range of liquid start fertilisers for cereals and maize which will give crops the start they need without the logistical problems associated with combine drilling, in short, the best of both worlds.

The sky is the limit with specialised fertilisation. This system can respond to farmers' needs better than any other but **the fertiliser system is only as good as the way it is used** and this depends on a good knowledge of soil and crop requirements so that the correct fertiliser strategy can be identified and followed. With this in mind, Breen Agricultural Services have engaged the services of **Neil Fuller of Soil Solutions Ltd.**, an agronomist who is ahead of the field when it comes to fertilising crops of any kind. Putting Breenflex technology and Neil Fuller's advice together, we can look forward to a sustainable future in farming.

The vegetable sector is growing in Wexford and they have specialised requirements that can best be answered by Breenflex fertiliser recipes applied to suit each particular crop situation,

The nitrates directive is an extremely hot subject at the minute and most definitely need changing unless it is to decrease yields and put farmers out of business. I believe that with some relatively minor adjustments we can live with these new regulations and still grow profitable crops with high quality. If, however, we stay with the old system of crop fertilisation, we will not survive

5. A Word About Quality

Now, more than ever, we have to be aware of quality in everything that we produce. It's not so much a case of premia for quality produce but more that **low quality produce will be rejected by buyers**. The best basis for any quality crop is the early development of a good, strong root system which sets the plant up for taking in adequate supplies of water and food, even in adverse circumstances.

The root system is formed early in the plant's life and yield potential is set at a very early stage in plant growth (2 leaf stage in cereals) so that the importance of early nutrition cannot be over-emphasised. This holds true for all crops, e.g., potatoes, sugar beet, cereals, grass, etc. Stop-start growth patterns lead to poor quality, unhealthy food.

Breenflex starter fertilisers have a major role to play in early nutrition of crops and the unique formulation which supplies phosphate to the seedling in combination with ammonium nitrogen and trace elements ensures that the crop gets off to the right start and sets a high yield potential. Feeding during the growing season with adequate levels of balanced nutrition will ensure a good yield of best quality produce. This feeding can consist of various forms of nutrition, mostly soil-applied and fine-tuned by foliar applications.

The old system was the blunderbus approach: keep throwing fertiliser at the crop and it will have to grow. The new approach is to **use the minimum of balanced fertiliser to achieve the required level of yield and quality**, thus enabling us to live within the law but still achieving profitable farming.

6. Future Prospects in Farming.

The sugar beet situation, Brazilian beef, low cereal prices and now this nitrates directive are combining to make the future seem terrible. It seems as if there will be no tomorrow. Farming is not fashionable at present. Food is being taken for granted. Any other industry seems to be superior to agriculture and farmers feel as if they are at the bottom of the pile. This, by the way, also holds for people in the agri-supply area. Everybody is looking around with suspicion at his suppliers and trying to screw a better deal out of him. This is nothing new. We all get sore when we are under pressure. It is part of our survival mechanism.

Looking at it from another direction, **here are a few facts**:

There is a food supply to last for 35 days in the world at present.

World population is growing at a very fast rate, especially China and India. The Chinese economy is growing rapidly and their consumption of food will dramatically increase as their spending ability increases. Remember what happened to the price of steel when they entered the market? They will be huge importers of food.

There is much talk of the impending oil crisis as fossil fuel supplies become depleted but not nearly as much talk about **water shortage** which is a much more imminent problem. Desert is growing rapidly around the world along with population growth. U.S. exports of grain are not sustainable into the future as they are using water at 1.6 times the rate it is being replaced. Food cannot be taken for granted in the long term. It is believed that water shortages may become limiting in the U.S. as early as 2025, at least five years before the oil is expected to become a big problem. We will not have a shortage of water in Ireland.

Oil prices are set to continue to rise, thus making other forms of energy more competitive. Oilseed rape, bio-ethanol and other renewable forms of energy such as cellulose bio-refineries, refining such things as miscanthus and straw look to have a bright future. This is not going to happen overnight but happen it will.

The biggest thing that the farming industry needs to guard against is this depressed outlook that is commonplace at present. Young people need to come into the industry and they will bring new solutions and new approaches provided we don't persuade them that farming has no future. Nothing could be further from the truth! Plenty of changes will be necessary and none of us likes to go out of our comfort zone but the future depends on us finding answers to the food, water and energy supply problems that are being posed now. There will be a future for those who are prepared to embrace change, whatever business they are in. The opposite is true also.

What does the Flex Fertilizer System™ means:

- **a unique fertiliser system in agriculture**
- **improves yields in both volume and quality of the harvested product**

- **flexible plant nutrition strategies based on specific crop requirements and adaptation to soil type, crop use and growing conditions**
- **full season fertiliser strategies using liquid base fertilisers and foliar applications**
- **supports sustainable farming through the limitation of the total volume of nutrients and crop protection products**
- **enables the farmer to meet the stringent EU regulations for fertiliser application**
- **allows for implementation of other ‘precision farming’ tools, such as GPS**
- **benefits soil structure, biological activity, aeration and water management**
- **improves drought tolerance of field crops**
- **offers a true innovation in crop production.1**

Getting Started With Breenflex Liquid Fertiliser

Contact Breen Agri. Ltd. - 053-9366500

We will discuss your requirements in terms of what crop situation you are fertilising and decide on issues such as which fertiliser to use and how much, method of application, storage and transport. We like to start with some knowledge of the soil nutrient situation. In many cases, we will already be dealing with you for agrochemicals through Breen Agri. Ltd., so we may have a good bit of background information about your requirements. We can help with the taking and interpretation of soil samples, if required.

If you are going to apply it yourself, we can advise you on equipment needed and we have access to a local fitter, James Kearney (087-9295235) who is familiar with the Breenflex system. James has travelled to Denmark and The Netherlands to see the system in action and is in a position to supply, fit and service sprayers and applicators. If not, we can recommend a contractor to do the job.

The Breenflex system, as the name suggests, can be applied in a variety of ways, depending on the crop requirement and the situation on the farm.

Methods of Application.

1. Soil injection. This is very common in Denmark but not used much in Ireland. With this method, the fertiliser is applied during tilling, usually on a tined cultivator prior to sowing to a depth below the sowing depth of the crop. The crop is then sowed, either with no fertiliser or with a small amount of starter fertiliser placed right beside the seed which allows the seedling to grow enough root to get to the fertiliser left in the soil at injection.

The benefits of injection are that it does not interfere with the sowing operation, thus speeding up sowing and easing logistics problems. Crop safety is another advantage. The large amount of fertiliser is safely below the seed so that burning of seedling roots by strong concentrations of fertiliser is prevented.

In Denmark and the U.S., the full season’s fertiliser is often injected into the soil pre-sowing, thus minimising labour. This is more successful than with granular fertiliser due to the fact that Breenflex liquid resists leaching and also, micronutrients can be included in the formulation. The steady release properties of Breenflex liquid mean that the crop is fed all through the growing season.

In many cases, injection is followed by foliar application of nitrogen, magnesium and sulphur plus other trace elements as required by the crop.

2. Placement at Sowing

Placement can be done in two ways.

First method

Large amounts of fertiliser can be placed **below and to the side of the seed** at sowing so that crop safety is ensured. This is the standard method of application in Denmark, Holland and the U.S. for cereals. The fertiliser is placed between every second row of seed at sowing. This method allows the use of large amounts of fertiliser, enough for the full season, if required. This system suits situations where the seed is relatively large, e.g., maize and potatoes or where availability of soil phosphate is relatively good as in a well-fertilised stubble when sowing cereals.

In situations such as cereals after lea, there may be a need to have some phosphate placed right beside the seed. The classic lea situation without placed phosphate is that the cereal germinates and develops its initial root system but still doesn't reach the applied phosphate. The phosphate cannot move and the root needs phosphate to grow, the **classic catch 22 situation**. This is a very common sight since the development of the one-pass, seed-only system. Even if there is placed fertiliser between the rows, the crop often suffers from a poor start due the above scenario.

Second method

The answer to this problem is to place a small amount of start fertiliser down the spout with the seed, thus supplying enough phosphate, coupled with ammonium nitrogen and some trace elements to grow a root system that enables the seedling to forage in the soil for all it requires for growth and development. The **limitation** on this second system is that, for crop safety reasons, the **amount of fertiliser** has to be limited, due to the fact that the fertiliser is so near the seed.

The benefits of starter fertiliser use are that, due to the small amounts used, the **problem with logistics is minimised**. Also, once the crop is started, the farmer is not tied to any system to complete the fertilisation. Granular or liquid fertiliser can be used as a follow-up soon after emergence, making this the ideal unit for placement to have on a contractor's machine where a wide variety of customers are getting cereals sowed.

No crop is ever at a disadvantage due to the use of starter fertiliser. In some circumstances, crops seem to manage fairly well without starter fertiliser while in others, the crop struggles at establishment. **Yield potential is set by the plant at a very early stage of development (e.g., 2 leaf stage in cereals)** based on the availability of phosphate at the stage when the nutrition supply from the seed runs out. Starter fertiliser ensures that the crop lays down the basis of a good yield and quality of high quality produce supported by a well-formed root system.

3. Spraying.

Breenflex liquid fertiliser is divided into two types of fertiliser.

(a) Soil-Applied Formulations

The first of these are **the soil-applied formulations**. As the name suggests, these are aimed at the soil. They scorch plant leaves and are taken up exclusively by roots.

The object of the exercise when spraying these is to hit as few plants as possible and to minimise the surface area covered by the fertiliser. The soil-applied formulations need to be applied in lines on the soil or as large, rain-drop type droplets which will run off a leaf when it lands on it. The fact that the fertiliser remains concentrated in the soil for longer means that the complex nature of the chemistry is protected from soil agents which otherwise would render some valuable parts of the fertiliser unavailable to the plant root. The whole idea is that the nutrients in the fertiliser remain available to the plant and resist lock-up so long as the complex nature is retained.

Specialised fertiliser sprayers generally have double the normal number of jets (quarter-metre spacing) and apply the fertiliser like out of a tap in a line. Thus, the furthest any plant is away from the fertiliser is one-eighth of a metre. This system works well when the crop has an established root system.

However, in situations where the root system is poorly developed for any reason (e.g., bad soil structure, recently sown crops in low phosphate soils in the absence of start fertiliser, etc.) this spacing between the lines of fertiliser may cause uneven growth.

The plants farthest-away from the line may be starved of fertiliser while the nearest plants grow well. This can occur on headlands when compaction is present or in cold, wet, biologically inactive soils. In these situations, it is better to use nozzles which break the fertiliser into drops, thus decreasing the average distance of the roots of any plant from the nearest source of fertiliser, ensuring that no plant is deprived of fertiliser for long

This means that some local knowledge of the farming system is necessary to get the best from the Breenflex system. The formulation of each fertiliser can be varied to suit different soils, crops and timings. Ideally, the farmer would be in close contact with his supplier and they should have a good understanding of what is going on in the soil. The better the knowledge, the better the chances of success are.

(b) The second option is the foliar option

With foliar fertiliser, the opposite to above applies, i.e., the fertiliser is taken in through the leaves. Instead of aiming at the soil when spraying, we need to aim at the crop leaves. Normal crop spraying jets are used, producing small droplets which do not roll off the leaf, thus allowing for absorption through the leaves of the nutrients contained in the fertiliser.

Foliar spraying is very useful for fine-tuning soil-applied fertiliser. Nitrogen, magnesium, boron, sulphur and the trace elements can be applied in foliar fertiliser. The other place that foliar fertiliser is extremely useful is when roots are not working for any particular reason. A small addition of foliar fertiliser can have a dramatic effect in these circumstances, far greater than the small amount of nutrient contained in the foliar fertiliser application would support.

It seems as if the small bit of nutrition absorbed through the leaves acts like the starter of a car and, once started to grow, the plants roots are reactivated, like the engine of the car and growth continues. Without the stimulus of the leaf-absorbed nutrient, the plant could have remained in a state of inaction, resulting in stunting and poor yields. This explains the sometimes dramatic effect which a very small dose of foliar fertiliser can have on crop growth.

Foliar nutrition is more expensive per unit than soil-applied but can produce spectacular effects when used strategically.