



ClieNFarms
Climate Neutral Farms

ClieNFarms EIP-AGRI Practice Abstracts

Reducing fertiliser application with a localised nitrogen fertilizer injection at seeding for arable crops

Marie Collard (CRA-W)

In terms of GHG emissions (both direct and indirect) and environmental impacts, reducing and optimizing nitrogen (N) fertilization is a key lever. To reach such a target, a localised injection of N under soil surface with or near the seed at sowing is a promising alternative commonly used in no-till or reduced-tillage systems. This technique has the advantages of securing N supply by avoiding loss through volatilization as well as through leaching and no runoff losses.

Moreover, it also has an impact on weeds management by fertilizing specifically the crop without fertilizing the whole soil, and thus feeding and strengthening weeds.

The N fertilizers' placement is a trade-off between the best efficiency, the limitation of the risks of N toxicity, the N's form (liquid or solid) but also of mechanical and technical feasibility. Thus, different N fertilizers placements strategies exist: in the same furrow as the seed; just below the seed line, between two lines either next to each line (6-8 cm depending line spacing); or above the seed line.

Most of the single seed drills manufacturers have nowadays the equipment for this kind of fertilization. It represents an investment compensated by the savings in fertilizers. For localized fertilization with liquid N, the equipment can be limited to coulters or discs, the purchase of a tank and a distribution system.

On figure 1 and 2, a test of localised N fertilisation at seeding is being tested for sugar beets. Here, liquid nitrogen is injected near the seed line (6-7cm) at a narrow depth (4-5 cm). The frame with the discs (in red) for the fertilization system was assembled on an existing single seed drill (in blue). On sugar beets, this technique allows a reduction of N applied by 30% to 50% compare to the standard fertilization scheme (Legrand, G., & Vanstallen, M. 2000).



Figure 1 : Banded nitrogen fertilization at seeding on sugar beets






Figure 2 : the frame with disks for the banded fertilization system assembled on an existing single seed drill.



ClieNFarms
Climate Neutral Farms



THIS PROJECT HAS RECEIVED FUNDING FROM
THE EUROPEAN UNION'S HORIZON 2020
RESEARCH AND INNOVATION PROGRAMME
UNDER GRANT AGREEMENT NO 101036822

-  cliefarms.eu
-  twitter.com/ClieNFarms
-  www.linkedin.com/company/cliefarms/
-  www.facebook.com/clieNFarms
-  www.youtube.com/@cliefarms2778/featured