Whitepaper summary

Farming for a better future

Farmers are doers. They are used to challenges. But they have never before faced such a huge challenge as climate change, threatening the very existence of humankind. And they cannot shy away from the contribution agriculture itself currently makes to the world's warming.

Global food production systems emit 35% of annual greenhouse gas emissions. And 71% of this comes from land use change emissions including agriculture. But as the world's population increases - some predict to nine billion by 2050 - agriculture will still need to keep producing the food we will all need, perhaps having to increase its output by as much as 70%. And it will have to do so in ever more extreme and unpredictable weather conditions. That in itself will be a major challenge.

But can this be done while reducing the sector's own sizable carbon footprint? The application of new technology is enabling farmers to reduce their own carbon footprint helping them gain efficiencies, for example, through guidance, recording and reacting technologies from machine auto-steer to the precise collection of data and nutrient application. But more than that, agricultural land might be able to act as a massively important carbon sink for emissions from elsewhere. The result of developing effective carbon sequestration strategies in this sector could, therefore, be a true win-win for farmers and the rest of us.

The '4 per 1000' initiative has shown how big this potential could be, estimating that an annual growth rate of 0.4% in the soil carbon stocks of agricultural soils could offset 2.4 billion tons of carbon each year, that is 5% of global greenhouse gas emissions.

So, not only can agriculture help to keep us back from the abyss of climate breakdown, its role as a carbon storage service could also create a new, profitable revenue stream for the sector. Indeed, some have predicted that the carbon credit market could generate as much as $50 billion by the end of the decade.

We already have farmers developing regenerative practices that will help store carbon more effectively, practices that also make the soil more resilient in the face of extreme weather patterns. No-till or reduced till farming,
to take one example, strengthens soil's chemical and biological properties, reducing soil disturbance and minimizing fallow periods that improve carbon retention. Indeed, some estimates suggest that conservation tilling could help sequester carbon at a yearly rate of 0.7 tons CO_2 per hectare.

Reducing soil disturbance helps preserve the carbon content gained via photosynthesis during the growing season. Also, systems in which the fallow period is minimized and where crop residue is retained helps soil increase its carbon content when vibrant soil microbial communities absorb left residues.

Conservation tilling is not, however, a total guarantee that the soil will maximise carbon storage. So, many farmers are developing other complementary methods such as planting cover crops and managing crop rotations. Cultivating crop species with higher root biomass helps store carbon in deeper layers of the soil. They are also implementing crop rotational cycles with different characteristics such as nitrogen fixing in one season and non-fixing in another, which keeps the crop residue and planting cover crops that minimize the time soil is left bare while providing the continuous input of carbon. Some estimates say we can sequester carbon at the rate of 0.88 tons of CO_2 per hectare annually using methods like these.

Better nutrient management utilizing organic fertilizers such as manure or compost can also help sequester carbon while reducing and avoiding direct and indirect emissions from nitrogen leaching or having to use synthetic fertilizers. Where there has been excessive fertilization, a reduction to more economically optimal rates is recommended. Farmers can often get better results by using new precision fertilization techniques such as the application of fertilizers based on exact crop needs, improving the timing of fertilization to match it with plant nitrogen uptake, placing the fertilizer more closely to plant roots or avoiding fertilization where possible. It is estimated that such improved nutrient management practices can help sequester 0.55 tons of CO_2 per hectare annually.

New organic fertilizers such as the charcoal-like Biochar, drawn from agricultural and forestry waste, is recognized for its positive effects on nutrient retention, soil health, and biomass productivity. There's no doubt it has the potential to enhance soil carbon sequestration thanks to its rich carbon content and slow decomposition process, which helps reduce mineralization of the accumulated organic matter in soils.

Out of crisis always comes opportunity. And farmers, peering into the near future, will be able to see how they can seize the opportunities offered by emerging carbon markets and the challenges of climate change and population growth. The scale of the emerging carbon credit trade is likely to be momentous in terms of mitigating the effects of climate change and developing new business models. Recent analysis from a UN climate taskforce estimated that by 2030 two billion tons of carbon will have to be removed through carbon sequestration projects to stand a chance of keeping the globe's warming below the desired 1.5C. Careful stewardship of the soil, an age-old farming skill, has become key to the preservation of the climate we all depend on.

Advancing Soil Health & Soil Carbon Sequestration	Decarbonizing our Operations & Products	Elevating Employee Health & Safety	Prioritizing Animal Welfare in Food Production
Reducing atmospheric greenhouse gas by capturing carbon in agricultural soils	Reducing CO_2 emissions to limit the extent of climate change	Ensuring that all AGCO workplaces protect the health and safety of employees	Leveraging technology to drive innovation for animal-based food production
			

Source: AGCO Corp. 2020 Sustainability Report

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