

New technologies on the horizon for South African soya bean farmers

By Dr Antony Jarvie, consultant to Corteva Agriscience

Seed is an effective conduit for the transfer of new technologies in agriculture. While hybrid maize seed has been at the forefront of new genetically modified (GM) trait technology rollouts, soya beans have not had the same fortune. The fact is that GM innovation is incredibly costly to develop and deploy.

It must be noted that not all new technologies or genetic improvements are considered GM. Much progress is delivered through seed via conventional plant breeding. Still, even this approach is a long-term investment that requires the support of a healthy seed industry.

Ten years ago, the industry was heading towards stagnation, but the introduction of the end-point royalty scheme has given the local soya bean sector a much-needed 'jab'.

Recent technological advances

Could the movement of soya bean into the dry western part of our summer production area be considered a technological breakthrough? It certainly could, even though this was achieved through organic growth rather than just a single jump in technology.

While we are yet to find the equilibrium between crops rotating with maize in the west, soya beans are secure in a rotation above a 1t/ha threshold. This is likely due to their growth habit and maturity class, which enables them to tolerate the erratic rainfall characterising the region. This, combined with deep rootedness, has accelerated sustainable soya bean production in rotation on the water-table soils.

New trait technology prospects

A new Corteva GM trait which will be released in industry-leading genetic backgrounds, is on track for launch in South Africa. The lessons learnt from 30 years' cultivar development in the east, along with the newer knowledge of the



Weed control is one of the most critical aspects to soya bean production.

western production areas, will be leveraged when deploying this technology.

The new Corteva technology will be available in two iterations – CE3 and E3. The premier five-gene stack, CE3, includes two Bt genes for Lepidopteran insect resistance and three for herbicide tolerance. The E3 version only has the same three genes for herbicide resistance and will be used where a refuge is required for CE3 production, or where insect protection is not required.

As with maize, the principle of protecting resistance efficacy using a refuge crop also applies to soya beans. Varieties with the same herbicide tolerance (E3) will be released to provide a refuge to the Bt cultivars (CE3), eliminating the need to manage different herbicide regimes between the Bt crop and the refuge.

In South Africa, Lepidopteran insect damage to soya bean production occurs sporadically over seasons. Consequently, conventional producers are often ill equipped to address infestations. The introduction of Bt soya beans will add another layer of production stability.

Herbicide resistance

The bouquet of herbicide resistances offered in the E3 and CE3 trait platforms substantially improves the flexibility of production systems. For over 20 years, glyphosate has offered a cheap and broad-spectrum solution. While it is still effective,

there has been growing global resistance to its usage because of overutilisation. Experts have noted that the number of weed species showing signs of resistance build-up is still low, but alternatives to this herbicide will inevitably be required.

In addition to glyphosate tolerance, E3 and CE3 varieties have resistance to a new formulation of 2,4-D known as Enlist. The Enlist formulation eliminates the volatility issues that previously plagued the use of 2,4-D.

The third herbicide resistance in E3 and/or CE3 is to glufosinate. This herbicide, exhibiting a similar broad-spectrum action, offers a viable alternative to glyphosate. Enlist, used in combination with either glyphosate or glufosinate, will significantly improve weed control prospects.

Soya bean cultivation is on the verge of entering a new era. The enhanced flexibility of production options will ease the integration of soya bean as a crop in rotation with wheat or maize. Soya beans have always leveraged economies of scale and these new trait developments will only add to producers' ability to effectively manage additional hectares and remain globally competitive. 🌱

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