

Unlocking South Africa's true potential in sunflower production

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Sunflower has a broad value chain, making it an important crop in South Africa's agribusiness sector. Sunflower seed is primarily used for the manufacturing of sunflower oil (mainly for human consumption) and oilcake (used in the animal feed sector). Most of the seed produced is marketed locally to oil mills, animal feed manufacturers and for seed.

In production volume, sunflower is the fourth largest grain crop produced in South Africa after maize, wheat and soya beans. For the period between 2012 and 2022, an average of approximately 753 000 tons of sunflower were produced per annum. What is concerning to note, however, is that sunflower production has remained relatively stagnant over the past decade.

National average yields have also remained below 1,5t/ha in most of the production seasons and have not kept up with the constantly increasing global yields. Average global sunflower yields for the past decade amount to 1,8t/ha compared to South Africa's average of 1,3t/ha. Furthermore, globally the area planted for sunflower seed production has increased significantly from just over 22 million hectares in 2000 to around 28 million hectares in the recent production seasons (FAOSAT).

Low oil content persists

A further concerning trend that has emerged over the past four seasons is a decline in sunflower seed oil content, which has had a major adverse impact on the competitiveness of the crushing industry. The oil content of sunflower seed produced in South Africa is significantly lower than that produced in Argentina or the Balkan countries.

Furthermore, cultivar trial data from international seed breeders shows that the same cultivar planted in South Africa yields a lower oil content than if planted under optimal conditions in Argentina. Whereas the industry norm was typically the delivery of sunflower seed with an oil content of 39% and higher, the oil content has dropped significantly, putting crushing margins and the overall competitiveness of the industry under pressure.

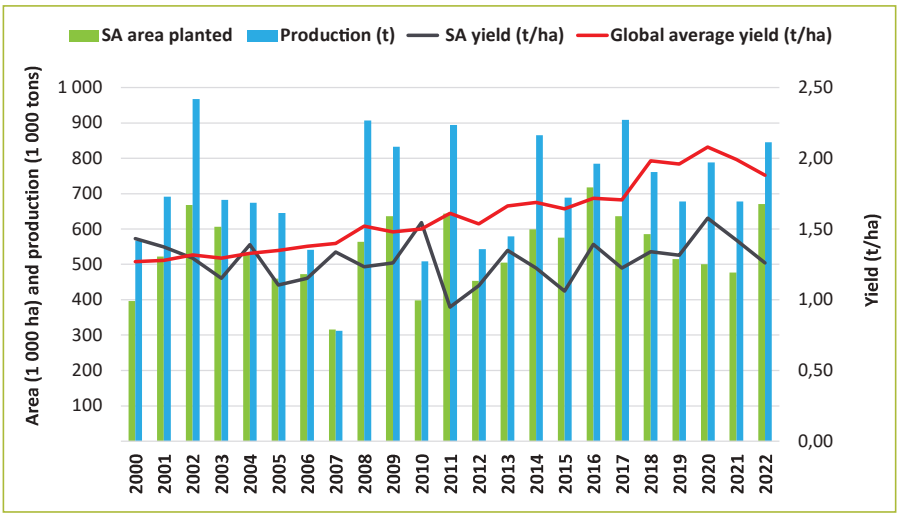
A study by the Bureau for Food and Agricultural Policy (BFAP) for the Oilseed Advisory Committee (OAC) in 2020 highlighted several key factors influencing sunflower yields and the quality of seed produced. This research has clearly illustrated that seed yield and oil content are complex, and quantitative traits that are not only controlled by many genes but are also influenced highly by environmental conditions – both additive and non-additive genetic effects – play an important role in the inheritance of seed yield and oil content.

Sound production practices

Ample evidence exists that too early or too late planting dates have a negative effect on both yield and oil content of sunflower seed, and the late plantings common in South Africa, where sunflower is mostly planted after maize and soya



Figure 1: South Africa versus global sunflower trends: sunflower area, production and yields.



bean crops have been planted, may negatively influence sunflower seeds' oil production potential.

The 2018 sunflower crop seems to be a typical illustration of this phenomenon, where exceptionally late plantings (in some cases as late as the first week in February) coincided with a sharp drop in oil content of the delivered crop. In fact, the past five production seasons (except for 2017) all had a late start, with the majority of plantings only commencing in late December and January in the major sunflower production areas.

Sunflower seed production is the predominant cash crop in Argentina and the Balkan countries, while in South Africa it is maize and more recently soya beans. In South Africa, sunflower is often planted as 'catch crop' and preference is not given to the timing of production (such as optimal planting date), fertiliser applications, soil analysis, or much of the required pest, weed or disease programmes needed for optimal production.

Thus, to achieve both high yields and a sufficiently high oil content as inherent to the genetic potential of the sunflower seed, the crop should be planted in areas with suitable climatic conditions (temperature and water stress) and optimal crop management (planting date, planting density, fertilisation) need to be implemented.

The right cultivar for the job

Currently, South African producers have a choice of 199 different sunflower seed varieties, of which 113 are classified as high oil hybrids with the potential of achieving higher than 40% oil content. All 113 cultivars are GMO free, but some have speciality traits such as specific herbicide resistance (e.g. Clearfield or Clearfield Plus) or fatty acid compositions (e.g. high in oleic acid).

From a seed breeding and plant sciences theoretical perspective, there should be a negative correlation between yield potential and oil content. However, based on a range of analyses undertaken on available data (national cultivar trial database), BFAP's study could not find conclusive evidence that a negative correlation exists between yield and oil content. To some extent, these results could have been anticipated given the wide range of external influences such as the planting date and weather that have a significant influence on yield and oil content.

Despite these inconclusive results, the fact remains that higher yields (in the case of producers) and higher oil content (in the case of processors) are critical to boosting the overall competitiveness of the industry. Most seed companies seem to be confident that with the correct cultivar selection, the average oil content of the South African sunflower crop could be significantly improved without compromising on yield in a meaningful way.

A complex situation

Overall, it comes down to the producer's willingness to adopt new high oil content seed and targeted agronomic practices to produce seed that consistently exceeds the threshold 38% (preferably more than 40% oil content), as well as the wherewithal of processors to pay premiums based on oil content, which will sustainably stimulate high levels of high oil yielding seed production, while competing with crude oil imports.

One needs to also be cognisant of the fact that these relationships (pricing structures, profitability, producer decisions) are by no means clearly defined cause-and-effect relationships when it comes to sunflower seed production in South Africa. This is because the causal relationships behind yield and oil content performance are not clear-cut and the positioning of sunflower seed in the typical South African crop mix creates additional complexities.

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