

# Soil Moisture Insurance (SMI) from Agnovate



## Background.

The landscape for agricultural input finance in South Africa is changing from traditional collateral-based lending to off-balance sheet lending. The main difference between the two concepts lies in the nature of the collateral used as risk mitigator. Off-balance sheet finance no longer utilise fixed assets as collateral. Instead, the crop itself, and its associated income stream, serves as collateral. Input finance are short-term loans provided by lenders on a seasonal basis to cover the input cost for cash crop production, mainly grain. Within the framework of the agreed lending criteria and policy the lender will advance money in a phased process during the production season based on the achievement of agreed milestones. Because the off-balance sheet lending concept no longer rely on fixed assets as collateral to loans, it is important to ensure that the entire supply chain is adequately de-risked within the three main risk areas of the farming operation:

- A. *Production Risk* can be mitigated through various crop insurance products such as hail, drought and index-based insurance.
- B. *Price Risk* can be mitigated through grain offtake agreements, forward contracts and other hedging instruments acquired on the stock exchange, also known as SAFEX.
- C. *Management Risk* can be mitigated through skilful management and controls supported by physical and remote sensing monitoring programs as well as other technology-based tools such as platforms where production related activities is recorded and monitored for optimal real-time observations.

With specific reference to productions risk, Agnovate's SMI can mitigate two distinct risk periods in the crop production cycle which were never before deliberately covered by the traditional drought insurance products such as MPYI and MPCl.

1. **The risk of adverse planting conditions.** Crops must be planted withing a specified calendar window. For planting to commence, the soil moisture levels in the ground must be conducive for seed to germinate and emerge. In case conditions are not conducive for planting by the planting cut-off date for the specific crop, and the farmer decides to continue planting, the crop is likely to fail. This poses a financial risk for multiple supply chain stakeholders, including lenders and other input providers, because a substantial amount of the funds have already been spent on soil preparation and the acquisition of input supplies such as seed, fertilizer and chemicals. In this instance, Agnovate's SMI provides protection against losses incurred before the crop, that is supposed to serve as collateral, is planted.
2. **The mid-summer drought period,** which can occur from early January to the middle of March, is well known to all summer crop producers. During this period, the plant's demand for water is very high in order to sustain its physiological development needs in terms of its advanced growth stage. In case of a severe mid-summer drought a shortage of soil moisture leads to plant stress and eventually a decline in potential yield. Agnovate's SMI provides protection against potential loss of revenue because of subsequent yield loss as a result of drought related stress.

## How Soil Moisture Insurance works.

(Below is a simplified explanation of how Agnovate's SMI works. For a detailed product description please refer to the terms and conditions set out in the policy wording)

*Risk area:* Soil moisture is measured on an index basis in an index area called a grid cell. Each grid cell is approximately 10km x 11km in size.

*Soil Moisture data:* The soil moisture data is provided by the European Space Agencies' Copernicus program with a specialised range of satellites. The data in each area is analysed over a long term of multiple decades to establish the average soil moisture for each risk period in each grid cell as well as the standard deviations (anomalies). This analysis forms the basis of the insurance model, including the insurance rate, the point at which the policy will trigger, and the values used to calculate loss payments.

*Risk Period:* A range of pre-determined risk periods is available per grid cell. The insured can select the risk period for which cover is required, for example a multiple week planting period applicable for the region in which the grid cell is located. The insured can select a single risk period or multiple risk periods according to his risk appetite.

*Insured Value:* The insured value is a discretionary monetary value based on the insured risk appetite. For example, the cost of soil preparation prior to planting plus an amount required for cashflow can be covered to sustain the business' running cost until the start of the next season, in case the drought persists, and planting could not commence.

*Flexibility:* Agnovate's SMI quoting mechanism provides extreme flexibility to meet client needs in terms of (1) levels of cover, (2) risk period, and (3) affordability.

*Soil moisture is observed throughout the risk period:* The insurer will observe the soil moisture levels throughout the risk period. A claim will trigger when the average soil moisture level (anomaly) for the risk period drops below the trigger point, as measured against the long term average (norm) for the risk period.

*Claims payout process:* The observation and administration process of Agnovate's SMI is based on real-time technology which supports a quick and easy loss payment process.

## **Pitfalls.**

*No correlation with crop yield:* Although crop yield is highly correlated with rainfall and soil moisture, Agnovate's SMI don't provide correlations between soil moisture, rainfall and crop yield, or with any other measurement. With Agnovate's SMI, the client deliberately insure stand-alone soil moisture as a tangible asset.

*Index area:* Soil moisture is measured on an index area basis and not on a farm or field basis. Likewise for claim calculations.

## **Summary.**

- Agnovate's SMI utilise open source data provided by an independent and reputable data source.
- Agnovate's SMI is almost 100% technology based with quick and transparent process'.
- Agnovate's SMI provide extreme flexibility to meet client cashflow and risk appetite needs.
- Agnovate's SMI is not only applicable for use by the primary producer (farmer). Agnovate's SMI is a perfect fit for several role players in the supply chain such as financiers, processors, storage facilities and off takers.
- Agnovate's SMI can be tailored to cover any rainfed production sector, including natural grazing.
- Agnovate's SMI is a new generation insurance product which requires a mind shift away from the traditional products.

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