

Understanding the **MAIZE MAZE**

by Dr Dirk Strydom and Manfred Venter

Many farmers believe they can only use Safex to sell their crop and hedge or fix the price they will sell at after they have planted. However, there are basic instruments on Safex yellow maize buyers can use to hedge themselves against adverse price movements. A recent study created a theoretical dairy farm that procures 100 t of maize every three months. Routine, easy-to-understand hedging strategies were applied to this scenario to test the efficiency of hedging. These strategies were repeated for 12 years annually in exactly the same way, to determine whether there were any financial benefits for using routine procurements strategies. It has to be noted that the research only focused on whether the strategies were efficient compared to when buying on the spot market.

Routine procurement strategies

There are many complex methods to use Safex to procure grain and hedge the procurer's risk against unwanted price movements. Effective price risk management strategies, as part of procurement, can give processors such as dairy farmers a competitive advantage over rivals and increase the farm's profitability. In this study, we identified two basic procurement strategies: a call strategy and a min/max strategy. We then compared them to the spot price as the baseline. The price data used for the strategies were historical price data from Safex, ranging from 2002 until 2014.

Spot strategy

The spot strategy was used as the baseline strategy to signify a situation where no active procurement strategy was used. It was assumed that the decision-maker bought yellow maize at the end of the three-month period. The strategy was not amended in terms of price management and was only used to make comparisons.

Call strategy: Buy a call option 13 months into the future

A feed miller or maize processor, who is concerned that the maize price will increase in the future, will use a call option to protect his business against unwanted upward price movements. Thus a call option is used to manage price risk and to hedge against unwanted price movements in the market. At the expiry date, the dairy farm will have the right to buy the maize at the minimum price agreed upon at a specific time and date. When the dairy farmer exercises this option, he develops protection against rising prices and has the opportunity to benefit from decreasing prices. The disadvantage of a call strategy is the effect of the premium (the cost of taking out the option) that must be paid for purchasing the call strategy.

The data used for the strategies were historical Safex prices on the 1st of May

for yellow maize. An at-the-money (option price = futures price) call option was bought and expiry was dated for the last five working days of April, one year in advance. The option cost was calculated using the Black-Scholes model, given the Safex price (at-the-money), while historical volatilities were obtained from Safex. The spot price is the alternative price when the option is not exercised (spot price + premium).

“ Effective price risk management strategies can give processors such as dairy farmers a competitive advantage over rivals and increase the farm's profitability. ”





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Hoë opbrengspotensiaal

Stabiliteit

Goeie staanvermoë

Besproeiing

Strategy min/max: Buying and selling a call option simultaneously with different strike prices

A min/max option strategy is used to lock in the maximum gain and maximum loss of a stock or commodity. To execute a min/max, a dairy farmer buys a yellow maize at-the-money call contract while simultaneously selling an out-of-the-money (option price > futures price) call option (call option with a higher strike price). Thus, the dairy farmer locks in a floor price and a ceiling price. The min/max option is also used to subsidise the call options premium. If the net price (strike + premium) in the option is lower than the price in the spot market, the option is offset. If the net futures (spot + premium) are lower, the spot will be exercised and then the price on the premium of the option is paid.

Results

The following figures illustrate the financial benefits and costs incurred when implementing these routine procurement strategies in the theoretical dairy farm.

Figure 1 gives an indication of the total purchase cost associated with each strategy over the 12-year period. For example, when procuring only on the spot market during the 2011/2012 season, the cost would have been much higher than, for instance, implementing a call or min/max strategy in that year. However, in the 2008/2009 season, it would have been more beneficial to procure from the spot market than using the options.

Table 1 Total cost incurred per strategy 2002-2014.

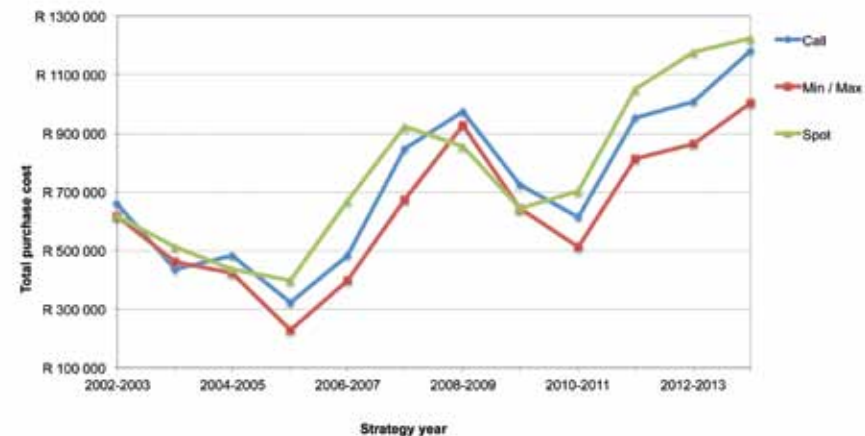
	Call	Min/Max	Spot
2002/2003	R662 714	R617 024	R618 600*
2003/2004	R435 537	R461 021	R514 000
2004/2005	R483 177	R421 973	R435 600*
2005/2006	R322 922	R227 809	R396 600
2006/2007	R481 543	R397 011	R669 400
2007/2008	R846 642	R672 543	R922 300
2008/2009	R975 594	R928 836	R856 300*
2009/2010	R724 033	R643 898	R644 900*
2010/2011	R613 086	R513 787	R703 900
2011/2012	R954 930	R813 558	R1 051 400
2012/2013	R1 008 150	R865 310	R1 177 300
2013/2014	R1 181 999	R1 004 999	R1 223 800

* Indicates where the spot market strategy was better than the call strategy.

Figure 2 illustrates the gains, losses and net gain by implementing these strategies over a 12-year period. Attention must be given to the fact that the gains were calculated using the amount paid in a year to exercise the strategy and then taking the amount paid for the strategy and deducting that from what the procurer should have paid if the farm procured from the spot market (thus the amount that the

strategy would have saved relevant to the spot market). The same principle applies for losses, where losses were calculated when the procurer made a loss by implementing the strategy where he could have performed better by procuring from the spot market. The winnings in comparison to the losses outperform the losses. The nett

Figure 1 Total cost per year, 2002 to 2014.



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gain is the total gain minus total losses over 12 years. According to Figure 2, this dairy farmer would have saved R1,6 million over the 12-year period using the min/max strategy and R524 773 using the call option.

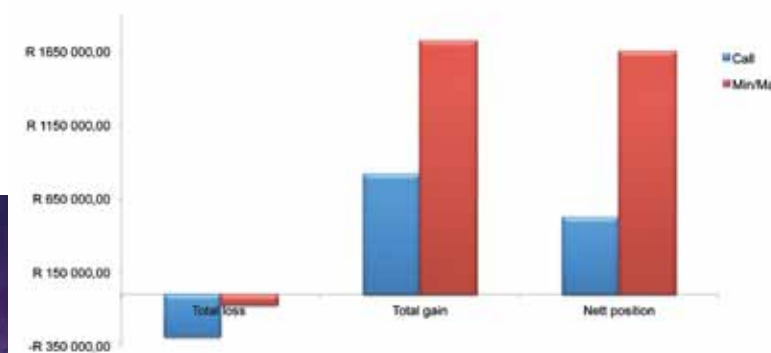
Conclusion

This study found that it is beneficial for the dairy farmer to use routine procurement strategies in the form of a call or min/max to hedge against unwanted price movements over a 12-year period, and that there would be financial benefits in doing so. It is also important to understand that you do not need to evaluate the market each year – this is a strategy you apply each year without wondering what will happen with prices.

However, it was also found that this is not a recipe for success every year; although it will deliver better returns if followed annually over the long run.

The gains you make in one year when hedging are much greater than the losses you make in a year that you hedged and the prices turned against you. This means it is beneficial to use routine procurement strategies year on year to ensure a predictable and reliable price for raw materials. The new mini contracts (10 t) make it even easier, since one can hedge according to the exact monthly procurement.

Figure 2 Total gains, losses and nett gains from 2002 to 2014.



KEY FINDINGS

- Any hedging strategy is better than no strategy.
- Normal, easy-to-understand strategies can be used to hedge the procurement of maize.
- By using routine strategies, you do not need to understand the market, and you will still benefit in the long run.
- Innovative, easy-to-manage strategies can improve profits even more.
- In this farm scenario, the farm saved between R524 000 and R1,6 million over 12 years.

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