Zimbabwean tobacco growers start adopting potassium nitrate for topdressing

Dr Steve Oosthuyse (Market Development Manager, EMEA) and Duncan Napier (Technical Manager, SQM Africa) were hosted by Grow Agriculture in visiting Tobacco Growers in the central region of Zimbabwe in late November, 2014 (Figure 1). The aim was to evaluate grower experience in top dressing with potassium nitrate, a practice not previously performed. Late calcium nitrate top-dressing at the time of topping and ammonium nitrate top dressing immediately after planting are generally practiced.

Research carried out in the past by Kutsaga (Tobacco Research Board, Harare, Zimbabwe) did not advocate potassium nitrate topdressing. Researchers argued that potassium originating from weathering of various clay minerals found in the tobacco soils of Zimbabwe was sufficient to meet plant demand. It was stated that tobacco soils of Central Africa are generally rich in available potassium, particularly in the virgin state. It was conceded, however, that prolonged, continuous cropping will deplete soil reserves of potassium in time.

Yields of 1 to 2 MT of dry leaf per ha were considered good in the past. Yields of 3 to 5 MT per ha are now expected, raising the requirements for potassium. Years of cropping and increased yields have likely depleted the Zimbabwean tobacco soils of potassium. Moreover, mineralization of potassium resulting from the partial breakdown of the clays present is unlikely to sustain demand. Tobacco fertilisation is currently based on the results of soil analysis. Potassium application in Zimbabwe is, however, far less than that which is recommended in South Africa from similar soil analysis results.

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Figure 1. Duncan Napier (left) and Dr Steve Oosthuyse (right) advising tobacco growers in Zimbabwe on tobacco fertilisation and irrigation management.

Soil analysis inspection for fields in the vicinity of Harare indicated potassium to range in concentration from 50 to 91 ppm. South Africa research indicates application of 270 kg K/ha for a 4 MT crop for soil analysis value of 50 ppm. For a 100 ppm soil analysis value for K, 250 kg K/ha is advised.

In general, 500 kg per ha of compound “6-28-23 + 7.5 S + 0.15 B” is applied in the ridges prior to planting. This equates to an application of 96 kg K (115 kg K_2O) per ha. It may be thus concluded that a marked yield benefit to top-dressing with potassium nitrate can be expected.

SQM’s previous visit to Zimbabwe in early June, 2014, prompted the application of one top dressing of 150 kg of potassium nitrate per ha 4 weeks after planting, when the “grand phase” of growth commences. Growers serviced by Grow Agriculture, owned Andre Kondonis, have in general made this application. It will provide an additional 57 kg of K, and a total K application of 153 kg K/ha: this may still be too low to achieve a yield of 3-5 MT dry leaf/ha. Top dressing with potassium nitrate as opposed to increasing the basal K level is more beneficial, since the soils are sands subject to leaching, and irrigation practices, carried out using center pivots or drag-line overhead sprinkler systems, are generally inefficient. Moreover heavy rain events

occur during the growing period, enhancing leaching.

Trials are being carried out by Dr Steve Oosthuyse to demonstrate the benefit of topdressing with KNO_3 in Zimbabwe (Figure 2). They are specifically tailored to the soil situation and current fertilisation practices carried out in Zimbabwe on tobacco.

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Figure 2. A Tobacco pot trial carried out by Dr Steve Oosthuyse to show the benefit of potassium nitrate topdressing. Differences in growth are clearly apparent. Two pot trials are being carried out.