Sustainable agriculture for the future

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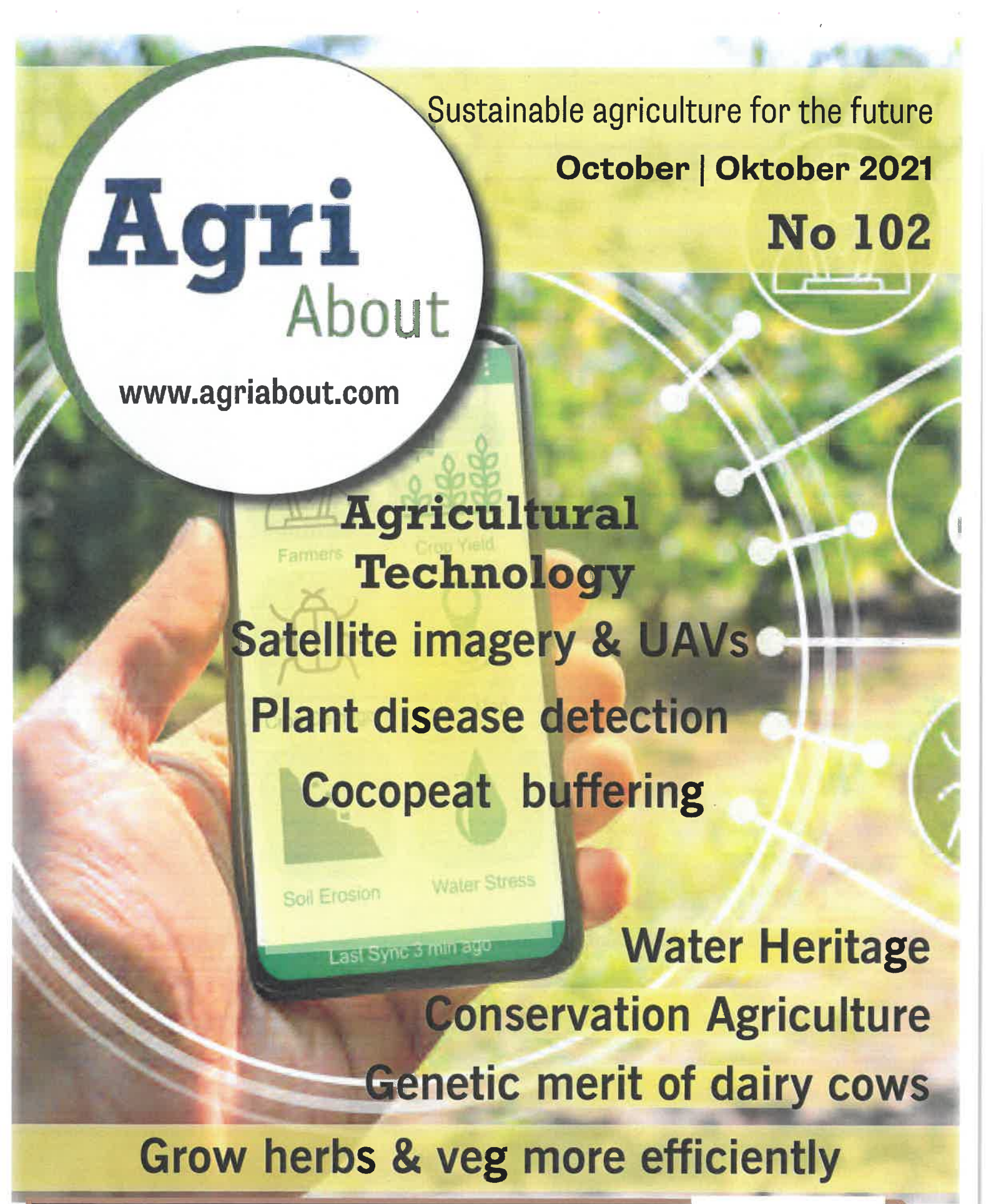

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Conservation Agriculture

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Conservation Agriculture = Healthy soils = Sustainable production = Food security

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Household food security is threatened by globalisation, international trade regimes, increased food price volatility, climate change, high levels of degradation and the poor storage and distribution of food. In the absence of co-coordinated interventions, increasing numbers of people may experience inadequate access to food, and many of the poorest communities fail to benefit from proper nutrition. Hence, secure access to food by all is not guaranteed. Specifically, KwaZulu-Natal (KZN) has the highest disease burden in the country, high incidence of malnutrition, as well as pervasive hunger and poverty that, when combined with the prevailing unemployment and inequality, presents the province with a formidable set of food insecurity challenges. This situation has thus compelled agricultural researchers and other developmental workers to ensure food and nutrition security that is sustainably produced and sourced.

Considering these challenges, the ARC SCW has in recent years embarked on the use of technologies that build resilient natural resource systems. These technologies include, amongst others, conservation agriculture (CA) that is aimed at improving soil health by building organic matter reserves through various principles. Conservation agriculture is premised on minimal mechanical soil disturbance, permanent organic soil cover, biodiversity, and integration of livestock in a production system. In managing conservation agriculture systems, it is important to simultaneously implement the various principles and practices associated with CA. Depending on the locally available resources, adaptation of certain aspects like composting of organic waste through vermiculture, intercropping, crop rotation and the use of cover crops may be integrated. Incorporation of legumes in a conservation agriculture system is an integral part of ensuring crop

Plant pot blueberries cultivation

requirements of a type of crop that needs a high number of fertigation cycles because of the low volume of the soil.

The optimum work pH, around 5.5, requires an accurate adjusting system. In fertigation solutions, the main factor affecting the water acidity or pH is the concentration of bicarbonates. As pH is a logarithmic scale, it means that decreasing one point involves having an H+ concentration ten times lower, therefore, to decrease 0.1 points we need 100 times lower volume when pH is around 5.5 than when pH is 7.5. On the other hand, the concentration of present bicarbonate and buffering capacity under 5.5 is so small that in-line adjustments should be carried out carefully if you do not want to decrease too much or go into instability. It is essential not to exceed acidification as Aluminium solubilization may produce toxicity, which stresses the need of accuracy in this control.

WATER CONTROLLER 3000 equipment allows for in-line precise pH adjustment adapting to the changes to the network flow without moving from the setpoint, because of the pH adjustment type PIQ, which constantly monitors the fertigation flow and anticipates to the changes to the acid dosing

PROPOSAL OF ITC EQUIPMENT FOR BLUEBERRIES

- WATER CONTROLLER 3000 6-24 or higher
- DOSTEC-AC independent dosing units for fertilisers (dimensions recommended for this crop 1 per thousand per each stock solution, from 2 to 5 stock solutions)
- DOSITEC dosing units for Ph control in flows lower than 40m3/h; and of DOSTEC-AC in higher flows.

Water Controller 3000 by ITC



diversity as well as enhancing a healthy community of soil micro-organisms. The results of below-ground soil health and quality are evidenced by the above-ground flourishing biodiversity which is regenerative, dynamic and a holistic agro-ecological environment for sustainable food production. The system can be implemented for field crops (grains) and vegetable production in home gardens.

The current challenges that affect food and nutrition security because of climate change is related to erratic rainfall patterns (distribution and variability), job losses in the agriculture sector, endangered honeybee species threatening crop pollination, decreased crop yields, global drought that pushes up the prices of staple foods and poor air quality damaging crops. Prior to food and nutrition access, distribution, and utilization it is important to note that the availability is solely based on primary production. Hence, land management skills are critical to proper production techniques by producers, especially smallholder resource-poor farmers in many rural areas of South Africa. It should be highlighted that the establishment of resilient natural resources should not be a financial exercise that requires expensive inputs but rather the use of locally available organic waste from both plant and animal based sources. i.e., a way of recycling and managing organic waste.

Pillars of conservation agriculture

Minimal mechanical soil disturbance should also not be financially draining. Where possible the use of hand implements or direct seeding using draught power Is recommended.

Permanent organic soil cover

Ideally, the organic soil cover should be 100% using various mulches (plant residues, green manure cover crops) to protect soil from erosion, reduce water losses and enhance soil fertility.

Diversified cropping

This will suppress weeds, pest, and disease infestation. Crop diversity addresses food and fodder requirements as well as improving soil fertility





Pictures: Vermiculture knowledge development at local level

In building resilient soils within the conservation agricultural context one must start with what is already present in building the soil as a living organism and taking advantage of the incredible work of trillions of micro-organisms, managing pests through natural practices with increased biodiversity and focusing knowledge development at the local level. Thus, conservation agriculture is regarded as a vehicle that ensures continuous efficient food production at a reasonable cost and does not compromise the productive capacity of the soil which makes it suitable for smallholder resource-poor farmers.

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