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AGRICULTURE JOURNAL
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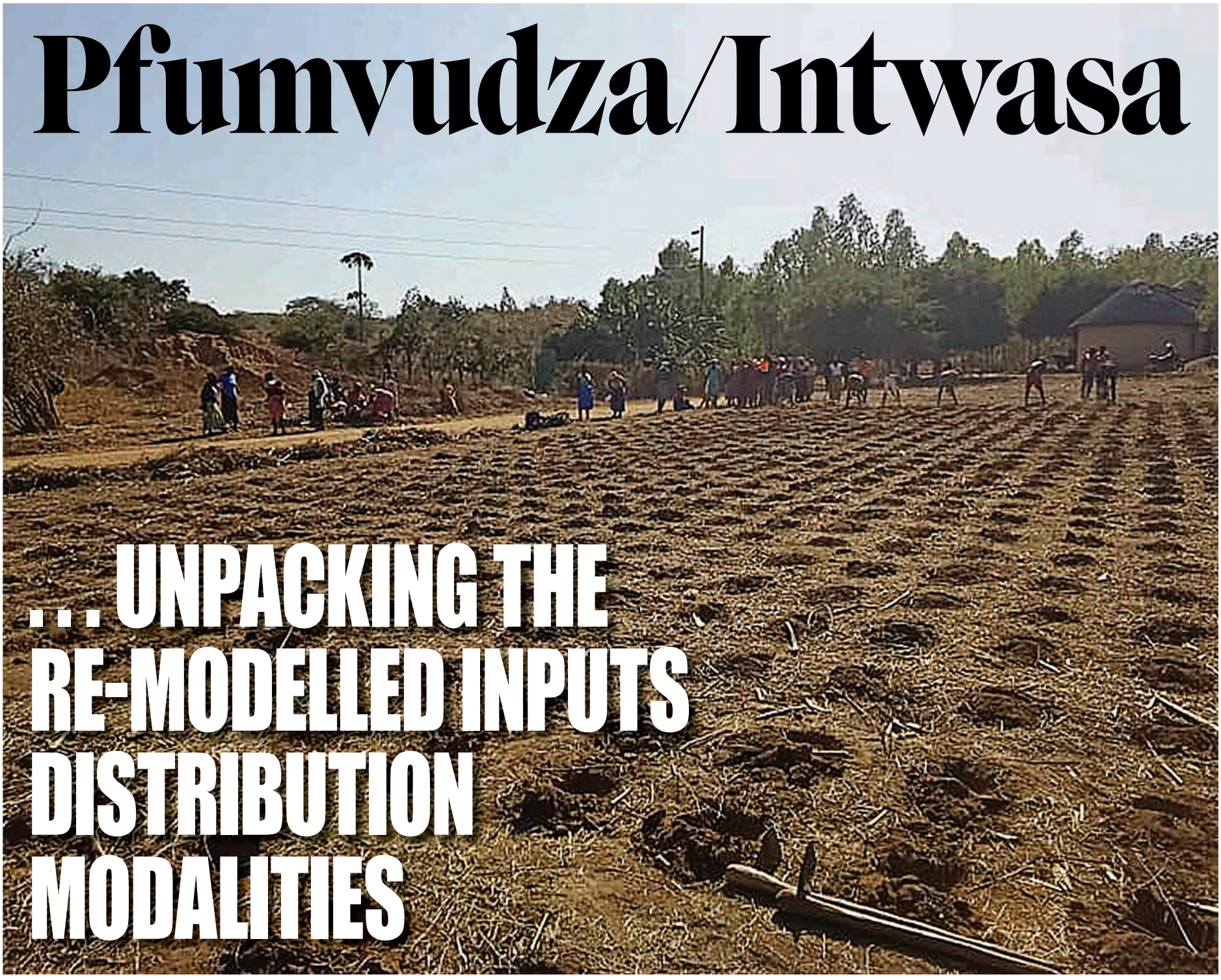
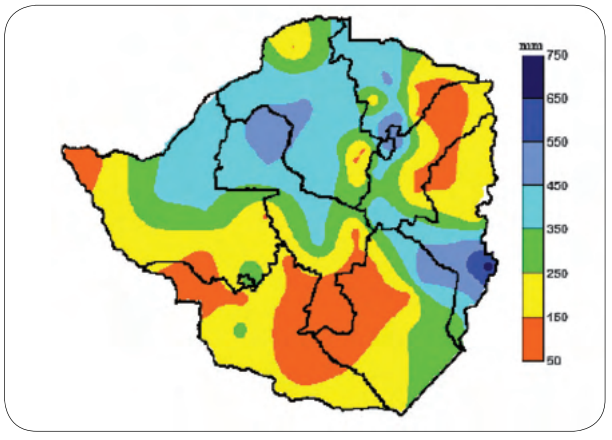
Pfumvudza/Intwasa



...UNPACKING THE RE-MODELLED INPUTS DISTRIBUTION MODALITIES



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Pfumvudza/Intwasa:

Unpacking the re-modelled inputs distribution modalities

Nester Gumbo

THE Presidential Input Programme is targeting 3, 5 million farmers in communal, A1, small-scale commercial farming (SSCF), old resettlement (OR) and peri-urban farming sectors for cereals, oilseeds, and legumes for the 2022/23 cropping season.

The programme will support 5 Pfumvudza/Intwasa plots (39m x 16 m) per farming household with an agro-ecological region-specific crop input package for maize, sorghum, pearl millet, soya beans, sunflower, groundnuts, dry beans, African peas and vegetables. The package will also include water retention enhancers, herbicides package for 3 plots as well as fall armyworm remedy.

Input distribution under Pfumvudza will be according to the agro-ecological region to maximise performance of the programme given a high possibility of erratic rains.

Farmers in regions I and II will get:
- 3 mandatory maize plots,
- 2 optional plots comprising of sunflower, sorghum, pearl millet, groundnuts, African peas and sugar beans

Farmers in region III will get:
- 2 mandatory maize plots and sorghum or sunflower plot
- 3 optional plots comprising of sunflower, sorghum, pearl millet, groundnuts, African peas and sugar beans

Farmers in region IV and V will get:
- 1 mandatory sorghum plot, 1 millet plot and 1 sunflower plot
- Two optional plots comprising maize, African peas, ground nuts, sorghum, millet.

The Government has deliberately introduced distribution of inputs according to the farmers agro-ecological region as a way of ensuring food security and nutrition for all citizens. In the past, Government programmes had limited success in meeting set goal due to minimum crop yields produced by farmers across the country.

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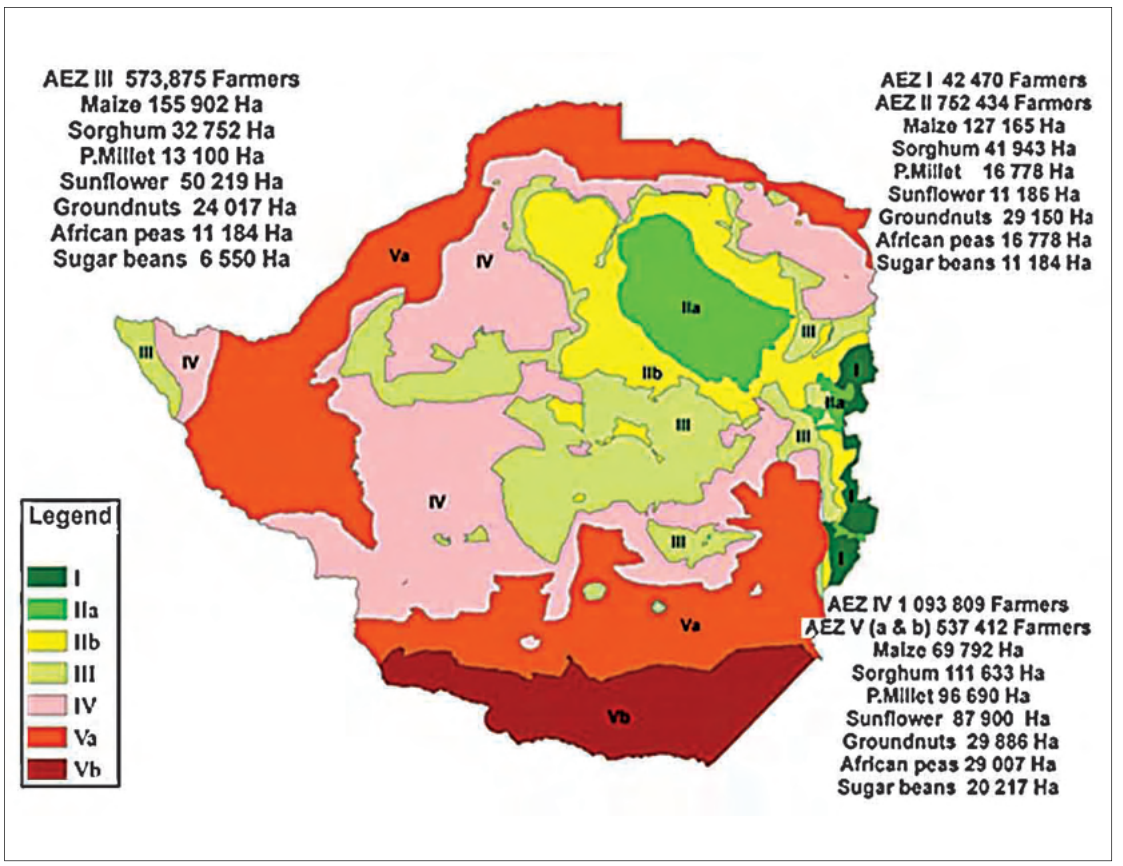


Ministry of Lands, Agriculture, Fisheries, Water and Rural Development
Agricultural and Rural Development Advisory Services (ARDAS)

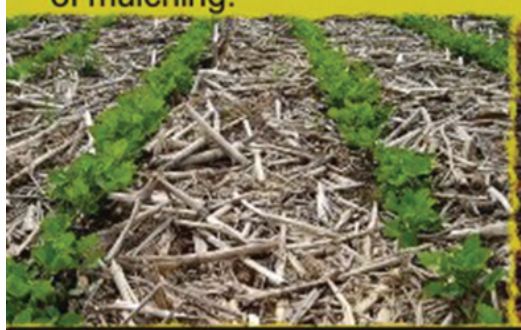
Mulching under Pfumvudza/Intwasa

Extension message to Farmers

- Mulching is one of the principles of Pfumvudza/Intwasa which farmers are being encouraged to gather and collect enough for the 5 Pfumvudza/Intwasa plots.
- Best time to collect mulching material is soon after harvesting (April/May/June) before high incidences of veld fires.
- After mulch collection, ensure fire guard around the mulching material, either heaped or spread in the fields.
- Plastic mulch is much expensive under Pfumvudza compared to other types of materials, hence can be used on smaller areas especially for backyard farmers.
- Live mulch is recommended in intercropping, where the minor crop should be of spreading type and the main crop being tall statured. The full cover by the minor crop will give full benefits of mulching.

Benefits of Mulching

- Conserves soil moisture by fulfilling the 4 standard principles of moisture conservation
- Slow the movement of water on the surface thus increasing water infiltration in the soil – reducing run off and soil erosion.
- Spread the water on the soil surface
- Add organic matter to the soil thus increasing microbial activity, hence increased soil fertility.
- Regulate temperature fluctuations by absorbing heat during the day and radiating it at night.
- Smother weed germination, growth and development since no light penetrates into the soil surface.
- Reduce crop leaves contact with the soil thus reducing soil borne diseases.



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agritex

Unpacking the re-modelled inputs distribution modalities

All regions to grow maize

● Continued from Page 2

According to the crop surveys conducted, farmers in low rainfall areas given inputs such as maize, sugar bean and soya bean performed dismally in terms of yields.

This drove the Government to adopt the distribution strategy based on agro-ecological regions in order to increase production and productivity, which lead to higher yields that secure food nutrition and security for the nation.

It is envisaged that through this strategy, where farmers in low rainfall areas will be given drought tolerant crops such as sorghum, finger millet, round nuts and sunflower for optimum yields.

Furthermore, farmers in high rainfall areas will focus on producing crops, which perform well under high rainfall conditions such as soya bean, sugar bean and maize.

However, it was noted that most people prefer maize crop for cooking the staple food sadza/isithwala to small grains.

According to the strategy, farmers will realise great harvests enough for household consumption with surplus for sale.

The excess produce will then be sold, and proceeds used to purchase preferred grain across the nation. The Government will avail transport to facilitate movement of grain from areas of low demand to areas of high demand.

Several households across Zimbabwe have received Pfumbvudza/Intwasa inputs

Opportunities for value addition and creation of new markets for products such as mahewu, a favourite beverage for many people.

In addition, there will also be production of animal feed such as soya seed cakes from simple processing of sorghum, soya bean and other crops.

The development of new rural industries will ensure improved incomes and creation of employment towards attainment of National Development Strategy 1 (NDS1) and Vision 2030.

The Government is encouraging farmers to receive the inputs distributed according to the agro-ecological regions, as these ensure their household and nation food security. In addition to household support the programme will also facilitate the Zunde raMambo/Isiphala seNkosi scheme, which will support 10 plots for the chiefs, 7 plots for headmen and 5 plots each for village heads.

The distribution of Presidential Climate-proofed Inputs Scheme will be conducted by local distribution committees.

The distribution committees will comprise locally selected members such as chiefs/headmen, village heads, Agritex officers, a local school head, party representative, SMEs ward coordinator, youth coordinator, and security sector representative as guided by the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development.

Grain Marketing Board (GMB) supply chain managers will superintend over the input distribution process in their catchment including receiving inputs at GMB depots and reconciling distribution of inputs.

● *Nester Gumbo is the Acting deputy director Department of Agritex*

AGRICULTURE JOURNAL

Editor's Note

IT is my hope that I find you traversing the terrain from the 2021/22 season to the fast approaching 2022/23 cropping term well.

This transition from one season to another will play a key role in deciding how you fare in the new season with proper planning of activities.

For now, the weather people have given you the assurance that we all needed — there will be normal to above normal rains though at different segments of the season depending on where you are situated in the country's various farming regions.

The Government too, has listened to what your agro-ecological regions' soil and climatic conditions require in terms of crop choices and will be giving input packages that match those regional requirements.

Those situated in the country's arid regions will be getting packages with more bias towards drought tolerant crops while those in high rainfall locations will get more of crops like maize.

One common thing is that all farmers will get all the crops on offer but in different quantities depending on their geographical location.

Of course everybody needs the staple crop — maize, for its various uses including domestic consumption, hence the Government's decision to make sure it is included in all packages.

The decision is meant to climate-proof your operations so that when one crop fails, you can count on the chance for another to pull through.

It is crucial for you to be honest with yourselves and make sure you put the inputs to good use so that the results recorded at the end of the season will give a true reflection of what should happen in a season that would have been forecast to have normal to above normal rains.

Let's talk a bit about how you can handle your financial matters this season.

This is where you need to tread carefully when you do your planning lest you fail to produce productively despite receiving governmental support. You also need to grow your own free crops using your own funds so that you broaden your income base.

You must be ready to seek advice from people with the capacity to handle and deploy finances productively and make your decisions based on accurate financial data.

Your successful season starts with the right choices of activities and advisors. You must choose the right ones and try as much as possible to aggressively manage your expenses throughout the season.

Set clear budget objectives to serve as beacons that will inform the direction your forward march will take.

Wish you successful preparations for the new season!

Obert Chifamba

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Development of Pfumbvudza/Intwasa was motivated by the need to climate proof crop production against adverse impacts of climate change

Pfumvudza principles key to climate change adaptation

Blessing Mudaniso

Training and Information Services Climate change is one of the greatest challenges facing the world's environment, society and economy today in crop production with negative repercussions, which include worsening droughts and crop failures.

Realising that the impacts of climate variability and climate change must be addressed in all crop development activities, Zimbabwe has included climate proofing strategies.

The development of the present farming concept was motivated by the need to climate proof crop production against adverse impacts of climate change through the introduction of sustainable and economical viable adaptation opportunities.

This concept is called Pfumvudza. This concept, which is designed to meet cereal needs for an average household of six members over one year, applies conservation agriculture (CA) principles and provides families with a fresh new start, hence the name Pfumvudza.

All the CA principles are applied "on time, at standard, without wastage," on a plot measuring 39m x 16m. Pfumvudza/Intwasa is a concept that is aimed at climate proofing agriculture by adopting conservation farming techniques and involves the utilisation of small pieces of land and applying the correct agronomic practices for higher returns (yield).

The approach can be used in marginal areas and still give high yields. The impact of climate change in agricultural systems is undoubtable. In addition to the good rainfall in the 2020/21 season, the practice of climate proofed technologies (Pfumvudza/ Intwasa) significantly contributed to increased yields.

To counter climate change, farmers have to adopt new farming systems to attain a cost effective and sustainable crop production.

Pfumvudza as one of the climate proofing concept, it is based on a combination of three main principles: (1) minimum soil disturbance, (2) permanent soil cover through crop residues or cover crops, and (3) crop species diversification for achieving high productivity. Pfumvudza is an approach to farming that is based on key principles of conservation farming.

To achieve high yields, all processes must be done on intended period, to a high standard, without depleting resources. Using the Pfumvudza input pack it is possible to feed a family for a year from a minimum investment.

The objective of the Government together with the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development is to climate proof the agricultural production of smallholder farmers (80 percent of farmers in Zimbabwe) and ensure food self-sufficiency for the nation. The benefit of Pfumvudza farming system is that it is much easier to maintain a smaller plot at high standards than a bigger one. Hence, if small-scale farmers can focus their efforts on small plots they would benefit from better management and increase chances of better yields.

In times of drought, because the plots are small and manageable, farmers can water their plots and reduce the effects of moisture stress. Cultivating small plots will also reduce the amount of mulch required. Pfumvudza has been endorsed as a way to reduce soil erosion and soil fertility degradation.

The expertise of Pfumvudza provide opportunities to reduce the cost of production, save water and nutrients, increase yields, improve efficient use of resources, and benefit the environment. It enhances biodiversity and natural biological processes above and below the ground surface, which contribute to increased water and nutrient use efficiency and to improved and sustained crop production.

Pfumvudza has since reduced the chances of failure through the improvement of crop production thereby increasing yields and ensuring food security. A stark reality in smallholder farming communities reliant on climate-sensitive rain fed agriculture has been detected and a need for climate-proofing essential crop varieties has risen.

In the 2022/23 cropping season the deployment of high yielding varieties according to agro-ecological zones will be introduced as different crops adapt differently to different climatic conditions. These crops include maize, sorghum, soya bean, pearl millet, sunflower, groundnuts, African peas and vegetables. Each agro-ecological zone has to grow crops, which are region specific in terms of rainfall, temperature and soil type.

This is important to safeguard food and nutrition against climate change and to improve smallholder farmers' resilience to climate variability. Smallholder farming systems have been recognised as highly vulnerable to climate change because they are highly dependent on agriculture and livestock for their livelihoods.

In Zimbabwe, some farmers are vulnerable due to their marginal location, low levels of technology and lack of other essential farming resources. Farmers observe high frequency and severe drought, excessive precipitation, drying of rivers, dams and wells and changes in timing and pattern of seasons as evidence of climate change, and indicated that prolonged wet, hot, and dry weather conditions resulting in crop damage, death of livestock, soil erosion, bush fires, poor plant germination, pests, lower incomes, and deterioration of infrastructure.

Farmers must, therefore, adapt cropping practices that help mitigate against the vagaries of climate change and variability, as well as conserve soil and water. Thus, the promotion of climate-proofed Pfumvudza programme is a noble idea on the part of the Zimbabwean Government.

However, there is a need to ensure that, coupled with the enhanced production as a result of good management practices under Pfumvudza, the varietal choices are correct. This ensures nutritional security at the household level.

● ***Blessing Mudaniso is the acting deputy director Training and Information Services- Lands, Agriculture, Fisheries, Water and Rural Development Ministry***

New format for seasonal forecast

2022/2023 Rainfall Season Outlook

The Meteorological Services Department issued the 2022/2023 seasonal rainfall forecast on 31 August 2022.

The seasonal outlook is an important planning tool for the different sectors which depend on rainfall.

The current seasonal outlook, unlike in previous seasons, was issued for four sub-seasons namely October-November-December (OND), November-December-January (NDJ), December-January-February (DJF) and January-February-March (JFM) to show the transitions across the months.

Unlike in the past, where the seasonal forecast was given for two sub-seasons, OND and JFM, this new format shows the transition between sub-seasons to the sub-seasonal rainfall total.

October-November-December Sub-season

The forecast for the first sub-season October to December is indicating the likelihood of normal to below normal rainfall for the areas in the northern half of the country (Figure 1(b)).

These areas will receive accumulated rainfall, which is in the normal range or less. In other words by the end of the three month period, these areas are likely to have received their "usual rains" or less.

The term "usual rains" has been taken to mean the rainfall amounts that the area would receive in most years. It should also be noted that the first two sub-seasons are the periods where meteorological hazards which have a notable effect on tobacco farming, such as hailstorms, are common.

November-December-January sub-season

During the three-month period NDJ, there should be an improvement in the accumulated rainfall with the country expected to receive normal to above-normal rainfall (Figure 2(a)).

This means that there is a higher likelihood for these areas to receive their "usual rains" for that time of the year or even more.

It should also be noted that the first two sub-seasons are the periods where meteorological hazards which have a notable effect on tobacco farming, such as hailstorms, are common.

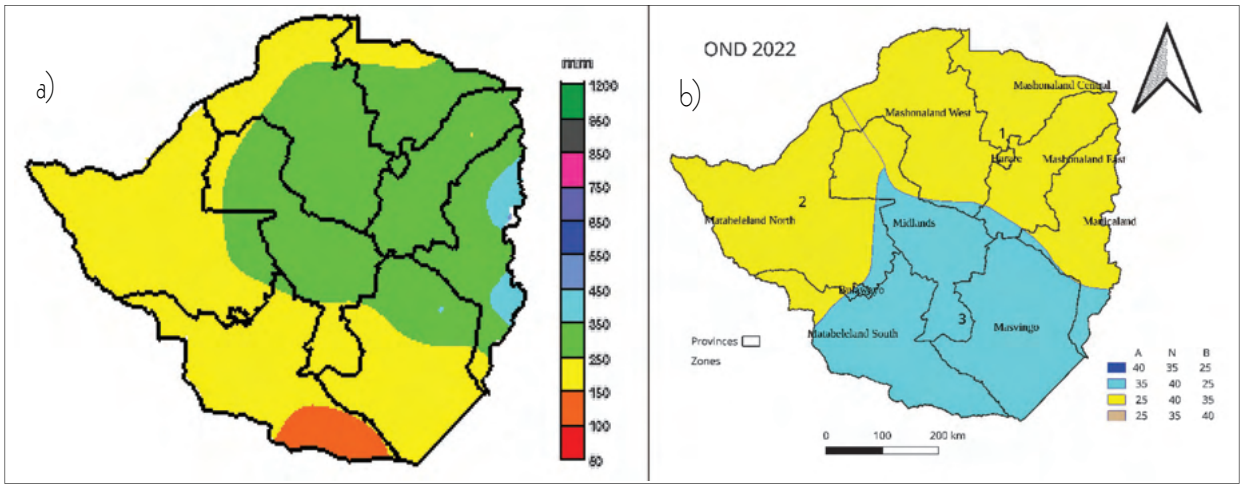


Figure 1(a) Long-term mean rainfall for October-November-December (1981-2010), (b) Seasonal outlook for October-November-December 2022

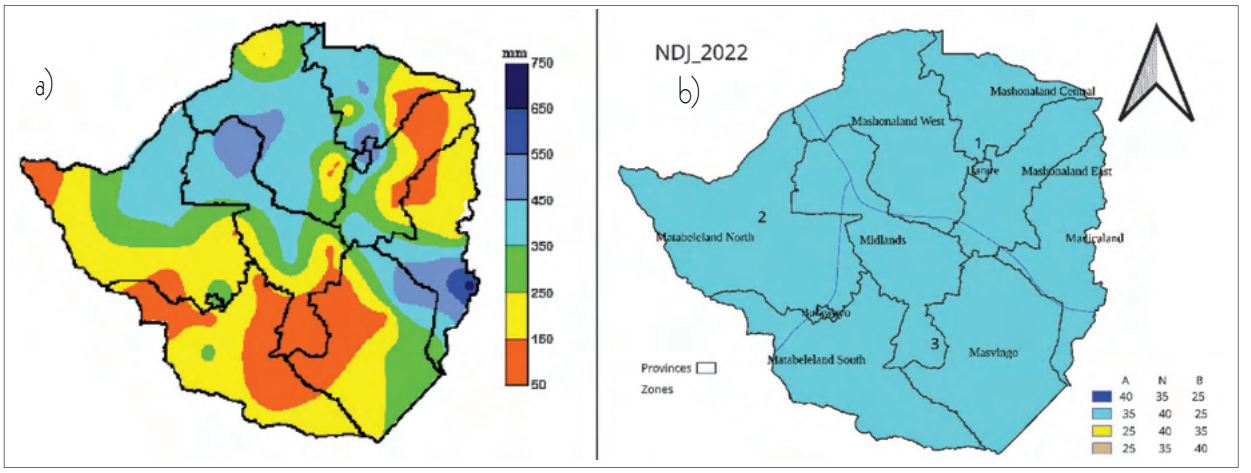


Figure 2(a) Long-term mean rainfall for November-December-January (1981-2010), (b) Seasonal outlook for November-December-January 2022/23.

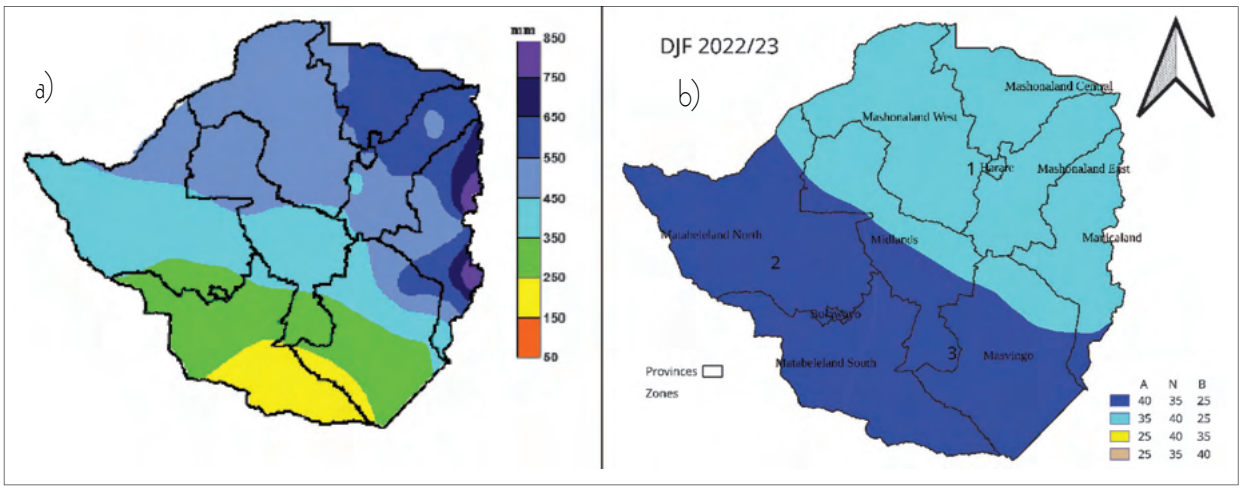


Figure 3(a) Long term mean rainfall for December-January-February (1981-2010), (b) Seasonal outlook for December-January-February 2022/23.

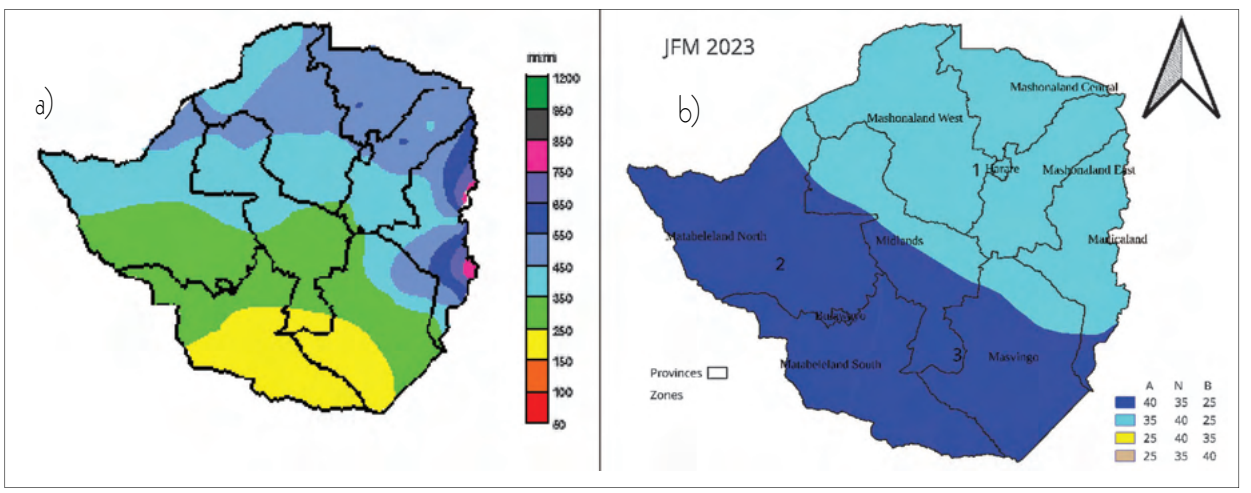


Figure 4(a) Long term mean rainfall for January-February-March (1981-2010), (b) Seasonal outlook for January-February-March 2023.

December-January-February sub-season

During the DJF period, the western and southern areas are expected to receive above-normal rainfall (Figure 3(a)). This means that there is a high likelihood that these areas will be receiving more than their "usual rains" for that time of the year or even more.

January-February-March (JFM) 2023 period

The JFM period is also expected to receive normal to above-normal rainfall (Figure 4(a)). This means that there is a high likelihood that these areas will be receiving their "usual rains" for that time of the year or even more.

The Meteorological Services Department will continue to monitor all the available seasonal climate indicators which influence Zimbabwe's rainfall as they evolve.

The seasonal forecast focuses on the accumulated rainfall amount for a sub-season or three-month period such as OND or NDJ in comparison to the long-term average of an area for that specific period.

The seasonal forecast is to be used in conjunction with the 3-day and 10-day forecasts including the user's knowledge of the rainfall patterns within their area.

Given the current forecast, there is need to improve stocks of seed and fertilisers. There is a higher risk of leaching during the season.

Farmers are encouraged to practice soil conservation techniques such as construction contours and storm drains.

High rainfall may result in an increase in livestock diseases therefore farmers should stock up on dipping chemicals and ensure consistent dipping.

Soil pH: Need for lime to correct acidity

Emmanuel Chikwari

CABINET recently approved the Agriculture Recovery Plan whose main objective is to stem the continued reduction in production and productivity of maize, wheat and soya bean.

One of the solid interventions required to reverse the negative production trends, attain self-sufficiency and allow the country to move away from the perpetual importation of these strategic commodities is conditioning the soil in order to improve its productivity. Soil acidity is the biggest challenge in most smallholder farms.

It has become clear that without liming acidic soils, the chances of optimising soil productivity are very slim.

Government, through the Ministry of Lands, Agriculture, Water and Rural Development rolled out the Blitz Soil Conditioning Programme to ameliorate soil acidity and improve agricultural productivity.

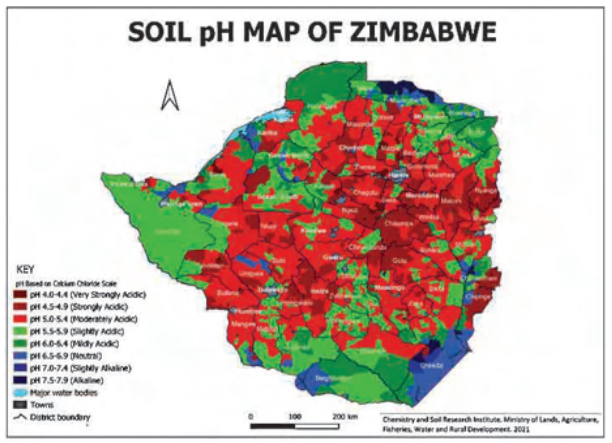
This programme therefore seeks to reinforce liming of acidic soils as has been identified as one of the strategies in National Development Strategies 1 (NDS1) to ensure food security.

The programme entailed pH analysis of at least 100 soil samples for every communal ward, giving lime recommendations, and developing national and provincial maps.

Through this rigorous exercise, soil pH results and lime recommendations were given to farmers through Agritex and soil pH maps were used to advise policy on lime distribution and utilisation in the country.

What is soil pH?

- Soil pH is a measure of acidity or alkalinity of a soil.
- It is measured on a scale from 1-14.
- An acidic soil is one whose pH (measured in water) is below 7.0 units while an alkaline soil has a pH above 7.
- When pH is determined in 0.01 moles per litre of calcium chloride (0.01M $CaCl_2$), the neutral pH value is lower than 7.
- For crop production, yields are adversely affected when pH is below 5.0 units on a $CaCl_2$ scale.
- Soil acidity affects nutrient availability and plant growth.
- Incorporation of lime into the soil sweetens it by correcting soil acidity.
- Correct soil pH increases fertiliser use efficiency and ultimately improves soil productivity.
- Liming a soil beyond optimum pH ranges negatively affects soil productivity.

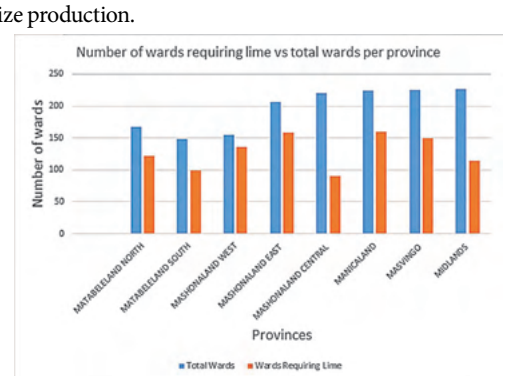


SOIL PH VARIATIONS IN ZIMBABWE

More than 70 percent of Zimbabwean soils are acidic and require liming to correct pH for optimum crop productivity. Soil pH variations are largely mediated by amount of rainfall. Those areas that receive more rainfall are largely acidic whereas the drier parts of the country are alkaline.

Remarks

- For maize production, no lime is required in the green and blue areas and the minimum pH to be achieved through liming is 5.5.
- For legume crop production, slightly acidic soils should be limed to achieve a minimum pH of 6.0.
- Lime should be utilised in the brown, dark red and red areas for maize production.



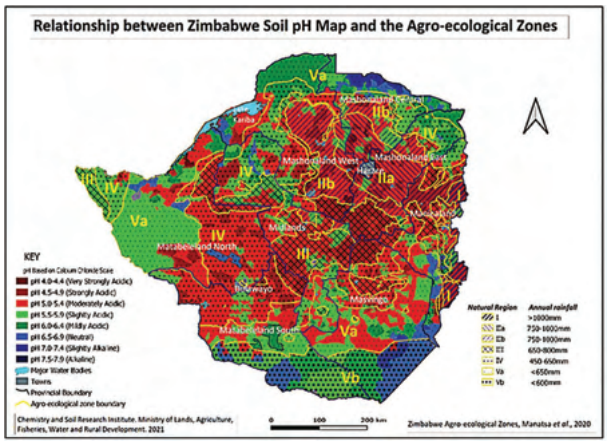
About 65 percent of all the wards in the country have acidic soils that require lime for optimum maize productivity.

The pH benchmark (on a calcium chloride scale) for soil conditioning through lime is 5.5 for maize production.

This benchmark has been used throughout this report. The 65 percent therefore excludes slightly acidic (5.5-5.9) and mildly acidic (6.0-6.4) soils.

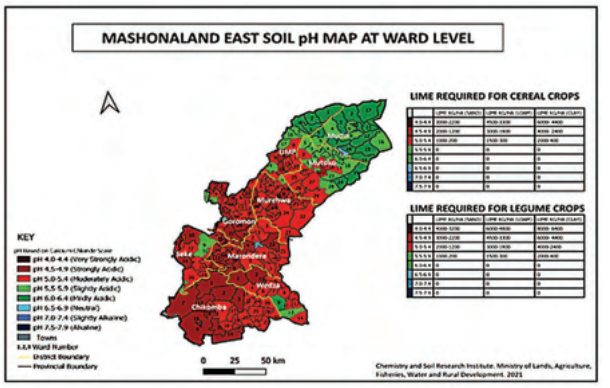
If benchmarking is based on legume crop production, more than 70 percent of the wards would require lime. These two crop types (maize and legumes) are important in soil acidity amelioration.

The order of acidity (proportion of wards with acidic soils requiring lime) follows the trend: Mashonaland West (88 percent), Mashonaland East (76 percent), Matabeleland North (73 percent), Manicaland (71 percent), Masvingo (67 percent), Matabeleland South (67 percent), Midlands (50 percent), Mashonaland Central (41 percent).



As the trend for soil pH dependence on rainfall is evident, the revised agro-ecological map can be further improved by considering soil pH as it is an important parameter that is strongly influenced by rainfall.

Soil pH variations across provinces

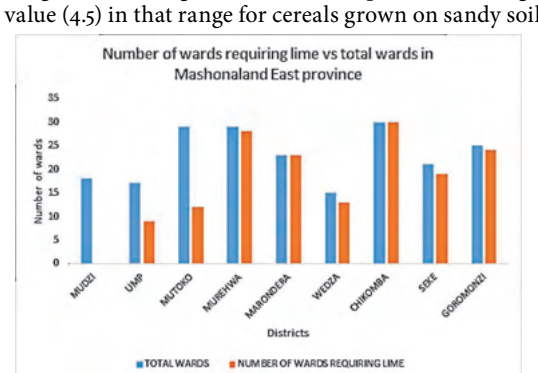


1. Mashonaland East

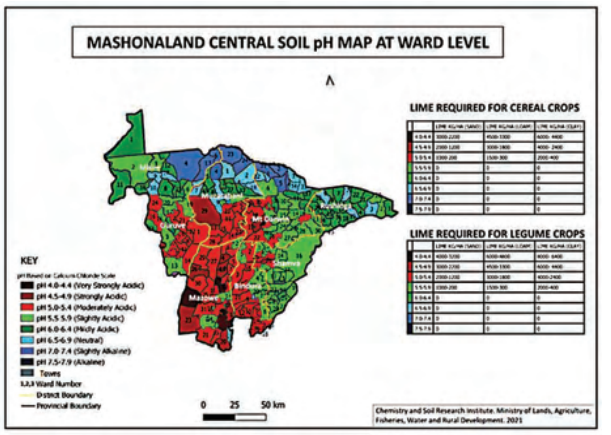
- Soil acidity is a common problem in districts that receive high rainfall (Chikomba, Seke, Wedza, Marondera, Goromonzi and Murehwa). Soil acidity correction through liming should be highly promoted.
- Higher soil pH values in more arid districts such as Mudzi and some arid parts of Mutoko district. Problem of lower crop yields could be attributed to low rainfall and not soil acidity in these districts. If rainfall is supplemented by irrigation, such soils would sustain productivity (if adequately fertilised).

Remarks

- As a guide to the lime requirements: pH range of 4.0 – 4.4: 3000kg/ha of lime corresponds to the lowest pH value (4.0) in the range and 2200 kg/ha of lime corresponds to the highest pH value (4.5) in that range for cereals grown on sandy soils.

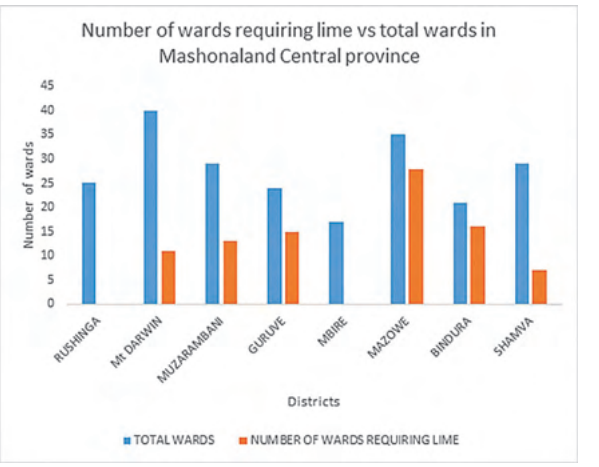


The graphs show the need for lime in those districts which receive high rainfall such as Goromonzi (96 percent of the wards), Seke (90 percent), Chikomba (100 percent), Wedza (87 percent), Marondera (100 percent) and Murehwa (96 percent). Only a few districts in Mutoko (41 percent) need lime compared to those which do not require lime while UMP has 53 percent of the wards that require lime. No lime is required in Mudzi district in all the wards. For the whole province, 76 percent of the wards require lime.



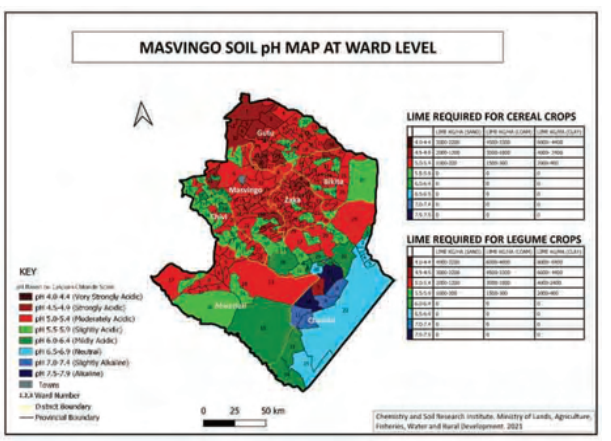
2. Mashonaland Central

- Soil acidity is evident in high rainfall districts (Mazowe, Bindura, Guruve and some parts of Muzaraabani, and Mt Darwin). Soil acidity correction through liming should be highly promoted. Having conditioned the soils with lime and balanced soil nutrition through fertilization, these areas will sustain high crop production.
- More arid districts such as Mbire and Rushinga and some arid parts of Muzarabani, Mt Darwin and Shamva districts have higher pH values. Low crop productivity is more attributable to low rainfall and not pH. With supplementary irrigation and goof fertiliser regimes, these areas can sustain high crop production.



Lime is required in those wards which receive high rainfall. Highest requirements are in Mazowe district (80 percent of the wards) and the trend goes down to the driest districts; Bindura (76 percent), Guruve (63 percent), Muzarabani (45 percent), Shamva (41 percent), Mount Darwin (28 percent), Rushinga (0 percent), and Mbire (0 percent). Overall, the province has 41 percent of the wards in need of lime.

3. Masvingo



● Continued on Page 10

Indigenous chickens: road to nutrition security, income generation

John Taderera

FOLLOWING the successful launch of President Mnangagwa's Rural Poultry Scheme in Masvingo, this article will seek to explore the benefits of rearing indigenous chickens and the scheme's implementation modalities.

Indigenous chickens are the most abundant livestock in many rural and peri-urban households in Zimbabwe.

These chickens are also referred to as rural, village, backyard, scavenging, traditional or family chickens, and have various names in local languages.

They play an important role in household economies in that they convert feed resources available in the homestead to highly nutritious and valuable protein products.

Although their output in terms of weight gain and number of eggs per hen per year is low, it is obtained with minimal inputs and with low risk.

This makes it one of the major advantages of extensive indigenous chicken production systems. Significant returns can be achieved from indigenous chicken without the need for expensive housing, complex technology and funding just by utilising locally available resources.

Animal protein consumed in rural areas frequently comes from indigenous chicken meat and eggs. Chicken can also be sold or bartered to meet family needs such as medicines, clothes and school fees.

In this way, they act as a ready source of cash for emergencies and small purchases. These birds are also important during special festivals, traditional ceremonies and treatments.

Chicken meat and eggs provide a readily available, high-quality source of proteins, vitamins and micronutrients. Eggs are an excellent source of iron, zinc and vitamin A, all of which are essential to health, growth and wellbeing.

Chicken and eggs contribute to a nutritious and balanced diet, which is especially important for children, nursing mothers and many vulnerable groups.

Nearly all rural and peri-urban households keep small flocks of indigenous chicken, mostly owned and managed by women and children.

Simple changes in management of indigenous chickens can significantly improve production and the living conditions of many rural families in terms of enhanced nutrition and income generation through the sale of surplus chickens or eggs.

Improved indigenous chicken production is therefore a low-cost and important aspect of enhancing food and nutritional security.

As Government continues to implement programmes to empower its citizens, the President subsequently launched the Presidential Rural Poultry Scheme in an effort to make sure that the country achieves an upper middle-income status by 2030.

> The Presidential Rural Poultry Scheme is one of the many building blocks under the agriculture sector meant for the achievement of self-sufficiency.

The Presidential Rural Poultry Scheme is one of the many building blocks under the agriculture sector meant for the achievement of food and nutrition security and ultimately self-sufficiency.

Government seeks to develop and commercialise indigenous chicken production to benefit farmers and the general populace in terms of nutrition security, incomes and general livelihood improvement.

The programme targets to distribute 30 million indigenous chicken chicks at one month of age to three million households countrywide.

The input package also includes a vitamin stress mix and the agriculture and rural development advisory services directorate will be responsible for farmer training on good indigenous chicken husbandry practices as well as technical backup to all the beneficiaries of the programme.

The scheme will be implemented over a period of two years with equitable distribution of the chicks in all the 10 provinces of the country.

Targeting of the beneficiaries will start with vulnerable households in the community and selection will be done by ward selection committees made up of community leadership.

The vulnerable households will include but not limited to orphans, elderly, and people living with disabilities, widows, widowers and so on.

Government has already made an investment at the scheme launch site, Sipambi Business centre in Ward 11 of Masvingo District, in the form the of poultry houses, a hatchery, a borehole and reservoirs for the purposes of expanding rural poultry production.

The place will act as a Youth Centre of Excellency responsible for developing youths into agri-preneurship and the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development will be responsible for running the institution.

The activities at the centre will include indigenous chicken breeding, with at least 1 500 indigenous chicken hens, as well as a hatching indigenous poultry eggs.

Communities around the hatchery will also benefit through hatching their poultry eggs for increased indigenous poultry production at household level.

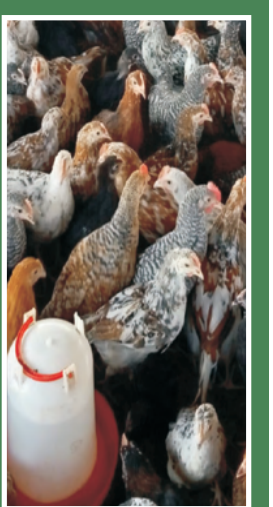
It is envisaged that the project will become a major producer and supplier of indigenous chickens in Masvingo province and beyond.

● ***Taderera is a Livestock Specialist with the Department of Livestock Production and Development (DLPD) — ARDAS***

THE ZIMBABWE FREE RANGE POULTRY ASSOCIATION (ZFRPA)

1. ZFRPA is engaged in training road runner farmers to take farming as a business. Trainings include:
   - use of ethno-veterinary medicine to reduce on production cost and maximise utilisation of available cheap source of medicine.
   - feed formulation so as to utilise locally available feed ingredients that maximises production at a minimal cost.
   - poultry husbandry which equips farmers with production skills set that reduces mortality and increases farmer's production stock.
   - Ultimately this improves farmer's livelihoods and disposable income hence promoting economic activities
2. ZFRPA is promoting environmentally friendly climate smart poultry farming through use of climate smart technologies and promotion of circular economy.
   - Utilisation of organic manure is reducing demand for artificial fertilizer hence reducing foreign currency leakages through use of organic manure.
3. ZFRPA is promoting market systems development through sound market linkages between both small scale and commercial farmers and the end market.
   - With it's participation in the current Presidential poultry program, it is eyeing export market so as to increase foreign currency earnings. So the contribution of ZFRPA to the Zimbabwean economy through increase of the GDP can not be over emphasized
4. ZFRPA is promoting commercialisation of road runner business with the aim of making Zimbabwe the hub of road runner production in the next decade
   - ZFRPA is selling quality road runner breeds (day olds) to all farmer's in Zimbabwe hence improving production and productivity.
   - It is also providing a ready market for the fertilised eggs. This is in addition to offering incubation services.
   - Zfrpa has actively engaged poultry value chain actors. Transporters, charcoal suppliers, hatcheries, and the private sector at large have their livelihoods improved through their participation on different nodes of the value chain.
   - Their participation is expected to improve as the project grows.

ZFRPA is currently playing a significant role as the poultry stakeholders hub. This is critical for creation of an enabling environment and favourable polices for efficient proliferation of free range poultry products on the market



ZFRPA National Office, Harare Exhibition Park, Cnr 4th Avenue and 3rd Street, Opposite NSSA Stand, Samora Machel West, Harare Tel: +263 242 790086, Mobile +263 779 600730 / +263 784 335019 / +263 775 O53769 / +263 772 568895
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SUSTAINABILITY | CLIMATE SMART | COMMERCIAL | HEALTHY EATING LIFESTYLE

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SMALLHOLDER IRRIGATION REVITALISATION PROGRAMME

CLIMATE PROOFING SMALLHOLDER AGRICULTURE

Brief background

The Smallholder Irrigation Revitalisation Programme is co-financed by the Government of Zimbabwe, the International Fund for Agricultural Development (IFAD) and the OPEC Fund for International Development (OFID). The programme has a budget of US$52 million with IFAD financing 50% (US$25.5 million) of overall programme costs on grant terms, while the Government is financing taxes and duties (US$7.7 million), representing 15% of total costs. Beneficiaries contribute US$3.28 million which is 6% of total programme costs in the form of financial contributions to operations and maintenance for rehabilitated infrastructure, cost sharing during construction and in-kind contribution to soil and water conservation activities. OPEC Fund is financing 29% (US$15.0 million) of programme costs covering civil works related to irrigation rehabilitation and road improvement. SIRP is being implemented over a period of seven years from 2016 to 2023.

SIRP's main objective is to reduce vulnerability of smallholder farmers to food and nutrition insecurity, climate change effects and economic shocks. This is being achieved through sustainably increasing rural household incomes in SIRP supported schemes and adjacent rainfed areas as well as rehabilitating and in some cases expanding targeted irrigation schemes. The programme also supports farmers in irrigation schemes and those in surrounding rainfed areas to increase productivity, production and income, as well as improving access to agricultural markets and financial services. SIRP is rehabilitating 73 irrigation schemes in Matabeleland South, Midlands, Masvingo and Manicaland.

Beneficiaries

The programme aims to reach out to 27 500 households who include;
8500 irrigators
19000 farmers in greater scheme areas
500 extension officers in both Component 1 (Irrigation and rehabilitation) and Component 2 (agricultural extension officers) who are being capacitated in various areas.

Component 1 - Irrigation rehabilitation

This component aims to revitalise 6100 hectares of irrigable land targeting smallholder irrigation schemes in Masvingo, Manicaland, Midlands and Matabeleland South. A total of 73 irrigation schemes are being targeted with SIRP having completed rehabilitation of 23 schemes covering 2286 hectares out of 6100 hectares.

Completed projects 2021

Irrigation scheme	District	Province	Hectarage
Musikavanhu	Chipinge	Manicaland	570
Rupangwana	Chiredzi	Masvingo	60
Gudo	Chiredzi	Masvingo	50
Banga	Chivi	Masvingo	65
Mayorca	Kwekwe	Midlands	76
Exchange	Kwekwe	Midlands	168
Chikwalakwala	Beitbridge	Matabeleland South	65
Guyu	Gwanda	Matabeleland South	85
Sebasa	Gwanda	Matabeleland South	65
Tshovani	Chiredzi	Masvingo	360
Fuve Panganai B	Zaka	Masvingo	88
Old Biri	Mberengwa	Midlands	36
Biri Extension	Mberengwa	Midlands	117
Insukamini	Gweru	Midlands	41
Silalabuhwa	Insiza	Mat South	440
TOTAL			**2286**

IMPACT SO FAR

Increased production, productivity

Rehabilitation of irrigation infrastructure that had collapsed as well as scheme expansion such as in Rupangwana (Masvingo) and Guyu (Matabeleland South) has seen farmers being able to grow more crops on expanded scheme fields.

There has been increased productivity due to improved water availability and water-use efficiency for example, in Banga where a new pumping system was installed which conserves water and reduces the time that farmers spent watering the field as well as solar conversion from diesel in Sebasa and Chikwarakwara. Replacement of the water conveyancing system at Banga has helped farmers to conserve water unlike the old system where they would run out of water due to leaks and high water demand.

Below - Wheat at Banga, Chivi District of Masvingo

Below Wheat at Chikwalakwala Irrigation Scheme in Beitbridge, Matabeleland South

Climate proofing our agriculture- moving from rain dependency to irrigation.

In an effort to ensure that farmers are cushioned against shortage of water during droughts and during the dry winter months, the programme rehabilitated water sources in some schemes and replaced water conveyancing and in field watering systems in others to create efficiency in the usage of water. The scope of works in the various schemes included repair of pumping systems, canals as well as replacement of in-field watering systems such as in Banga and Guyu.

At Banga, open canals were removed and replaced with a piped surface irrigation system that saves water. This has enabled farmers to conserve water unlike the old system where they would run out of water due to leaks, ensuring that they are able cultivate crops all year round. Farmers are also able to irrigate the field in less time than the old system.

In Midlands, SIRP rehabilitated Exchange and Mayorca irrigation schemes with the scope of works at Mayorca including the repair of the dam wall availing water for the 76 farmers who are now able to cultivate crops all year round in the 76-hectare scheme.

Below- Pontoon installed at Mayorca, as part of the rehabilitation works

Rehabilitation has also been done at Sebasa in Gwanda where well points were drilled on the Thuli River and fitted with submersible pumps while the pumping system was converted from diesel to solar. These interventions have allowed farmers to access water for irrigation all year round in the drought prone province. At Guyu in Mat South, the scheme was expanded from 32 hectares to 84 hectares. This has availed more land for irrigation while also allowing farmers to venture into dairy farming at the scheme. To build resilience against climate change effects such as shortage of fodder during the dry months, farmers are able to grow fodder for their dairy cattle and even supply other farmers in the greater scheme area who are heavily dependent on cattle ranching in the drought prone province.

Below The solar panels installed by SIRP, used to pump water from the Thuli River in Gwanda.

At Rupangwana in Chiredzi, the scheme was expanded from 12.5 hectares to 50.5 hectares, availing more irrigable land for cultivation of crops for consumption and sale.

Sustainability

To ensure sustainability in the maintenance of schemes SIRP has trained farmers on Operations and Maintenance for sustainable management of irrigation equipment after SIRP completes rehabilitation. Farmers make a contribution of US$100 per hectare, per farmer per annum towards an O and M fund for scheme. Irrigation Management Committees have been trained on scheme governance and leadership, which now contributes to viable production and increased income by the farmers.

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COMPONENT 2- CLIMATE SMART AGRICULTURE INTERVENTIONS AND IMPACT

Block Irrigation
This has been introduced across all schemes complimented by the cultivation of high value crops. This has seen farmers at Musikavanhu and Hamamavhaire venturing into chilli production while those in Banga are growing groundnuts and sugar beans. Sugar beans is also being cultivated at Fungai, Gudo and Sebasa.

Above bean crop at Fungai Irrigation Scheme, Chiredzi

National food security
Most of the schemes rehabilitated by SIRP such as Banga, Musaverema (Masvingo) Mayorca, Insukamini (Midlands) Chikwalakwala and Sebasa (Mat South) have planted wheat in the 2022 winter season and are contributing to national food security.

Wheat hectarage

MIDLANDS	141.1
MASVINGO	280.6
MANICALAND	336
MAT SOUTH	250
TOTAL	**1007.7**

Marketing and value chain development
As part of the establishment of market links for high value crops, SIRP is constructing a post harvest and cooling system at Insukamini Irrigation Scheme in Midlands which will benefit farmers from Insukamini, Mkoba, Mambanjeni and London Farm. Farmers will be able to store perishable horticultural products such as peas and other vegetables before delivery to the market.

Gender Mainstreaming
Under SIRP, 52% of beneficiaries are women. While they form the largest proportion of the population, they have been marginalised. The programme is working to change attitudes towards women participation in leadership positions in agriculture by encouraging women to take up leadership roles, changing social attitudes towards gender based violence and the promotion of inclusivity of marginalized groups such as Persons with Disabilities, single and widowed women in irrigation and greater scheme areas. SIRP has rolled out training on mutual decision making on agricultural activities, profit sharing and on resolution of conflict in the communities and families. Impact is already being felt in the communities trained in this area as there are now a number of female led schemes while more women now form part of IMCs. Gender Action Learning systems (GALS) approach has been introduced by SIRP and impact is already being noted, for example in Gwanda, where one of the groups trained in Samelodi is now offering anti-GBV counselling in communities and in schools. Some of the farmers have reported that they have reconciled in their marriages after the GALS training while a lot more men are now participating in roles previously allotted to women as labour sharing is taking place. In addition, such households are beginning to realise increased production and productivity in their farming operations.

Environmental Management
In order to ensure soil and environmental conservation in schemes and in the adjacent rain fed areas, SIRP has conducted training in conservation works and implementation of the same in all schemes. Farmers have constructed gabions in Gudo and Sebasa to protect irrigation schemes from flooding while also planting vertiva and banner grass in the same areas.

Building resilience
In its effort to build resilience among farmers in light of climate change, SIRP aims to ensure that farmers are able to survive even during drought years. In order to supports our high impact projects such as goat projects under the Rural Poor Stimulus Facility (RPSF) and to satisfy their own nutritional needs, farmers in SIRP supported schemes are planting fruit trees for nutrition and for sale. SIRP has supported the establishment of a fruit orchard in Sebasa (Gwanda) and planting of indigenous trees that provide fodder for livestock. SIRP distributed 40 000 seed balls which included 35 000 guava and 5000 acacia were to Midlands (Mayorca, Exchange, Lower Gweru, Hamamavhaire and Mundi Mataga schemes)

For farmers in the greater scheme or adjacent rain fed areas there is provision of small stock such as goats and chickens under the Rural Poor SF and High impact programmes. In the event of drought, farmers can fall back on these for survival though sale and purchase of various required items. Under the Rural Poor Stimulus Facility, 4175 commercial chicken layers were distributed to 835 households while 61 153 indigenous point of lay pullets were distributed to 6394 households. This was augmented by 2.33 tonnes of layer mesh, vet drugs and disinfectants delivered to the same households.

Under Natural Resources high impact projects, 4200 point of lay indigenous chickens were distributed to 20 farmer groups in Musikavanhu, Manicaland. These groups will pass on the chickens to other farmers.

SIRP also distributed 19 cattle to the Muteyo high impact project, Chiredzi and these have grown to 41 cattle.

Nutrition Training
The Smallholder Irrigation Revitalisation Programme is also providing training in nutrition education in schools and communities adjacent to SIRP supported schemes. Government launched the bio-fortification policy in 2019 to protect consumers against lack of nutrients such as iron, Vitamin A, zinc. Rural farmers often grow their own food and as a result, do not benefit from the industry fortified foods sold in supermarkets. SIRP is promoting the cultivation of bio-fortified varieties such as the Orange maize, Orange sweet potatoes which are rich in Vitamin A. The programme is also promoting cultivation and consumption of the iron rich NUA 45 sugar beans to address these deficiencies. Farmers are already multiplying sweet potato vines in various parts of Mat South while several schemes have grown NUA45 sugar beans.

TESTIMONIALS FROM THE IRRIGATION SCHEMES

Before the SIRP intervention, our water would be from the dam, released into the stream using old canals that leaked resulting in heavy water losses. This, in turn resulted in Banga Dam drying up early because we used to draw a lot of water from the dam. We used to stop cultivation of crops in the scheme during some months of the year as we waited for the commencement of the rainy season.

It is a different story now. SIRP provided us with new pipes and water is now conveyed straight to the scheme with no losses. The new intervention is saving us precious water and we expect to irrigate in our scheme throughout the whole year- Matiza Munogwei, Chairperson, Banga Irrigation Scheme, Masvingo

Before SIRP came, only block A was under cultivation, the water was powered from Mashaba using submersible pumps and the water was not enough. Farmers had to buy a diesel powered engine to supplement the water. There were only 43 farmers. When SIRP came, they installed eight submersible solar pumps, 176 solar panels, three inverters and 28 batteries. They also rehabilitated the canals in block A, B and C and gave us NUA45 bean seeds. They also gave us tree seedlings and we now have an orchard within the scheme. Now farmers are happy, they no longer complain of hunger. There is food security, there are also part-time jobs during planting, weeding and harvesting. Our farmers now have hope, hope for the future. Before SIRP came, as farmers were not so hopeful, we used to depend on our sons and daughters in South Africa for food. Now we can fend for ourselves, life is much better- Albert Sibanda Secretary, Sebasa Irrigation Scheme

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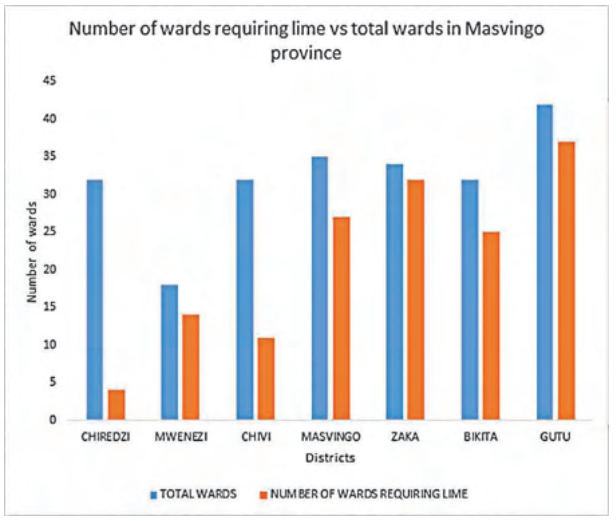
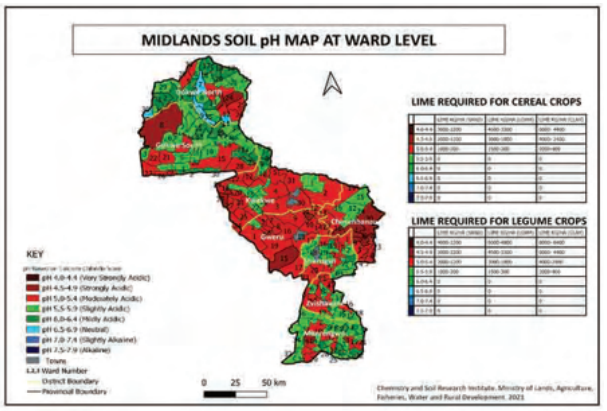
• Northern districts (Gutu, Masvingo, Bikita & Zaka) are worst affected by soil acidity. Gutu district is on the extreme with several wards having strongly acidic soils (pH 4.5 - 4.9).
• More arid districts (Chiredzi, Mwenezi and Chivi) have higher pH values.

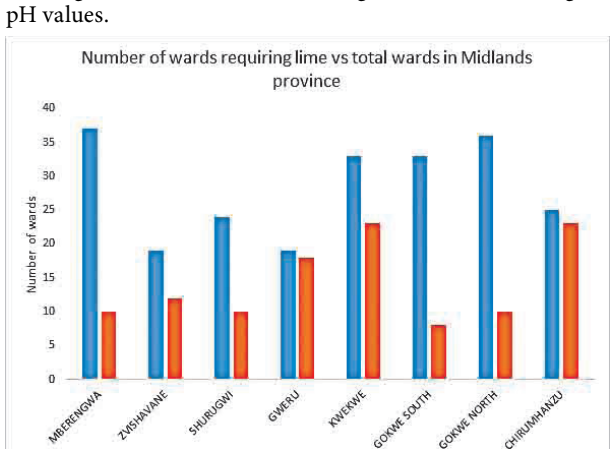


Districts which receive highest rainfall have most of the wards that require lime whereas the driest districts such as Chiredzi and Chivi have fewest number of wards that require lime. The trend of percentage of wards requiring lime is as follows: Zaka (94 percent), Gutu (88 percent), Bikita (78 percent), Mwenezi (78 percent), Masvingo (77 percent), Chivi (34 percent) and Chiredzi (13 percent). For the whole province, 67 percent of the wards require lime.



4. Midlands

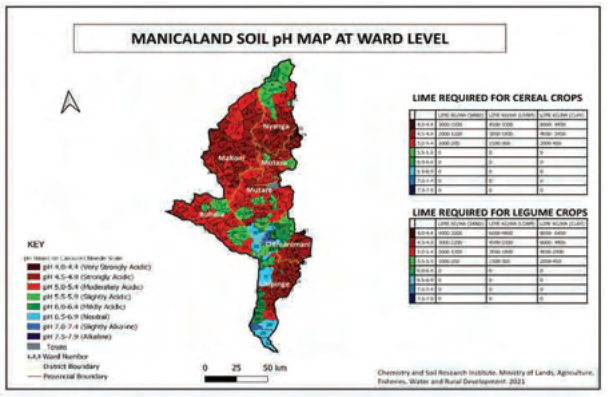
• Soils in central districts (Gweru, Kwekwe, Chirumanzu) are mainly acidic.
• The northern (Gokwe North, Gokwe South) and southern (Shurugwi, Zvishavane and Mberengwa) districts have higher pH values.



Gweru and Chirumanzu districts have the highest number of wards that require lime.

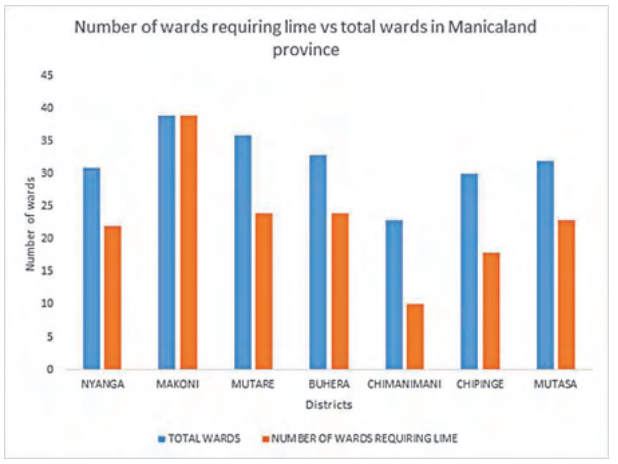
The drier districts such as Mberengwa, Shurugwi, Gokwe North and Gokwe South have fewest number of wards that require lime.

The trend is as follows: Gweru (95 percent), Chirumanzu (92 [percent), Kwekwe (70 percent), Zvishavane (63 percnt), Shurugwi (42 percent), Gokwe North (28 percent), Mberengwa (27 percent), and Gokwe South (24 percent). Overall, 50 percent of wards in the province require lime.

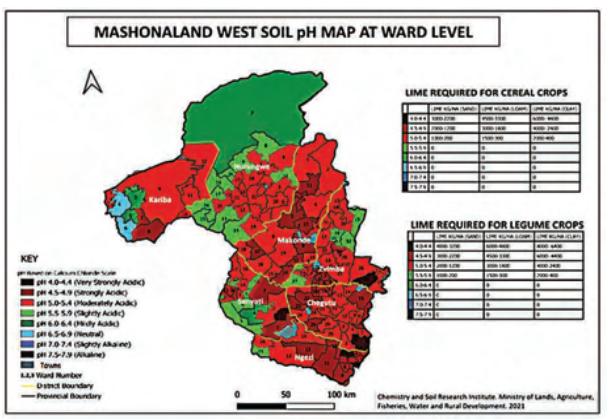


5. Manicaland

• Soils in Makoni district are dominantly acidic.
• All districts have at least 50% of the soils acidic. This follows the high rainfall belt.
• More arid parts of the province have higher pH values (northern end of Nyanga, southern end of Mutare, northern parts of Chimanimani and the western border parts of Chipinge bordering Bikita district.

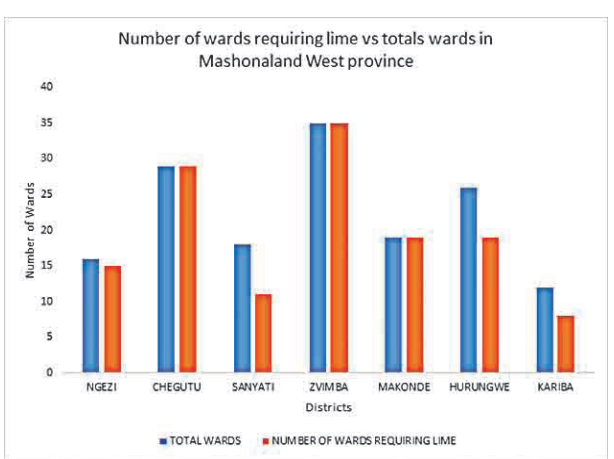


Lime is required in 71 percent of the wards. The demand for lime in terms of wards that require lime per district is as follows: Makoni (100 percent), Buhera (73 percent), Mutasa (72 percent), Nyanga (71 percent), Mutare (67 percent), Chipinge (60 percent), and Chimanimani (43 percent).



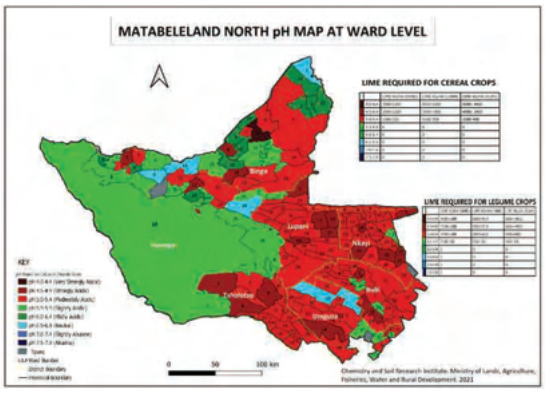
6. Mashonaland West

• Most parts of the province are acidic.
• Makonde, Zvimba, Chegutu and Ngezi districts are predominantly acidic.
• Sanyati, Kariba and Hurungwe districts have parts that have higher pH values which do not require lime.

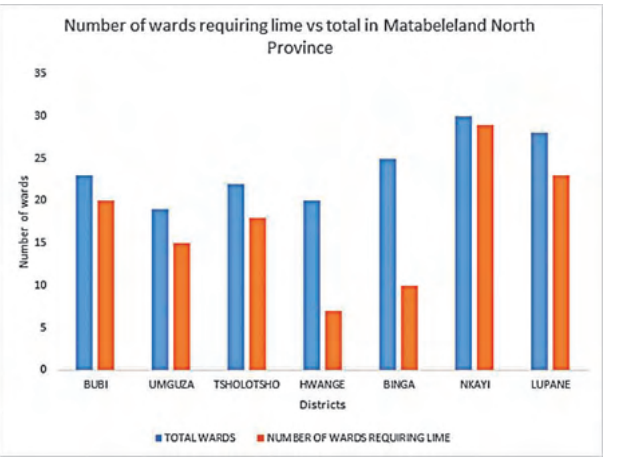


Lime requirements of the province is the greatest with 88 percent of the wards requiring lime. All the wards in Chegutu, Zvimba and Makonde districts require lime. The trend is as follows: Chegutu (100 percent), Zvimba (100 percent), Makonde (100 percent), Ngezi (94 percent), Hurungwe (73 percent), Kariba (67 percent) and Sanyati (61 percent).

7. Matabeleland North



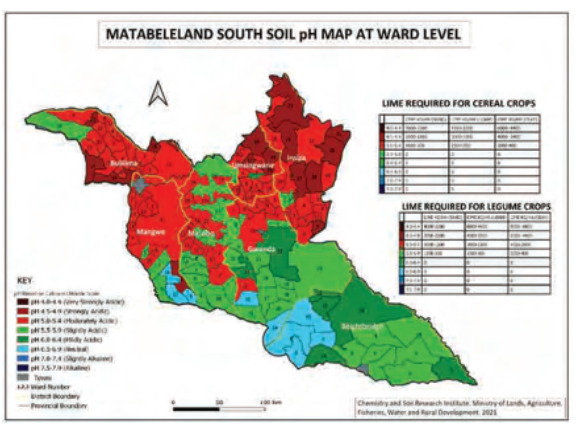
• Tsholotsho, Lupane and Nkayi districts are predominantly acidic.
• Bubi and Umguza districts have parts that have higher pH values which do not require lime.



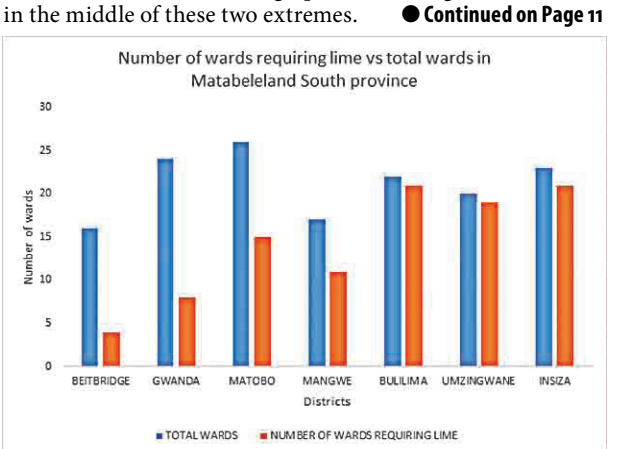
The driest districts in the province, Hwange and Binga, require the least amount of lime in terms of the proportion of wards that are acidic.

The other five districts require more lime. The trend is as follows: Nkayi (97 percent), Bubi (87 percent), Lupane (82 percent), Tsholotsho (82 percent), Umguza (79 percent), Binga (40 percent) and Hwange (35 percent). Overall, the province has 73 percent of the wards requiring lime.

8. Matabeleland South



• Bulilima, Umzingwane, Insiza and Mangwe districts are predominantly acidic whereas Gwanda and Beitbridge districts have dominance of high pH soils. Mangwe district falls in the middle of these two extremes. ● Continued on Page 11



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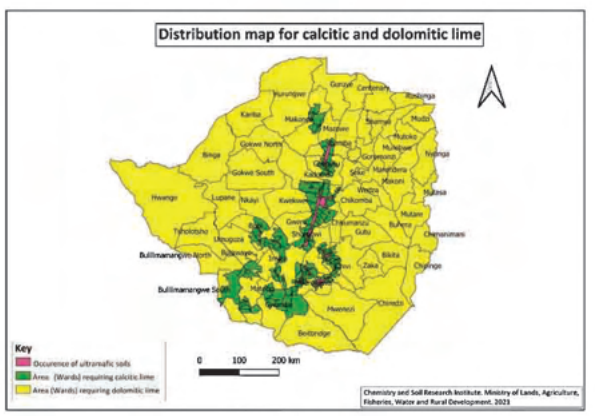
The driest districts, Beitbridge and Gwanda have the lowest number of wards that require lime. The soils are generally alkaline or slightly acidic. However, districts that receive higher rainfall, Insiza, Umzingwane and Bulilima, require more lime.

Soils are acidic and would need to be conditioned by lime application. The trend for the need for lime in terms of percent of wards is as follows: Bulilima (95 percent), Umzingwane (95 percent), Insiza (91 percent), Mangwe (65 percent), Matobo (58 percent), Gwanda (33 percent) and Beitbridge (25 percent). About 67 percent of the wards require lime in Matabeleland South province.



Areas that lie along the Great Dyke are have ultramafic soils. These soils have more magnesium than calcium. This therefore makes them have inverse Ca: Mg ratio. For optimum crop productivity, soils must generally have more calcium than magnesium, with Ca: Mg ratio of 4:1 as optimum. When liming soils with inverse Ca:Mg ratio, calcium-based lime should be used.

Therefore, calcitic lime ($CaCO_3$) is recommended for those wards marked green on the map which already have dominance of magnesium. The rest of the country would require dolomitic lime (Calcium magnesium carbonate, $CaMg(CO_3)_2$).

Provinces, districts and wards that require calcitic lime.

Province	District	Wards
Mashonaland West	Makonde	3, 4, 6, 11
	Zvimba	6, 20, 21
	Chegutu	11, 12, 19, 21
	Kadoma	3, 8, 9, 10, 11, 12, 13
Midlands	Kwekwe	2
	Chirumhanzu	12, 19, 22
	Shurugwi	1, 5, 6, 12, 17, 18, 21
	Gweru	13, 14, 17, 18
	Mberengwa	1, 2, 3, 5, 6, 7, 8, 9, 11, 13, 17, 34, 35, 36
	Zvishavane	19
Masvingo	Masvingo	9, 33
	Chivi	1, 2, 5, 6, 8, 9, 10, 11, 12, 15, 16, 17, 18
Matabeleland South	Insiza	1, 2, 3, 7, 8, 14, 18, 22, 23
	Umzingwane	13
	Gwanda	21, 22, 23
	Matobo	2, 6, 7, 8, 9, 10, 11, 24
Matabeleland	Bubi	1, 10, 11, 13, 21, 22, 23

Emmanuel Chikwari is the Head, Chemistry and Soil Research Institute Department of Research and Specialist Services, Ministry of Lands, Agriculture, Fisheries, Water and Rural Development

Quelea: a menace in wheat production

Shingirayi Nyamutukwa

THE Red-billed Quelea is the most damaging pest of wheat, sorghum and millet in Zimbabwe. Quelea is a small passerine bird that has caused havoc in wheat growing areas of Zimbabwe.

Flocks of more than 50 000 birds are seen hovering on top of wheat fields ready to feast on the already near maturing crop. Damage caused is extensive and unless closely guarded the troublesome bird can rob millions of tonnes from the farmer. The average quelea bird eats around 10 grammes of grain per day and a flock of two million can devour as much as 20 tonnes of grain in a single day.

The birds can cause more than 95 percent of wheat damage while rodents and insect pests cause minor damage. Management of quelea birds is therefore critical if targeted yields are to be realised.

Chemicals used in quelea control are Fenthion or Cyanophos, which are applied in breeding and roosting sites but only by official experts. Management of the birds during breeding time early each year helps reduce their populations so that there is reduced damage to sorghum and millet crops as well as winter wheat.

Other options available for quelea control include bird scaring and harvesting for consumption through the collection of nestlings from breeding colonies just before they fledge. Trapping birds by teams with hand held, cast and large stationary nets can be used to harvest the birds. The indigenous use of wax from mopane also helps reduce populations. While humans can set traps and harvest the birds for sale to generate income or use as relish, methods used do not significantly reduce the numbers.

Gift Jambaya aka "Mr Tsuro" pats one of his breeders at his plot

When passion for a pet reproduced a herd of rabbits

Elton Manguwo

A HERD of 1 100 rabbits and five hectares of cabbage and lettuce!

This best sums up the activities of one 47-year old Gift Jambaya on his plot along Good Hope Road in Westgate area of Harare. The plot has been his home for the past 12 years after growing up in the dusty streets of Highfield high-density suburb.

Jambaya's story is quite intriguing to say the least. After moving from Highfield as a grade fiver, he was to settle in Mabelreign, just a few kilometres from his current home where he started keeping rabbits as pets.

But the boy's passion to keep the large-eared creatures with muscular hind legs and an upper lip that is split kept growing. In 2012 he moved to his current place to start keeping them on a large but commercial scale.

He started the ambitious project with two rabbits and as the herd began to grow he realised he needed a corporate identity, which subsequently saw him christening himself 'Mr Tsuro,' (Shona name for rabbit), which has stuck on him like glue. The community around him now passionately calls him 'Mr Tsuro,' a name he has become so used to that he can easily fail to realise that he is the one being addressed if someone calls him using his original name – Gift or surname Jambaya.

With his project flourishing, Mr Tsuro started participating at the then Harare Agricultural Show. At the just-ended Zimbabwe Agricultural Show he scooped 21 different accolades in rabbit production.

"I was motivated to participate at the shows by the white farmers I often saw with rabbit cages at the then Harare Agricultural Show," said the soft-spoken Mr Tsuro recently.

His day starts with early morning check-ups of the rabbits and ends with late night check-ups too to make sure everything is in place.

Armed with the technological savvy to survive in the modern concrete jungle of the corporate world, Mr Tsuro a computer engineer by profession who studied IT and micro-technology engineering now survives on his childhood enthusiasms. From supplying computer hardware as a 23-year-old man trying to find his place in the world, Mr Tsuro is now providing rabbit meat and breeders to all four corners of the country.

Mr Tsuro sells his rabbits to major retail outlets such as OK, Bon Marche, Food Lovers Market and TM that sell the rabbits as meat. Mr Tsuro explained how he integrated his farming operations by fixing rabbit cages, offering lessons and breeders to would-be farmers so that he can benefit from the whole value chain.

"I do about four projects weekly. I fix and supply cages and breeders so that the rabbit industry can grow and expand to meet the domestic demand, as the current retail uptake rate is insatiable and hungry. Cleverly, by satisfying the domestic market the excess will open up some new horizons for the export market," Mr Tsuro said.

Mr Tsuro also leverages on the accessibility of social media platforms such as WhatsApp for marketing information. He is a member in over 10 WhatsApp groups that have over 500 participants each — people who want to learn and enter the rabbit production subspace.

Besides the five people he employs to help him with the day to day operations, Mr Tsuro is happy to be empowering a lot of other people along the value chain.

Said Mr Tsuro: "Serious youths are engaging in rabbit farming and are just eager to take the project head on. When I started my rabbit project most people were cynical about the project while agricultural shows provided me with the platform to score a number of sales. I have always tried to capture the relevance of the show by making sure that I market my brand and business."

He acknowledges that he has managed to build a good market that is consistent and always hungry for rabbit meat.

> I plan to be the biggest supplier in Africa and most importantly, I want to be the biggest in the world and I have crafted a roadmap in which in the foreseeable five years, I want to feed the whole country making sure every butchery has rabbit meat.

"My market is any person. Wherever there is a mouth, there is my market," Mr Tsuro joked recently.

He feeds his rabbits with pellets supplemented with dry hay and greens especially for mothers that would have given birth, as they tend to lose appetite for hard pellets.

In addition, Mr Tsuro said: "This is no longer a hobby. Am now a businessman through agriculture therefore."

Mr Tsuro does not hide how being a household brand in the rabbit industry has been helping him mitigate feed challenges, as he has been attracting feed manufacturing companies such as Hyper Feed to sign marketing endorsement deals that result in him getting discounts on feed purchases.

As a business man he stresses how he had to shift from the idea of keeping rabbits as a hobby to building the current large herd. He keeps the rabbits in groups based on their projected value. Six to eight weeks' breeders are priced at US$20 each while the fully grown rabbit breeder will go for US$50. However, for meat supplies to retail outlets, he sells them at US$10 each.

Mr Tsuro does not see the sky as a ceiling, as he plans to up-scale his operations to greater heights.

"I plan to be the biggest supplier in Africa and most importantly, I want to be the biggest in the world and I have crafted a roadmap in which in the foreseeable five years, I want to feed the whole country making sure every butchery has rabbit meat. I plan to start tanning the rabbit leather, as it is the first product of rabbits.

"The major highlight of my rabbit project was when the President visited my stand and appreciated my displays at the Zimbabwe Agricultural Show. This was when I also realised that the project can take me to places and offices that I have never been to. Most importantly, it can propel me to greater heights that I never imagined in my life," observes Mr Tsuro.

Like every business the highest moments are always followed by the lowest of times, the rabbit breeder says as he relates how he would sometimes run out of feed at the beginning of his project.

Mr Tsuro's biggest undoing at the moment is the lack of a place of his own. The idea of moving from one place to another is stalling growth, as he cannot invest in land development.

Interestingly, the rabbit project has since catapulted him into the horticulture industry where he is producing cabbages and lettuce on five hectares of land. Proceeds from rabbit sales made the move possible.

"Besides the rabbit business generating the capital for borehole drilling and drip irrigation, the urine and waste from the rabbits give me the ultimate ingredient for my composts that I use to fertilise my horticulture products giving me purely organic produce," Mr Tsuro proudly confesses.

A product of time, who has always been equipped with an entrepreneurship spirit and mind-set, Mr Tsuro prides in the reality that he has never worked for anybody in his life but has always slaved in realising his vision.

"There are things you do not learn in the classroom – they just come from a deep passion within you. The zeal to push forward and the heart to stand the hard times when the odds are against you are all you need," says Mr Tsuro emotionally as he reminisces on how people laughed at him when he started rearing rabbits.

Youths that are beginners in the business must stay on course and be focused especially when they start realising the fruits of their sweat, advises Mr Tsuro.

Tobacco agronomic practices for sustainable, economic production

'Enabling your choice of variety to attain its yield potential'

Chinaniso Chibudu

Profitable production of tobacco depends, amongst other factors, on effective and sustainable management practices.

While Kutsaga tobacco varieties have a yield potential of up to 5 tonnes per hectare, the national average yield for tobacco production in Zimbabwe remains below 2 tonnes/ha.

Factors affecting yield include; poor pest and disease management &, non-adherence to cultural and agronomic practices.

Outlined below are some tobacco agronomic practices that growers should use for sustainable and economic production.

Seedling selection and transplanting

Selecting the correct tobacco variety suited to the growing region is very important. Growers should also note that, careful selection of seedlings at transplanting is critical for a good stand.

An ideal seedling for transplanting should be 10-15 cm in height, pencil thick, well hardened and free from disease infection or insect damage. Any seedlings which are below this standard are subject to transplanting shock and thereby reduce crop stand.

Old seedlings (>90 days) should be avoided as these tend to flower early reducing yield. As a general rule, triadimenol should be applied two days before transplanting to prevent soreshin in the field.

Transplanting

For dry planting the field should be pre-irrigated two weeks before planting. It is important to have adequate amount of water in the hole to ensure seedling survival. Planting holes should be deep and large enough to accommodate between 3-5 L depending on the amount applicable for a particular field. A prior test to determine the amount to apply is done a day before transplanting by holing out 3 holes in which 3, 4 and 5, litres are added consecutively. The minimum amount that would have linked-up with the residual moisture 24 hours later would be the ideal amount to use in that particular field.

Basal fertiliser application

The tobacco plant requires macro-elements such as (nitrogen, phosphorus potassium, magnesium and sulphur) and minor elements such as Boron for improved yields and quality. These are provided for in compound fertilisers and high analysis blends as basal applications as per soil analysis recommended rate. Effective and efficient use of fertilisers depends on soil testing, appropriate selection of nutrient source and efficient placement methods that enhance efficient utilisation of supplied nutrients in in order to increase yield and minimizing fertiliser cost. Growers must apply only the amounts required by the crop (established through soil testing), at the right place, right time and right amount.

Basal fertiliser is tractor applied during ridging or it can be hand-applied as banding on both side of the plant within 7 days after planting at about 10 cm from the plant crown and at the rooting zone to avoid fertiliser burn.

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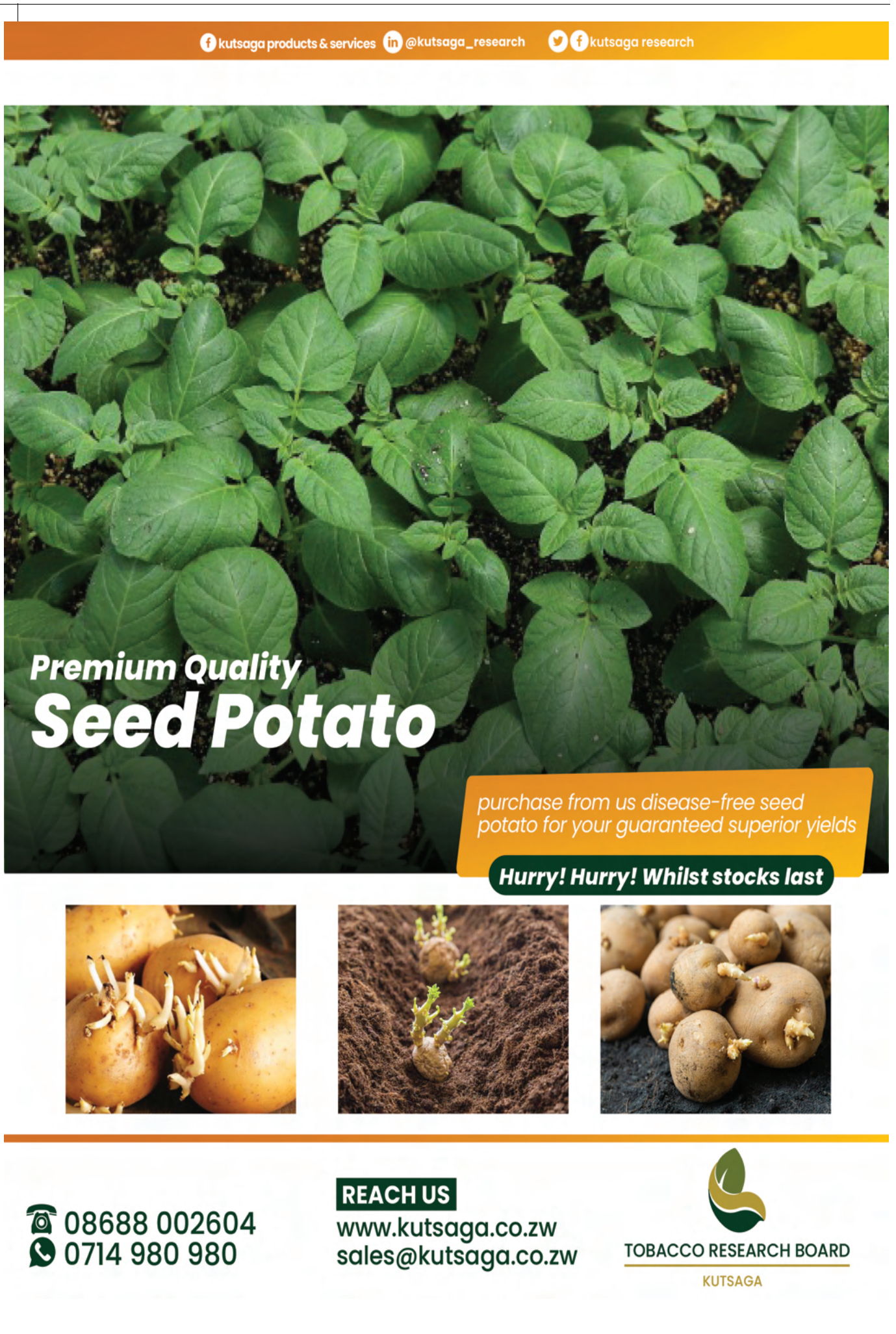

Tobacco agronomic practices for sustainable, economic production

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Top dressing

Tobacco requires adequate nitrogen for reasonable maturing time and leaf curability during its major growth period but with the amount decreasing rapidly from topping time onwards.

Sources of nitrogen for side dressings that can be used include ammonium nitrate, sodium nitrate, calcium nitrate and potassium nitrate.

Nitrogen fertilisers are applied using the dolloping method and the fertiliser should be placed 10 cm away from plant and 5 cm deep and covered unless it is applied under wet conditions.

As a general guide, for the early ploughed land (up to March) apply 25 kg N/ha at 3-4 weeks after planting. For the late ploughed land (from June onwards) dollop in an 8-ml cup/plant of fertilizer ammonium nitrate.

For cultivars requiring extra top dressing at topping (e.g. KRK26, KRK28), apply a 5-ml cup/plant of an all nitrate-nitrogen fertilizer (e.g. calcium nitrate or nitrate of soda) at topping. If an all nitrate fertilizer source is not available, apply a 2-ml cup of fertilizer of ammonium nitrate a week before topping.

Weed Management and Herbicide application

It is important to keep the tobacco crop free of weeds during the period of major growth. Methods of weed control include hand-weeding or by a combination of chemical, hand or mechanical methods.

The most efficient way of controlling weeds is herbicide application however, this needs careful understanding of the label in relation to the weed spectrum and application amount to avoid damage to the plants. It must be remembered that herbicides, will only become active in the soil when it is wet by either irrigation or rain.

Herbicides can be applied at pre-ridging, post-ridging, pre-planting before holing out and at post-planting.

Herbicide sprays must be directed towards the base of the crop to avoid direct contact with the apical bud. It is recommended that sprays be done early in the morning when there is no wind.

Topping and Sucker control

If the tobacco crop is not topped on time this will result in low yield and poor tobacco grades of the cured leaf.

Topping with normal fertilisation and standard flowering cultivars should be done as soon as the plants attain 18 reapable leaves where the apical bud is removed as shown in Fig 2. Topping up to 22 leaves has been shown to be less profitable in most of the varieties except for some mammoth ones.

Topping results in sucker development. Sucker control can be achieved manually through hand-suckering or chemically through the use of suckercides.

Manual sucker control however, is time-consuming and labor-intensive thus, the use of suckercides is recommended when suckers are less than 2cm in length.

Suckers longer than 2cm should be removed mechanically and suckercide should not be applied when plants are wet from rain or dew or when the plants are badly wilting.

Conclusion

The government in 2021 approved the Tobacco Value Chain Transformation Plan, as presented by the Minister of Lands, Agriculture, Fisheries, Water, Climate and Rural Development.

The Plan aims to transform the tobacco value chain into a US$5 billion industry by 2025 with one of the pillars being increased production and productivity from 262 million kilogrammes to 300 million kilogrammes by 2025.

For the nation to achieve these targets, tobacco production needs to be done in a sustainable manner including through the use of tobacco best management practices as outlined above.

For more information, contact Kutsaga Research Station's Crop Production and Molecular Technologies Division VOIP 0868 800 2604 or Email: tobres@kutsaga.co.zw

Figure 3. a) Bud topping. *b) Avoid splashing of suckercide on the uppermost leaves*

Figure 2 a) Use a stick to make hole *b)Place AN in hole and cover*

Figure 4: Poor sucker control (left) and good sucker control (right).

● ***Chinaniso Chibudu is the Senior Plant Physiologist at the Tobacco Research Board***

Fig. 1: Rotation using G HR1 Katambora grass variety in tobacco lands

Seedbed Pest and Disease Control

"Enabling your choice of variety to attain its yield potential"

Cleopas Chinheya

Insect pests cause direct and indirect damage to tobacco crops making their management important. There are major and incidental pests and more specific pests for the conventional and float seedbed.

The major seedbed pests the grower should be wary of are cutworms, aphids, leaf miners and eaters. Cutworms cut the stems of the seedlings reducing survival rates.

Aphids cause black sooty mold on the leaf and are mostly economically important due to their aphid-transmission ability. Their management in the seedbed by the grower is therefore important to reduce the risk of viruses in the field.

Float Tray System Pest and Disease Management

The float tray system has a lot of advantages over the conventional tobacco seedbed system since it employs economically IPM methods.

Some of the advantages of the float tray system include use of fewer and smaller quantities of chemicals, lesser disease and pest incidences and use of less water and fertilizers. Additionally, the use of the float tray seedling method eliminates the problems of the economically important root-knot nematodes.

Algae in trays and water, seedling root rot caused by Pythium and Rhizoctonia spp. are the three major challenges that have been brought about by the float-bed seedling production system.

These are attributed to the constantly moist environment in this system.

Pythium Root Rot

Pythium is a major disease of tobacco float tray seedling production systems. Symptoms of Pythium root rot include yellowing of leaves, wilting, and rotting of the roots. Disinfecting used float trays using sodium hypochlorite (5% concentration) seven days before sowing also reduces disease incident in the float beds.

Rhizoctonia Damping Off

The first symptoms of Rhizoctonia damping-off is a small water-soaked lesion on the stem base that rapidly becomes brown and sunken. Then, lesions constrict the stem which leads to stem break-off.

Unlike Pythium damping-off, seedlings die without leaves yellowing and the root system can remain clean and intact with only the base of the stem turning brown. Chemical treatment is effective for soreshin control.

Algae

Algae growth in the floating tray water is preventable by ensuring that the entire water bed surface is covered with trays and no gaps are left.

Fungus Gnat

The major float-bed specific insect pest is the fungus gnat which is promoted by a build-up of algae, common in very moist conditions of media and stagnant water. Primarily, the reduction of excess moisture and organic debris by the grower is important for control of the fungus gnat.

Conventional System Pest and Disease Management

Root-Knot Nematodes

Root-knot nematodes (Meloidogyne spp.) are among the most economically important pests on tobacco causing yield and quality losses if management measures are not applied.

Infected plants develop root galls and this is often accompanied by stunting, chlorosis and wilting of the plant.

Thus, where high root knot nematode (RKN) infestation exists, crop failure is inevitable. For tobacco growers to sustainably produce their seedlings there is need for an IPM approach for pest and disease management or adopt the float tray seedling production system.

Researchers at the Tobacco Research Board have for years been undertaking work on

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Fig 2 Application of metham sodium fumigant nematicide in the conventional seedbed

Seedbed Pest and Disease Control

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development of sustainable pest management options notably greener alternatives, suitable rotations, cultural and biological control methods and development of RKN-resistant varieties.

The use of non-host crops in rotations with tobacco is one of the potential alternatives to the use of synthetic nematicides and fumigants as it suppresses RKN populations.

The inclusion of Katambora grass (G HR1) (Fig. 1.) or sunnhemp treated with Trichoderma harzianum (T77) in the seedbed off-season as a relay crop suppresses nematode and soil-borne pathogen populations in the conventional seedbed. Trichoderma harzianum (T77) and Katambora grass (G HR1) are available at Kutsaga Research Station.

Chemical control also helps to manage root-knot nematodes in the seedbed.

Among the effective products available that growers can use in tobacco seedbeds are the nematicides Metham-sodium, 1,3-Dichloropropene (or 1,3-D) and Abamectin (Fig. 2.).

Insects

Conventional seedbed specific insect problems start with soil inhabiting species. These include white grub, false wireworm and termites. While these may be treated during fumigation, growers who do not fumigate soils require insecticides.

Management of seedbed insects can be successfully achieved using integrated pest management (IPM), which reduces the dependency on chemical control options. IPM includes cultural control methods such as rotations to reduce soil insects, legislation to minimize carryover from one season to another, chemical interventions, when necessary, use of monitoring and trapping tools and biological agents. Biological agents such as Beauveria bassiana have shown to be effective against a wide range of insects and their use in managing soil insects is promising.

The Kutsaga Gnatbuster, is a yellow sticky trap that as part of research innovation has been shown to be an effective monitoring tool for insect pests such as fungus gnat, aphids and whiteflies (Fig. 3.).

This reduces populations while also assisting the grower to note pest levels and make relevant decisions on necessity and timing of chemical intervention. The traps are available at Kutsaga Research Station.

Conclusion

It is recommended that growers seek advice from the Tobacco Research Board should there be any queries on application of any product in the seedbeds and indeed other tobacco related matters.

For more information, contact Kutsaga Research Station's Plant Health Services Division on telephone # 086 8800 2604, Whatsapp 0714 980 980 or Email: tobres@kutsaga.co.zw or visit Kutsaga Research Station, Airport Ring Road, Harare or Business Media: Twitter & Facebook: Kutsaga Research, Facebook: Kutsaga products and services

Fig 3 Kutsaga Gnatbusters in the greenhouse