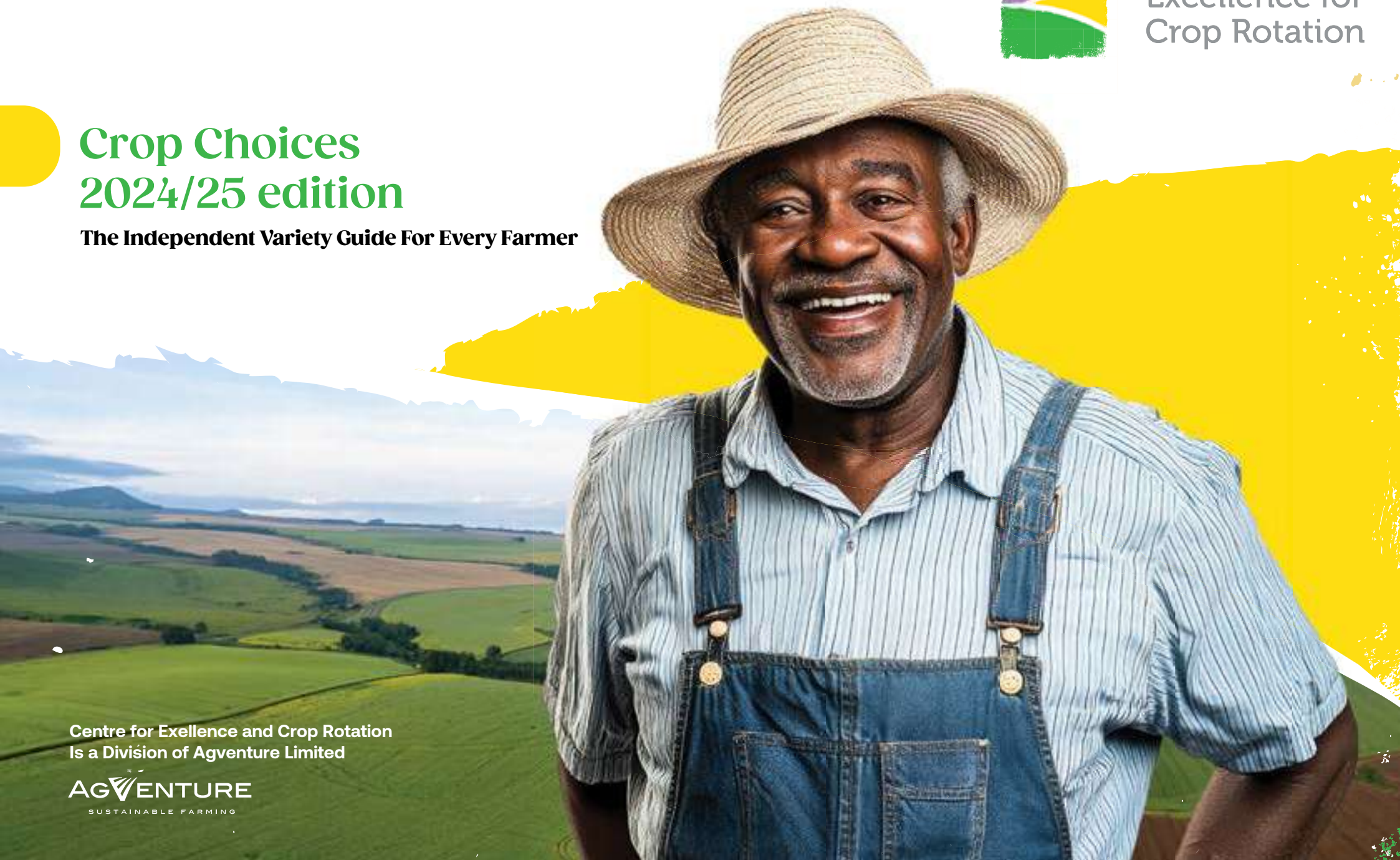
Centre of Excellence for Crop Rotation

Crop Choices 2024/25 edition

The Independent Variety Guide For Every Farmer



Centre for Exellence and Crop Rotation
Is a Division of Agventure Limited

AGVENTURE
SUSTAINABLE FARMING

1. Maize

Kenya produces around 3.5 million tons of maize every year making it by far the largest crop. As a result we have more choice of seeds than any other. But how do you decide on a suitable variety with such a wide range of geographies?

The most important point to remember is that what is written on the seed packet is not necessarily a good nor indeed accurate reflection of whether a variety is suited to certain conditions – how a new variety performs relative to established hybrids is only half of the picture; the other major part is how does the farmer intend to grow the crop.

We have grouped the varieties into how the breeders would classify them according to Highland, Medium Altitude and Fast (or perhaps Tropical / low altitude) varieties.

These have been tested at several sites in Nakuru County, Trans Nzoia, Laikipia and Meru County over 8 seasons now, to give a fair representation of the expected performance over several seasons.

But remember that variety alone is actually a very small part of the total picture; choosing a variety with the right agronomic characteristics such as standing power, the ability to thrive at higher populations, uniform seed for even emergence, using an appropriate fungicide strategy and ensuring soil structure, rotation and nutrition are taken care of has a far greater impact.

Several of these trials have yielded over 15 tons/ha (66 bags /acre); far in excess of the 1.8 t/ha (8 bags/acre) national average.

	Type / zone	Yield as a % of controls (6.9 t/ha)	Standing power	Grain quality	Rust	NCLB	Gray Leaf Spot	Stalk Rot	MLND Resistance (yes/no)
P3812W	Highland	110	7	7	4	8	8	7	
DK 777*	Highland	108	8	9	7	7	8	8	Yes
EAS 600-23A	Highland	99	5	5	7	7	8	5	
DK 90-89	Highland	99	8	8	6	7	8	7	
SY 594	Highland	98	7	7	7	7	6	6	
30G19*	Highland	97	7	8	9	8	8	6	
KS 6213	Highland	97	5	6	8	8	8	7	
KS 6218*	Highland	96	6	6	8	8	8	7	
Pan 691*	Highland	93	5	5	8	8	8	7	
SC 83	Highland	91	6	6	8	7	6	7	
KS 624	Highland	88	5	5	8	8	8	7	
H6506	Highland	86	6	7	8	8	8	7	Yes
WH605	Highland	85	7	7	8	8	8	7	
EAS 600-15A	Highland	84	3	6	8	8	8	7	
KS 629	Highland	62	6	7	8	8	8		
SC 73	Highland	(limited data)	7	7	9	9	7	7	
9M-91	Highland	(limited data)	7	7	7	8	8	7	Yes
Advanta 2304	Medium	119	7	7	7	8	8	7	
Pan 7m-81	Medium	105	8	8	8	7	8	7	
Advanta 2308	Medium	100	7	7	7	8	8	7	
Pan 15	Medium	97	8	6	7	7	8	7	
SC 61	Medium	82	7	7	8	8	7	7	

WH507	Medium	77	7	7	8	8	7	7	
KS 522	Medium	71	7	7	7	7	7	7	
KS 516	Medium	69	7	7	7	7	7	7	
SC 53	Fast / low	97	7	7	7	7	7	7	
SC 43	Fast / low	86	7	7	7	7	7	7	
Pan 4m-19	Fast / low	83	4	6	7	7	7	6	
DK 8031	Fast / low	81	7	8	5	7	7	7	
DK 8033	Fast / low	68	7	7	5	7	7	7	

Notes:

- The control varieties are show with an asterix '*'. The results of all other varieties are shown as a percentage (%) of the average of the control varieties – a widely grown group of varieties in highland areas.
- Type – this is a lose categorisation based on breeders intended geographic suitability.
- Scale 1-9; where 9 demonstrates the character to a high or favourable degree, for example good disease resistance.
- [ ] Data in brackets means that more trials and experience are needed for full confidence.
- MLND = Maize Lethal Necrosis Disease. This is based on breeders claims and confirmed by our observations in the field, particularly in off-season trials under very high pressure.

2. Wheat

Kenya has typically produced 300-400,000 tons of wheat in the last few years, a significant shortfall of the near 2 million tons that is imported each year. With average yields around 2 t/ha there is significant ground to be made up to utilise the enormous potential of the crop in Kenya.

Significant efforts have been made by CIMMYT and KALRO to introduce new varieties with improved yields and Stem Rust resistance with introductions such as Hyrax, Impala and Jacana in recent years. Agventure has produced Certified Seed for many of these varieties which it has made available to farmers and returned a royalty to the breeders – an important step to improve investment in breeding for the betterment of farmers.

Stem Rust has a significant effect on wheat production cost and risks, costing up to 50% of yield if uncontrolled. As Rust races are continually adapting and changing, new varieties need to be introduced as often as every few years to ensure that the genetics are reliable and effective. A new Yellow Rust race has appeared in the last 12 months, referred to as PstS16, which has proved to be virulent against many current varieties.

Other important characteristics include lodging resistance, sprouting in a wet harvest, and susceptibility to Fusarium and Yellow Rust in certain geographic locations.

	Control yield Highland	Control yield Rift Valley	Grain type	Sprouting resistance	Bushel weight	Stem Rust	Crown Rot	Yellow Rust	Septoria	Fusarium	Speed of maturity	Straw strength	Crop height
	5.5 t/ha	4.6 t/ha											
Robin	107	96	Red	Good	Good	3	7	3	5	7	Moderate	7	Mod
Hawk	106	89	Red	Good	Good	3	6	4	6	8	Mod-fast	7	Mod
Korongo	109	95	White	Poor	Very good	3	6	6	4	4	Moderate	6	Mod
Brambling	97	99	White	Poor	Very good	6	6	4	5	3	Fast	9	Short
Mwera	103	107	Red	Good	Very good	7	7	5	6	8	Very slow	8	Tall
Hyrax	87	93	Red	Good	Good	8	7	8	6	6	Slow	9	Mod
Kasuku	96	107	Red	Poor	Very good	6	4	4	6	4	Fast	9	Short
Impala	89	107	White	Poor	Very good	8	6	9	6	6	Moderate	7	Mod
Jacana	96	96	Red	Good	Moderate	8	6	6	6	7	Moderate	7	Mod
Njoro 2	90	69	Red	Good	Moderate	7	6	5	6	8	Mod slow	5	Mod
Pweza	101	[-]	Red	[-]	Moderate	[8]	[6]	[9]	[6]	[7]	Moderate	4	Tall
Turaco	98	[-]	White	[-]	Moderate	[7]	[6]	[9]	[6]	[5]	Moderate	5	Tall

Notes:

- Highland – areas above 2,200m altitude (Timau and Mau Narok). Rift Valley – Nakuru and Uasin Gishu.
- Control yields are a % of the average yield of Kasuku, Robin and Mwera – three popular and well established varieties.
- Sprouting resistance for newer varieties is based on simulated trials in controlled conditions, so caution must be exercised.
- Data in brackets [ ] indicates a limited data set, so more trials are required to build up a high level of confidence.
- Disease. This is based on breeders claims and confirmed by our observations in the field, particularly in off-season trials under very high pressure.

3. Barley

Malting barley for brewing remains a key crop in many high altitude areas of the country such as Mau Narok and Timau but newer varieties, notable RGT Planet, with greater adaptability have expanded the potential area suitable for the crop.

Quality in terms of malting ability, grain nitrogen content and screenings (small grains) is paramount so varieties are subject to very careful scrutiny by maltsters; without approval and recognition by the end-user even a variety with the highest yield and agronomic characteristics will not succeed.

Barley varieties are generally very adaptable as unlike wheat they are not dependent on day length for flowering. This means that top genetics can be introduced from afar, once tested and released here, saving time in breeding and selection.

Net Blotch remains the most prevalent disease in barley across most areas of the country, commonly reducing yields by 15-20% where left untreated in trials, but Ramularia is also an important disease that has only recently been identified in Kenya.

Barley tends to suit cooler, higher altitude locations and tends to be more tolerant to Take-All disease and to Free-Living nematodes than wheat, but more susceptible to Rhizoctonia. Laureate and Propino have recently been released, and two new candidates – Malgas and Neptune are undergoing National Performance Trials.

	Control yield	Net Blotch resistance	Ramularia resistance	Straw strength	Screenings	Maturity speed	Grain Nitrogen
	4.6 t/ha						
RGT Planet	100	4	6	6	Very low	7	Low
Grace	89	6	6	7	Low	8	Moderate
Laureate	97	6	6	5	Low	5	Low-mod
Propino	90	3	5	6	Low	6	Low-mod
Malgas*	[92]	7	[6]	5	Low	8	Moderate
AGV Neptune*	[98]	8	[6]	5	Low	6	Moderate

**** Malgas and AGV Neptune are undergoing National Performance Trials and are not yet released.***

4. Canola

Canola is a relatively new crop in Kenya that is very well suited to a range of environments, and helps solve many of the problems facing farmers today. As a non-cereal break crop it thrives in wet conditions, requires minimal specialist machinery, has a ready market for oil crushing for use in the domestic cooking market, reduces soil-borne diseases and grass weeds such as Brome and Ryegrass. The weed control benefits alone have a direct and immediate effect on the yield and profitability of the following cereal crop and often add over a ton per hectare of yield to the next wheat or barley crop.

Two main groups of varieties exist; those of Australian origin which are slightly lower yielding in the very best growing conditions but are more drought and heat tolerant, and European-types which take longer to mature but tend to be much taller and suited to cooler, softer growing conditions above 2,000 metres altitude and with over 300mm of rainfall in the crop. These taller types can be a challenge to harvest with small combines, so growers are advised to discuss their individual situation with an advisor from the Centre of Excellence for Crop Rotation.

A range of herbicides are now available helping growers control broadleaved weeds reliably as well as grasses. The small seed requires care at seeding to ensure a good establishment and uniform crop.

Three new varieties join the list last year – KWS Jazz, Hyola Blazer TT and Lumen, from three different breeders giving growers excellent choice. Several more are in the pipeline and yields continue to improve at 1-2% a year as breeders introduce new material.

	Control Yield	Drought tolerance	Straw strength	Maturity speed	Blackleg / Stem Canker resistance**	Type	Crop height
	2.9 T/ha						
Hyola Blazer	93	Very good	8	Mod-fast	9	Hybrid	Moderate
Hyola 350TT	92	Very good	6	Ultra fast	9	Hybrid	Very short
Click CL	91	Average	7	Very slow	5	Hybrid	Very tall
Lumen	106	Average	8	Slow	5	Hybrid	Tall
KWS Jazz	113	Very good	5	Moderate	4	Hybrid	Mod-tall
Lakritz*	[100]	[Average]	8	Mod-slow	4	Hybrid	Tall

**** Lakritz is currently undergoing National Performance Trials and is not yet released.***
***** 1-9 scale of disease resistance, where 9 = very good resistance.***

5. Peas

Combining peas or dry peas as they are sometimes know are a somewhat niche crop for the experienced grower, but they are highly marketable and bring significant benefits to the rotation for broad acre farmers large and small. First and foremost, as a legume peas have the potential to fix large amounts of nitrogen in the soil for the following crop, and leave a very friable, well-structured soil.

They also reduce several species of free-living nematodes as well as Take-All and Crown Rot diseases. Grass weeds can be controlled very easily with selective herbicides, and because of the speed of the crop peas can often be grown as an off-season break between two cereals, requiring minimal moisture.

Yields can be highly erratic however; a dry season can see yields of over 3 tons/ha (13 bags/acre) with a very good grain sample, however in wet years when Ascochyta pressure is intense, even the best fungicides will not be enough to avoid complete crop loss. Peas are very sensitive to compaction and waterlogging, so assessing soil structure at depth is essential before planting.

Lodged, flat crops are very difficult to harvest so standing power is an important factor in variety choice, as is the colour of the pea grain itself for the end market.

	Control Yield	Seed colour	Ascochyta resistance	Powdery Mildew	Standing power	Crop height	Seed size	Speed of maturity
	2.1 t/ha							
Bluemoon	100	Green	4	5	4	Short	Moderate	Fast
Greenwich	113	Green	6	3	6	Short	Large	Fast
Karioka	105	Green	5	5	7	Mod-tall	Mod-small	Late
Flam	-	Yellow	[5]	[5]	[7]	Mod-tall	Moderate	Late
Exam	-	Yellow	[5]	[5]	[7]	Mod-tall	Mod-small	Late
Kidam	-	Yellow	[5]	[5]	-	Mod-tall	Moderate	Mod-late
Karacter	[104]	Yellow	6	5	7	Mod-tall	Mod-small	Late
Kameleon	[93]	Yellow	6	5	7	Medium	Moderate	Medium

**** Karacter and Kameleon withdrawn from trials by breeder.***

Flam, Exam and Kidam are currently undergoing internal testing and are not yet released or in National Performance Trials.

6. Sunflowers

A new crop added to this edition of the Variety Guide, Sunflowers are an excellent, drought tolerant break crop in cereal rotations. The market for cooking oils globally is largely based around sunflower oil, the majority of which came from Ukraine so the 2022 conflict has changed the global supply situation significantly.

Agronomically sunflowers may not be the most profitable crop but it is an exceptional break crop in cereal rotations, being extremely drought tolerant, allow total grass weed control, easy harvesting and requires minimal inputs.

Sunflowers are high Mycorrhizal meaning they help following crops access more phosphate from the soil, they reduce nematodes and the root very deeply improving soil structure and the water holding capacity of soils. Several new varieties are under test in trials and are showing significant yield increases over the existing choices in the market.

	Control Yield	Seed type	Standing power	Height	Head droop at harvest	Speed of maturity	Oil content
KS Fedha	80	Black	5	Tall	Variable	Mod-fast	Moderate
Hysun 33	101	Black	4	Very tall	Upright	Slow	High
RGT Wollf	[110]	Black	8	Moderate	Upright	Moderate	High
RGT Vollcano CL	-	Black	8	Moderate	Upright	Mod-slow	High
AGV Jupiter	-	Black	8	Mod-short	Down	Moderate	High
AGV Arrakis	-	Black	7	Tall	Down	Slow	High

**** Wollf, Vollcano, Jupiter and Arrakis are all in National Performance Trials and are not yet released.***

How is Crop Choices Put Together?

Funded entirely by Agventure and the Centre of Excellence for Crop Rotation, Crop Choices was put together to provide factual, scientific information based on varieties to enable all farmers to make better decisions on what to grow and how they grow it.

The data is compiled from a network of over 15 trials sites across Kenya and is commercially independent; the objective is solely to improve farmer knowledge based on real results from around the country.

A first of its kind in Kenya, the guide aims to equip farmers with the knowledge to improve their farming and livelihoods.

Disclaimer: Agventure produces agronomic and seed information generated from its own trials. This information is shared with farmers in good faith - and should be used as a guide only. Multiple factors affect results; including but not limited to location, soil type, timing and weather conditions - and as such results may vary considerably in different situations. Farmers should always conduct their own trials to verify what works best in their specific conditions. Agventure makes no guarantees against the agronomic information provided

Agventure Ltd - Head Office
Office P. O Box 218,
Timau, 10406,
Kenya

Email: info@croprotation.co.ke
www.centerofexcellence.co.ke

Centre of Excellence for Crop Rotation

Centre for Exellence and Crop Rotation
Is a Division of Agventure Limited

AGVENTURE
SUSTAINABLE FARMING