



# Take a chance on grain maize

## Grain maize

**Maize is fast growing in popularity with increasing numbers of arable farmers believing it capable of delivering significant production, economic and even environmental benefits. CPM evaluates its potential.**

*By Rob Jones*

**With the challenging autumn and winter period making drilling difficult for many producers, coupled with reports of cereal seed stocks selling out by the end of November, maize has come under the spotlight as a contender for arable rotations.**

Better genetics, greater knowledge and improved management techniques means the crop has the potential to break out of its traditional livestock home and become a mainstream arable player, many believe.

It's certainly a crop that stacks up well against more conventional spring options, says KWS' technical maize specialist Andrew Cook, with many arable producers reporting strong gross margins and a range of associated benefits under the new Sustainable Farming Incentive (SFI).

"Significant reductions in nitrogen use, low-input agronomy and soil improvement

opportunities are just some of the appeal, and managed properly, maize can bring a welcome diversity to arable rotations.

"If you're located close to a dairy farm, beef producer or AD plant, there could be a local market for forage maize, but there's growing interest in maize as a grain crop too," he says.

### Preparation steps

"If you're growing maize for grain, it's important to load things in your favour to ensure you have a crop that's going to get to harvest. That means looking at the best site, the right crop establishment method and the most appropriate varieties.

"You're going to be harvesting later than forage maize because of the time required for the grain to dry down as much as possible, so you have to plan things as much as possible around achieving this."

Whether growing maize for forage or grain, the first objective is to choose the best site as this plays a key role in determining maize yield and quality, he points out.

"The easiest way to increase yield is to avoid sowing maize on non-performing fields. It's a crop that favours sheltered locations with a south-facing aspect which will permit earlier drilling and maintain soil temperature for longer in early spring.

"Sheltered fields also offer higher retention of heat units and radiation into the canopy, benefiting total yield potential. The recommended maximum altitude for maize is 1,000 feet (300m) above sea level."

**“I’m sure the deep-rooting effect of the maize has improved the soil profile.”**

According to Andrew, maize favours sandy/sandy loam soils, a well aerated soil structure and no compaction. "Clay soils hold water and are slow to warm up although maize can be grown on soils with a clay content of up to 25% if earlier drilling is used.

"Chalk is unsuitable because it's slow to warm up in the spring and can reflect sunlight. However, chalk downland soils can support maize if soil depth is sufficient. Poorly aerated soils will limit root formation and can cause premature crop senescence," he explains.

AICC member Howard Nason of Crop Advisors says cultivations for maize should be targeted to alleviate compaction and create a seedbed conducive for rapid establishment but minimised to avoid risks of soil damage and excessive fuel usage.

"Maize is the one crop that'll show up any form of soil compaction, so tramlines or heavy traffic areas of the field have to be

dealt with pre-drilling, but, there's no need to burn diesel unless you have to.

"Dig a hole to find the compaction depth and set the subsoiler point 1" (2.5cm) below the compacted soil — this will give optimum lifting of the soil. Where moisture isn't limiting, seedbeds can be left unrolled to help with water infiltration through the soil profile and avoid the risk of capping."

He explains that as the season progresses, if there's a concern about soil moisture it's advisable to Cambridge-roll the ground. "The seedbed has to be good enough to allow any planned pre-emergence weed control to be effective, while not being over worked."

Andrew agrees, saying maize doesn't usually require the energy-intense cultivations required by many other crops. "If you have a relatively well-structured soil, as a general rule you don't have to subsoil or plough before drilling which represents a considerable saving on machinery and diesel costs compared with other crops.

"Although maize likes to put deep roots down and doesn't do well in compacted soils, modern thinking is to deal with such areas individually rather than carry out wholesale heavy duty cultivation," he says.

Once soils and field conditions have been factored in, variety selection largely revolves around heat units available, points out Andrew.

"Whatever the variety, a grain to stover ratio of at least 50:50 is desirable and this should be combined with good standing power to support the cobs as they mature. KWS Anastasio is a great choice for grain maize due to its high grain yield and excellent standing power. If you're in an area with a higher number of heat units available, then KWS Papageno would be a sound choice too.

"While KWS Exelon would be a good option for slightly more marginal areas, ultra-early varieties with FAO ratings of 150-160 aren't recommended for grain due to the risk of brackling, where plants break below the cob as they mature," he says.

"You can select the best varieties with the correct FAO based on the average heat units for your location and get an idea of the predicted harvest date by using online tools."

According to KWS' Thomas Turner, while modern hybrids have a high degree of cold tolerance, they shouldn't be drilled before soils have reached an even temperature to give the best possible establishment.

"This is 8°C for light soils and 12°C for heavy soils for 3-4 consecutive days.

If you drill earlier, you're likely to have poor



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germination, uneven emergence and reduced nutrient uptake germination, while drilling too late could delay harvesting, risk poor maturity and increase lodging risk.

"Optimum drilling depth depends on time of planting with this being 3-5cm for crops drilled April to early May, 5-7cm from early May onwards and 7-9cm from mid-May onwards," he says.

## Secure rooting

Sowing at the right depth will allow buttress roots to develop and anchor crops securely, which is important when harvesting later, and a plant population of 85,000 plants/ha is ideal for dried grain maize with crimped grain maize slightly higher at 90,000 plants/ha, says Thomas.

"Row widths of 75cm are the most popular for grain maize as these work well with most maize combine headers at harvest, but 50cm is an option too — check this before you drill.

"Nitrogen applications once the crop is growing aren't usually necessary, particularly if full use of organic sources has been made. The crop is unlikely to require much in the way of agronomic interventions unless you're in area where maize eyespot occurs."

According to Howard, yield responses to starter fertiliser can be variable although it will increase the speed of establishment and earlier tasselling and maturity.

"Heavier, colder soils, particularly those without a history of FYM, will show the largest responses. Foliar polymer ureas which slowly release nitrogen over a six-week period can be particularly useful for those fields that may run short of nitrogen by tasselling. Uptake is only via the leaf so a good canopy is required for optimum results.

"Maize requires relatively high levels of potash – it helps to maintain the water content within the plant and the turgor of the

cells, and is important for the plants' natural ability to maintain stem stiffness and utilise nitrogen efficiently."

As for SFI, Thomas says there are several options complementary to maize production under the scheme.

"For example, if you're planning on undersowing maize crops under IPM3, you'll be eligible for £55/ha plus SAM2 offers £129/ha for growing an over winter multi-species cover to protect soil nutrient losses.

"Using integrated pest management (IPM4) on a whole field parcel of land to reduce insecticide use attracts payments too, but any specific advice on this should be sought from your agronomist," he says.

Frontier's head of grain (digital and procurement) Richard Johnston explains that the market for UK produced grain maize has been largely 'de-risked' in recent years with confidence growing and a steady demand for the crop now in evidence. ►



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James Faulkner began growing grain maize a few years ago after a positive experience producing forage maize as a feedstock for a local AD plant.

► “During the past few years, the UK has imported 1.5-2.2M tonnes of grain maize for a variety of end uses, so any market where that’s the case has significant potential for the domestically produced crop to grow and replace imports on a tonne for tonne basis.

“While in the past anybody considering growing maize for grain would be encouraged to make sure they had a contract before even considering planting the crop, demand is now sufficiently stable that it’s as reliable an option as wheat or barley, in marketing terms,” he says.

“As the largest global crop, grain maize, or corn as it’s known in many markets, often dictates grain commodity prices so UK wheat and grain maize tend to be priced similarly. During the past three years, prices have been very strong and although they’ve dipped a little recently, so too have those for other commodities.”

Richard says the domestic crop goes mainly for livestock feed with regional contracts, such as the one Frontier has set up with feed producer GLW Feeds — an

example of how the market is developing.

“We’ve worked hard to develop a market for UK-produced grain maize and are now able to offer forward prices, which is another marker of how much things have moved forward in recent years. You can drill a crop now and fix a price for say, December, so you have the same level of security as you would with any combinable crop.”

Maize has proved to be a perfect rotational fit on the 1350ha arable farm managed by James Faulkner near Colchester in Essex. Not only does it provide a useful break from cereals, it also generates significant income from forage sales to a nearby AD plant as well as grain maize sold for livestock feed manufacture, he says.

“We began growing grain maize a few years ago after a positive experience producing forage maize as a feedstock for a local AD plant. We currently grow 200ha for grain and 1000ha for forage, with another 700ha harvested for other growers.

## Soil type considerations

“The maize is grown on land that you wouldn’t usually consider suitable for cropping, but the low average rainfall of just 500mm in the region means we can grow it on soils that might be considered too heavy in other parts of the country. The farmland runs down to the sea and the majority is a very heavy London clay with the remainder Hanslope, which has a calcareous, chalky texture.

“Ironically, we tried growing maize on the lighter land and rye on the heavier soils, but in fact performance was improved when the reverse policy was introduced,” explains James.

Advised by Frontier agronomist, Marcus Mann, the maize has always performed well and the cereal crops that follow are always impressive, he says.

“It’s probably due to the amount of potash left in the soil and the maize has really



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helped clear up our grassweed issues, especially blackgrass and ryegrass. I’m sure the deep-rooting effect of the maize has improved the soil profile, too,” comments James.

He says KWS Anastasio and Keops have been the standout varieties in recent years with both used for grain and forage.

“We chose KWS Anastasio for the first time in 2021 because of its high yield potential and it’s more than met our expectations and demonstrated the flexibility we were hoping for.

“We’ve seen fresh weight yields as high as 53t/ha and produced up to 11t/ha of dry grain. It’s a true multi-purpose variety with tremendous yields and an early harvest date which allows time to plant the following wheat,” says James.

Equally, KWS Keops has impressed. “Production is very similar to KWS Anastasio and we’ve combined it for grain, but its real strength is as a forage variety with average fresh weight yields 54-55t/ha seen.”

The standard policy is to sow maize from 15 April to 10 May and to harvest the crop in early September. James believes that some growers might be wary of the late harvest associated with the crop, but because of grassweed issues, he doesn’t drill the following wheat crop until the middle of October.

“Because we’re combining you can run on the crop trash and keep trailers out of the field so you aren’t churning the soil up. If it gets too late, we can simply put in another crop of maize in the following spring which works well.

“The margins are good and given that the UK imports around 2M tonnes of maize a year, demand is strong and can only get higher,” concludes James. ■



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