



Farmer/Grower Guide for Undersowing Maize – Where, When, What and How

This decision support guide for undersowing maize aims to assist maize growers through giving guidance for decision making on undersowing maize, to protect soil & water whilst minimising risk to maize yield.

Successful maize undersowing will depend on soil conditions, establishment timing and weather (particularly soil moisture and sunshine levels).

The information included has been developed from an extensive range of research reports, Maize Growers' Association and industry technical guidance, as well as responses to a national farmer/agronomist questionnaire.

Engagement with seed suppliers/advisers and agronomists is recommended, to determine suitable seed rates and costs, ensure compatible mixtures and discuss rotational considerations for specific circumstances.

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Section One – Introduction to Maize Undersowing Agronomy

Summary of Key Agronomic Points

Benefits	❖ Reduced nutrient losses ❖ Reduced run-off and erosion ❖ Improved soil structure & improved soil trafficability at harvest ❖ Additional forage ❖ Suppress broad-leaved weeds ❖ Increased soil organic matter/carbon
Suitability	❖ Undersowing works best in warmer, more reliable maize-growing areas ❖ High risk of failure if your fields/soil usually get very dry in July ❖ Best germination of the companion species will require good seed-soil contact and moisture ❖ 75 cm maize row spacing to allow 20 cm minimum gap between maize row and companion
Establishment	❖ A minimum of 14 days should be left after post-emergence herbicide applications before sowing the understorey (the companion species sown under the maize canopy) ❖ Sowing when maize is 4-6 leaves (by early June) works well with slower developing companion species such as clovers and tall fescue ❖ Sowing when maize is 6-8 leaves or approximately knee height (from mid-June) works well for more competitive, fast-growing species such as Westerwolds (annual ryegrass), and Italian ryegrass ❖ Shallow drilling (1-1.5 cm) into moisture, at 4-6 maize leaves, particularly with pressing rollers, will achieve a better seed-soil contact for good germination ❖ If maize plants are more developed (8-10 maize leaves), broadcasting followed by harrowing does less damage, and the maize is less likely to be impacted by competition of the understorey. Equipment for broadcasting is usually easier to access/cheaper to acquire; however, it tends to be less successful in dry conditions. ❖ When maize plants are beyond approximately 10+ leaves (>50 cm height), understorey/companion species establishment will be limited by availability of sunlight (as the maize canopy starts to meet between rows) and moisture (depending on weather conditions)
Species choice	❖ Grasses, specifically Westerwolds and Italian ryegrass, have been the most popular and most reliable species group to establish under maize. They typically show good growth after maize harvest and into the following spring and can be used for grazing or cutting. Tall fescue is less competitive, so can be sown earlier to minimise maize plant mechanical damage and competition ❖ Legumes, white clover, crimson clover and red clover, have been successful; shallow sowing (1 cm) or broadcasting into warm, moist soil is critical for good germination ❖ Legumes will work best in soils with lower residual soil nitrogen and will generally start to fix nitrogen via active rhizobia in root nodules by 4-6 weeks post germination (in warm, moist soils). Small amounts of nitrogen can be released through root exudates and natural root dieback/turnover from 8-14 weeks ❖ Deep rooting herbs, chicory and ribwort plantain, along with red and white clover and Festulolium, can establish well and grow good forage, with growth accelerating post maize harvest to provide a good autumn bite and excellent spring forage ❖ Brassicas, such as fodder radish, can establish well but may compete more with maize plants for nutrients

Section Two – Undersowing Maize Decision Steps

1. Field Risk Assessment - Is the field prone to soil erosion, runoff or nutrient leaching? Indicators: sandy/gravelly soils, sloping fields, sensitive catchments, history of runoff.

Yes → HIGH RISK → Strongly consider undersowing to reduce runoff, prevent nitrate leaching, retain soil, and avoid bare overwinter stubbles

No → LOW/MODERATE RISK → Strongly consider undersowing to prevent nitrate leaching and avoid exposed soil overwinter

2. Machinery & Practical Capacity - Do you have access to a specialist inter-row undersowing drill? - Inter-row drills give best establishment and minimise competition.

Yes → Ideally shallow inter-row drill at 4–8 maize leaf stage, with coulter rollers/harrows

No → Consider broadcasting followed with harrowing but expect lower establishment

3. Herbicide Programme Compatibility - Has the last herbicide application been applied >2 weeks ago?

Yes → Safe to proceed

No → Delay undersowing to avoid damage to the understorey

4. Crop Stage & Timing –

4a. Maize growth stage at sowing

- Before 4-leaf stage → Avoid – risk of herbicide effects and competition/maize yield impact
- 4–6 leaf stage (25–30 cm) → Best timing for inter-row drilling; large UK trials show strong establishment. → Suitable for undersowing with less competitive grasses: tall fescue, creeping red fescue or grass/clover mixes
- 6–8 leaf stage → Allows use of more competitive grasses (e.g., Westerwolds, Italian ryegrass) and grass/legume/herb mixes
- After canopy closes → likely too late for funded scheme eligibility (check with scheme details); establishment of understorey likely to be poor and damage to maize plants more likely

4b. Is soil moisture adequate?

- Adequate for good germination or rain due imminently → Proceed
- Low moisture, rain not due → understorey establishment may fail; consider delaying or choosing more drought-tolerant species e.g. fescues
- A well-established understorey can help reduce moisture loss through the season

4c. Is avoiding maize yield impacts a priority?

Inter-row drilling at 4–6 leaf and modest seed rates (e.g. 10–15 kg/ha) to limit competition. Speak to seed supplier in relation to specific undersow species seed rates.

Some species have more impact on yield potential than others, depending on seasonal circumstances. Make use of available, local guidance from reliable sources in confirming companion species compatibility.

5. Undersowing/companion species selection – see Species Selection Matrix

Shortlist suitable species for:

- soil type
- environmental focus (nutrient capture vs soil erosion/compaction protection)
- following crop
- post-harvest grazing requirements/potential risk such as poaching and surface run-off

In addition, bi-cropping maize with climbing beans, whether between or within the rows, can provide a higher protein silage successfully

Brassicas (including stubble turnips) tend to scavenge nitrogen so impact on maize yields can depend on soil fertility, timing, sunshine and moisture levels (as it can with other understorey species).

6. Understorey Establishment Method

If optimal conditions (i.e. a drill is available, 4–8 leaf stage): → Use inter-row drill 10–20 cm from maize rows (depending on maize vigour/competition risk).

If less than optimal conditions (less rainfall, cooler springs): → Use inter-row drill min 20 cm from maize rows to minimise competition risk. (Best establishment + minimal competition)

If broadcast is the only option: → Broadcast + light harrow to ensure seed-soil contact. Expect lower establishment of understorey.

7. Post Harvest Management –

a. Has the understorey established well?

Yes → No further action; use for autumn grazing, over-winter soil protection, early spring grazing, early spring silage cut. Reduces nitrate leaching (up to 61%)

No → Reseed within 2 weeks of maize harvest by drill or broadcasting, followed by rolling for good seed-soil contact and to aid maize stubble destruction (also helpful for reducing corn-borer survival)



b. Understorey destruction method

Where understorey has become quite dense, destruction 6-8 weeks pre-drilling will allow for residue decomposition prior to seedbed creation.

Do you have access to grazing livestock?

Yes → Graze to remove biomass while depositing nutrients prior to cultivation, cultivate trigger weed germination for a stale seedbed if needed, cultivate to incorporate residues

No → Flail/mow/top understorey canopy prior to cultivation (also helps limit corn borer survival) allows slow release of nitrogen

or → Herbicide (6-8 weeks pre-drilling) – reliable if mechanical methods insufficient

or → Use frost sensitive understorey species that will die off over winter

c. Cultivation type

Shallow cultivation may be sufficient when plant residues are light or when using a stale seedbed approach to maintain soil organic matter.

Deep cultivation/ploughing may be needed where more vigorous grasses were used and/or when following with a cereal.

Species Selection Matrix

✓ = compatible ○ = dependent on additional factors △ = limited

	Fescues (creeping red/tall)	Festuloliums (ryegrass× fescue)	Westerwolds	Italian Ryegrass	Perennial Ryegrass	White Clover	Red Clover	Annual Legumes	Clover– Grass Mixtures	Chicory + Ribwort Plantain
Nutrient Capture	✓ Reduces nitrate loss.	✓ Great for N scavenging; strong biomass	✓ Quick cover reduces winter leaching	✓ Effective catch crop monitor competition	✓ Reliable	✓ High N-fixation; reduces fertiliser need	✓ Deeprooting- & N-cycling beneficial	✓ Strong early N fixation in some species	✓ Excellent (industry standard for soil protection)	✓ Herb mixes scavenge N (~40 kg/ha)
Compacted / High Run-off Risk	✓ Good ground cover; reduces erosion	✓ Excellent root mass; improves soil structure	○ Good early cover; variable under shade	○ Fast root mass; dependent on soil conditions	○ Works if drilled	△ Does not thrive in compact soil	△ Does not thrive in compact soil	△ Best only where compaction is moderate. Help improve structure	✓ Very strong; diverse rooting improves infiltration	✓ Deep rooting increases infiltration; great for soil biology
Light / Sandy / Gravelly	✓ Low competition; drought-tolerant	✓ Strong rooting; good drought tolerance	○ Fast-grower but moisture hungry; risk in drought	△ Moisture dependent; weaker in drought	○ Reliable but slows in dry soils	○ Works but slower early growth	○ Performs ok; may struggle in drought	△ Fast cover but drought limits. Vetches slow in dry conditions	✓ Very good; mix stabilises moisture bottlenecks	✓ Excellent in dry conditions (once established), due to deep tap roots
Loam / Medium Soil	✓ Good all-rounder	✓ Strong yields; performed well in NIAB trials	✓ Rapid early cover	✓ Strong establishment	✓ Excellent generalist	✓ Great for N cycling; robust	✓ Works well; provides deep rooting	✓ Strong on loams; fast N fixation	✓ Very strong; balances rooting + N supply	✓ Very suitable; ensure 20cm distance from maize minimum
Clay / Heavy Soil	○ Slower in wet soils	✓ Handles heavier soils better than ryegrasses; deep rooting	△ May suffer in waterlogging	△ Suffers in waterlogged soils	○ Moderate performance	△ Slow start in wet clays	△ Red clover dislikes waterlogging	△ sensitive to waterlogging	○ Works if grass-heavy mix; legumes have slow early growth	△ Avoid if waterlogged; prefers good drainage

Section Three - Maize Undersowing Detailed Guidance

1. How can undersowing provide benefits?

- a. Take regional climate into account
 - i. High rainfall areas have high risk of nutrient run-off and leaching into watercourses and groundwater as well as high risk of soil loss through erosion (undersowing maize is particularly valuable in these conditions)
 - ii. High rainfall, highly fertile soils have increased competition risk and a risk of the understory outcompeting maize.
 - iii. High risk of understorey failure in low rainfall areas if fields/soils usually get very dry in July
- b. Carbon capture & soil health: increasing soil biological activity, organic matter and nutrient cycling
 - i. Undersowing maize with grasses or mixed species increases total root biomass and improves soil carbon inputs, i.e. mixes containing Festulolium, red clover, chicory and plantain can produce ~4 t DM/ha additional forage dry matter with higher carbon returns to the soil.
 - ii. Mixed rooting systems increase the diversity of root exudates, supporting soil microbial biomass and improved nutrient cycling.
- c. Soil & water protection: increase water infiltration, reduce soil erosion, reduce compaction & reduce nutrient loss (N&P), scavenge free nitrate
 - i. Grasses reduce erosion risk by covering soil through the maize canopy phase. Ryegrasses consistently reduce surface runoff and protect soil.
 - ii. Significant improvements in water infiltration and reductions in soil loss compared with maize alone.
 - iii. Brassicas (turnips, radish) enhance infiltration and reduce shallow compaction using strong taproots and scavenge nutrients.
 - iv. Undersowing maize with grass can reduce nitrogen leaching by up to 61% or 17-82kg/ha.
- d. Improved trafficability at harvest with roots supporting soil structure under machinery
 - i. Deep rooting species, such as red clover, chicory and ribwort plantain, improve soil structure and machine bearing capacity in wet harvest conditions.
 - ii. Grasses help to bind soil during wet autumns, reducing rutting.
- e. Additional forage: winter grazing, spring grazing, bi-crop silage
 - i. Red clover–chicory–plantain undersowing yielded 19.46 t DM/ha total forage, with maize yield unaffected, providing high-quality forage after maize.
 - ii. Italian ryegrass undersowing on UK farms has generated 1,500 ewe grazing days/ha post-harvest.
 - iii. Grazing brassicas (turnip, forage rape, radish) offer high-quality winter feed, although turnips yield best when drilled July–August.
- f. Crop rotation
 - i. Legumes (clover, beans) fix N, reducing fertiliser requirements in the following crop and improving soil N supply.
 - ii. Brassicas break pest/disease cycles and contribute bio-fumigant glucosinolate compounds.



- g. Weed suppression
 - i. Ryegrasses and brassicas suppress weeds effectively; multi-species mixtures are good at out-competing weed species.
 - ii. Brassicas (turnip, radish) provide natural herbicidal glucosinolates reducing weed germination.
- h. Increased biodiversity through increased food and shelter sources for invertebrates, birds and small mammals.
 - i. Undersown mixtures support greater invertebrate populations than bare maize soil, improving ecological function and game chick survival.
- i. Yield impacts are context-dependent with most trial data showing no negative impact. Correct establishment of both maize and understorey eliminates most potential yield risk. Species choice, timing, and herbicides are critical.

2. When to do it?

- a. Effect of maize maturity range & varieties (early vigour)
 - i. Early-maturing hybrids are harvested earlier and allow more autumn growth of the understorey.
 - ii. Vigorous, tall maize varieties reduce light to understorey; open-canopy types improve establishment.
- b. Maize growth stage and timing of undersowing
 - i. Growth stage V4–V8 (4-8 leaves) is the most successful drilling window: maize is established enough to compete, herbicides have been applied, and canopy still lets in light.
- c. Herbicide timing
 - i. Post-emergence herbicides severely restrict species choice; clovers (and other legumes and herbs) can be sensitive to sulfonylureas, dicamba, and mesotrione residues. Leave a minimum of two weeks post herbicide application before sowing the understorey. (Always follow product instructions).

3. What species types (grasses, legumes, herbs, brassicas) and which species/mixtures to use (**see matrix**)

- a. Grasses – scavenge N – consider rotation impact
 - i. Strongest soil protection and quickest canopy fill.
 - ii. Westerwolds (annual ryegrass) and Italian ryegrass are consistently the most successful undersown species in UK trials.
 - iii. Excellent N scavenging; ryegrasses reduce nitrate leaching substantially.
 - iv. Rotation impact: can cause volunteers in following cereals.
- b. Legumes – fixing N – consider rotation impact
 - i. Fix atmospheric N, improving soil fertility. Legumes will work best in soils with lower residual soil nitrogen and will generally start to fix nitrogen via active rhizobia in root nodules from 4-6 weeks (in warm, moist soils) post germination. Small amounts of nitrogen can be released through root exudates and natural root dieback/turnover from 8-14 weeks, depending on species.
 - ii. Festulolium, red clover, chicory, ribwort plantain mix increased total forage dry matter by ~4 t/ha.



- iii. Bi-cropping climbing beans with maize can increase crude protein in silage and improve maize digestibility.
 - iv. Field beans: deep rooting and N-fixing but may suppress maize if sown too early.
 - v. Herbs - Deep rooting herbs such as chicory and ribwort plantain improve soil structure, drought resilience, and grazing value. Contribute significantly to forage quality, particularly when mixed with red clover.
 - vi. Brassicas – less viable
 - 1. Rapid establishment; strong compaction relief (radish) and grazing value (turnips).
 - 2. Very effective nutrient scavengers so compete with maize for nutrients, low seed rates needed.
 - 3. Rotation impact: risk of clubroot; avoid high brassica frequency.
 - 4. Reduces trafficability at harvest – uneven surface
- c. Mixtures
- i. NIAB trials: red clover + chicory + plantain best overall balance of weed suppression, yield, and soil health.
 - ii. Grass/clover mixes give reliable establishment under UK conditions.

4. How to establish

- a. Maize row spacing
 - i. 75cm row width (rather than 50cm) in the maize crop will best allow understorey development, with less shading and minimal competition to the maize as the undersown companion develops.
 - ii. Leave minimum gap of 10-20 cm between understorey and maize row to minimise competition, depending on maize vigour and competition risk.
 - iii. Speed of establishment will be limited by the availability of sunlight and moisture. Earlier understorey/companion establishment will ensure successful plant development; later establishment will favour the maize and minimise competition, and the companion understorey may take longer to get going after maize harvest depending on conditions.
- b. Inter-row drilling with rollers (seed rates, row spacing, depth, timing)
 - i. Press wheels behind the coulters will provide best soil-seed contact to maximise germination.
- c. Broadcasting (seed rates, timing)
 - i. Works if rainfall follows. Early broadcasting can be unreliable, with reduced seed-soil contact.
 - ii. Best when harrowed over in moist soil or when rainfall imminent, as moisture is critical.
 - iii. Particularly suited to small-seed species such as clovers and herbs.
- d. Drone (seed rates, timing)
 - i. Emerging technique; allows late-season seeding where machinery cannot pass tall maize.
 - ii. Reliant on moisture, as there is typically minimal seed-soil contact.



5. How to manage

- a. Germination and growth
 - i. Species selection critical - shallow-rooted species suffer most under dry July conditions
- b. Persistence
 - i. White clover and plantain can persist into following season; grasses often winterkill depending on variety.
- c. Agronomy practices – avoid excess N to understorey in early development, slurry can risk scorching
 - i. Avoid high N early: oversupplying N accelerates grass competition with maize.
 - ii. Slurry applications risk scorching; apply post-emergence of the undersown crop only under cool, moist conditions.
- d. Grazing management
 - i. Light autumn grazing of the understorey will encourage tillering and spread across rows of understorey. Maintain significant soil cover by avoiding grazing hard in the wetter months from after maize harvest to early spring to avoid poaching (surface compaction) and run-off.
- e. Destruction, incorporation and decomposition
 - i. The remaining understorey can be left as a green manure until preparation for the following crop, at which stage the area can be topped and incorporated, leaving a stale seedbed with any regrowth. Volunteers or other weed species are be mechanically controlled or sprayed off.
 - ii. Grazing with livestock will remove biomass while depositing nutrients prior to cultivation.
 - iii. Where understorey has become quite dense, destruction 6-8 weeks pre-drilling will allow for residue decomposition prior to seedbed creation.
 - iv. Flail/mow/top understorey and incorporate to improve nitrogen mineralisation. This also helps limit corn borer survival. As the understorey roots break down, they will release nitrogen and increase soil organic matter, supporting nutrient cycling in following crop.
 - v. Brassica roots break down rapidly after frost.
 - vi. Shallow cultivation may be sufficient in the autumn or when plant residues are light or when using a stale seedbed approach to maintain soil organic matter.
 - vii. Deep cultivation/ploughing may be needed where more vigorous grasses were used, when following with a cereal, or when cultivating in the spring.
 - viii. Glyphosate (6-8 weeks pre-drilling)– reliable if mechanical methods insufficient, but can impact soil biology.



Appendix - Grower Survey Findings – December 2025

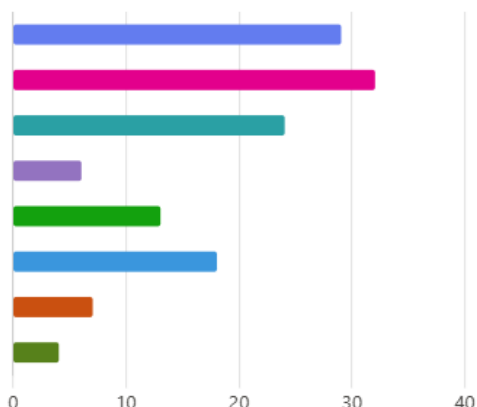
Survey responders were farmers/growers, agronomists and contractors (n = 51) across England covering approx. 16,000ha of both forage and AD maize cropping and some grain maize. Two thirds grow maize in rotation, one third continuous maize. The area of maize they undersow ranges from 10ha to 1200ha/yr with most between 60 and 250ha/yr.

- 27% of respondents said, in their experience, undersowing maize works well
- 40% had mixed results
- 12% said it didn't work but they will try again
- 18% haven't yet tried
- 30% intend to increase the area of undersown maize grown
- 25% intend to undersow the same amount again
- 7% intend to sow less due to uncertainty over scheme funding, and when weed control or establishment have been difficult.
- 4 respondents saw maize yield impacts but these were mainly due to the dry season in 2025 with no specific/accurately quantified amount.
- 56% made use of the SFI action funding.
- 40% get their advice from MGA.
- 34% get their advice from their agronomist or technical industry people.
- 12% get their advice from other farmers.
- 10% get their advice from their own experience, and 10% from online information including research results.
- 38% would like to join an undersown maize grower group

Additional information growers would find useful

22. What additional information/guidance on undersowing maize would be beneficial to you or others? (tick all that apply)

Species selection for specific uses	29
Establishment methods, timings and considerations	32
Agronomy and how to get the best out of each species	24
Harvest considerations/timings	6
Destruction methods	13
A decision tree/support tool to aid species selection, establishment and management...	18
None	7
Other	4

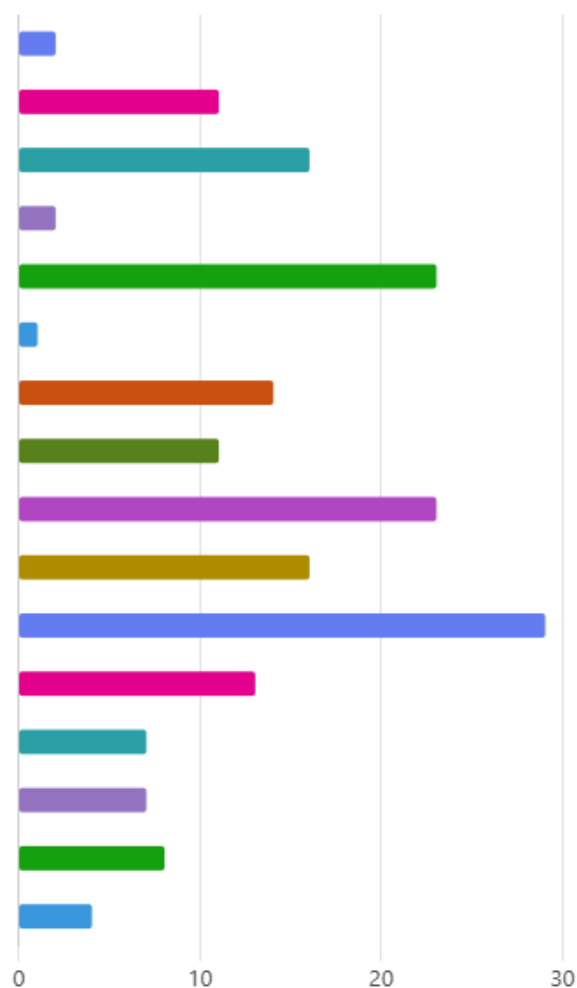


Decision tool guidance encompasses species selection, establishment, harvest considerations and destruction so covers 93% of these responses.

Observed benefits

14. Which, if any, benefits from undersowing have you seen? (tick all that apply)

● Less nitrogen needed for the maize crop	2
● Weed suppression in the maize	11
● Less nitrogen loss/leaching	16
● Higher protein/bi-crop forage	2
● No impact on maize yield	23
● Maize grew better	1
● Additional grazing	14
● Increased total forage production per hectare	11
● Soil more trafficable at maize harvest	23
● Less soil compaction at harvest	16
● Less soil erosion/loss	29
● Soil more friable/workable for next crop	13
● More soil nitrogen available for the following crop	7
● Good performance in following crop	7
● Longer term soil health benefits (please specify in Q18)	8
● Other	4

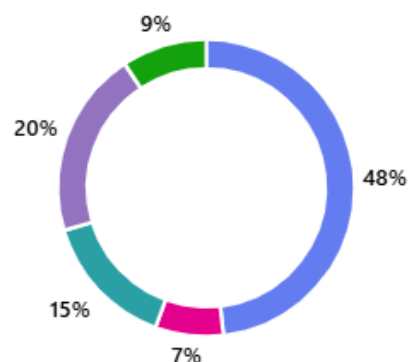


Establishment method

10. How was the understorey/companion established? (tick all that apply)

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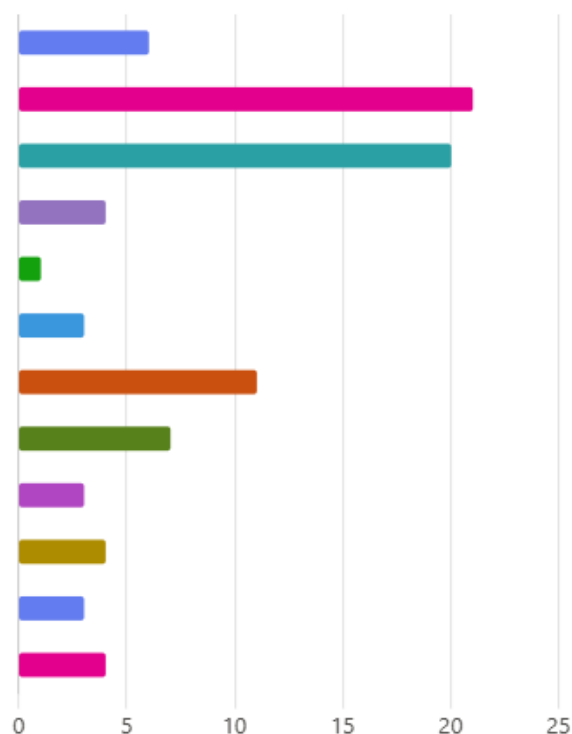
● Sown in strips between maize rows with specialist/adapted drill	26
● Drilled the maize into an established cover (please say what species the cover included below)	4
● Broadcast into the maize crop	8
● Done by contractor	11
● Other	5



Species sown in understorey

8. Which companion species have you undersown maize with? (tick all that apply and please add detail on mixtures used and additional species in the following question)

● Perennial ryegrass	6
● Annual ryegrass (Westerwolds)	21
● Italian ryegrass	20
● Festuloliums	4
● Other grasses (please specify in next question below)	1
● Climbing beans	3
● White clover	11
● Red clover	7
● Other legumes (please specify in next question below)	3
● Herbs (i.e. plantain, chicory - please specify in next question below)	4
● Brassicas (please specify in next question below)	3
● Species mixture (please specify in next question below)	4

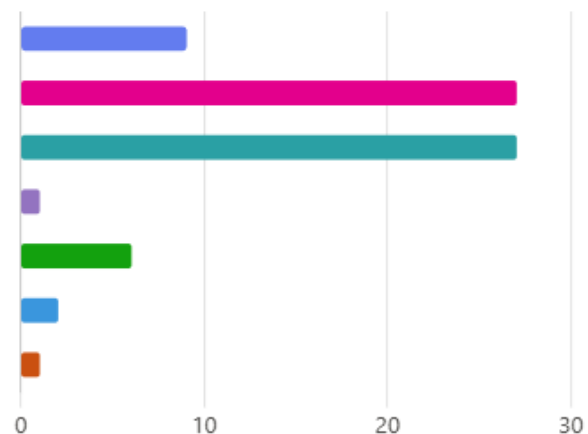


Additional species not in this list were mainly Westerwolds (annual ryegrass), mustard, plantain and chicory and vetches

Weed control

12. What, if any, weed control approach have you used? (tick all that apply)

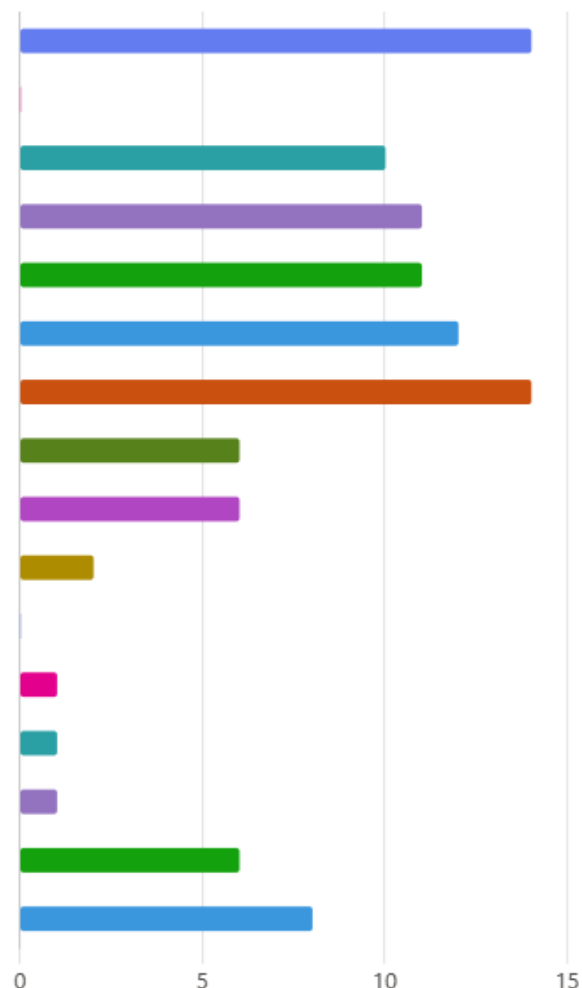
● Stale seedbed	9
● Pre-emergence herbicide at maize drilling	27
● Post-emergence herbicide prior to sowing companion	27
● No herbicides applied	1
● Mechanical/inter-row weed control prior to sowing companion	6
● No weed control	2
● Other	1



Challenges growers have had

15. What challenges have you had with undersown maize? (tick all that apply)

● Cost of seed to undersow with	14
● Difficulty getting hold of the seed to undersow with	0
● Difficulty accessing suitable equipment to establish	10
● Difficulty finding available contractor to establish understorey	11
● Difficulty establishing the companion without damaging the maize	11
● Difficulty establishing understorey after use of pre/post em herbicides	12
● Poor companion/undersowing establishment	14
● Weed control	6
● Reduction in maize growth/yield	6
● Companion swamped out the maize	2
● Difficulty finding available contractor for harvest	0
● Difficulty getting maize harvested at the right time due to weather conditions (drie...	1
● Difficulty at maize harvest - due to the companion	1
● Difficulty destroying companion/cover crop	1
● None	6
● Other	8



Free Text Comments Covering Grower Experiences and Advice

- Undersowing normally must be done at the 4–6 leaf stage, and wet weather or rapid maize growth can make that window very narrow
- Low moisture can slow grass growth; wet conditions can also hinder drilling operations
- Some mixes establish slower and more variably than ryegrass
- More vigorous understories can reduce first-year maize yields, depending on species choice and density. Trials found some vigorous understories reduced yield by 0.725 t DM/ha in year one
- Specialist inter-row drills are not always locally available and increase costs. Specialist drill hire costs ~£30/ha
- Broadcasting seed often gives poor establishment under a maize canopy
- Compacted ground and run-off issues can still occur if soil structure or field choice is poor.
- UK weather volatility (drought–rainfall swings) can hinder grass/clover establishment under maize canopies
- If grass fails or is patchy, farmers must (under some schemes) re-establish a cover crop within two weeks of maize harvest, at their own cost
- Late canopy closure reduces light available for the understory.
- Heavy maize crops may shade out slower-growing species
- Undersowing is most beneficial on sandy/gravelly soils or steep fields with high winter run-off
- Compacted soils still require mitigation even when undersown
- Compliance with soil protection requirements
- Reduced cultivation in Autumn
- Some maize damage at grass establishment
- In a dry spring, less moisture for maize establishment can reduce yields by 1-2 t /ac
- No impact on yield
- There doesn't seem to be any yield impact
- Possible loss of maize yield after forage rye due to ground having been dried out by the companion and subsequently not re-wetted for some time (spring 2025)
- Previous Grass understorey made drilling conditions better
- Continuous maize/cover crop fields were affected. Assessment was done by eye, 50% of field area was affected in patches. yield assessment was made in the clamp at 40% reduction due to previous under-sown grass using spring moisture before a dry maize growing season
- Drilling into the soil is essential for establishment (as opposed to putting the see on top)-ideally followed by rainfall
- Do so if the following crop after the maize will be grass, but try and go early with the drilling
- Worth trying on lighter sands
- Know and understand your weed spectrum
- Plan it out properly and check equipment is all working correctly



- There is plenty of flexibility when it comes to undersowing and high levels of success can be achieved
- Try it
- Success is weather dependant
- sow as soon as you can after spraying
- Be aware in low rainfall areas
- Use a drone! Theres no crop damage and it costs about the same as a tractor doing it.
- Give it a go
- If done when the maize is not too tall much of it recovers after having been knocked down on the headlands
- Be careful of interrow drill going across banks - it tends to track lower down the bank than the tractor
- If field is being left until Spring for cropping then understorey should add resilience
- phase the introduction to see if it works on the soil type and farming system

Growers' Suggested Research Topics

- Herbicide use prior to undersowing
- Establishment method success for different understoreys
- Evidence of benefits in a range of regions and situations
- Assessment of run-off reduction
- Trials with different species undersown
- Long term rotation benefits in crop yield and soil health
- Optimum species, sowing rates for different situations
- Undersowing climbing beans for improved animal output
- Fully costed the benefits and drawbacks as well as risks in a "guide to undersowing" maize. dos/don'ts
- Slurry Seeding and varieties involved