

With the introduction of the three crop rule, many farmers have opted to introduce a spring cereal into the rotation. Many broad-leaved weeds have the ability to germinate and grow rapidly in the spring:

Competitiveness of SPRING germinating weeds	Threshold (plants/m ²) for 5% yield reduction in winter wheat
Cleavers	Less than 1
Charlock, mayweed, volunteer oilseed rape and poppy	Up to 20
Black bindweed, chickweed, fat hen, forget-me-not and redshank	20-49
Cranesbill, fools parsley, fumitory , groundsel, knotgrass , red dead-nettle, scarlet pimpernel, sow thistles, speedwell	50-99
Field pansy, parsley piert, venus looking glass	Over 100

Source: Adapted from HGCA *Managed weeds in an arable rotation guide*. **Bold** - driver weeds for spring cereals



High weed populations compete with the crop especially for water as soils become drier. This topic sheet discusses using Spitfire for broad-leaved weed control in **spring barley, spring wheat** and **spring oats**.

Active Ingredient:	100 g/litre fluroxypyr + 5 g/litre florasulam
Formulation:	Suspension Emulsion
Maximum Individual Dose:	1.0 L/ha in the spring
Application Timing:	From GS 13 to GS 39 in spring barley and wheat }including those undersown From GS 13 to GS 31 in spring oats }with grass
LERAP:	B

Spitfire Application Advice:	Tank Mix Options:	Following Crops:
<ul style="list-style-type: none"> Apply when weeds are at the 2-4 leaf stage, typically early to mid-tillering of the crop Use CFF, VPF, Pre-orifice, Air-inclusion or Twin-fluid nozzles MEDIUM spray quality Water volume 80 – 300 litres water/ha (N.B. 80 L/ha provided adequate target coverage possible) 	<ul style="list-style-type: none"> Spitfire 0.75 L/ha + mecoprop-P 1.0-1.25 L/ha <ul style="list-style-type: none"> Brassicas, chickweed, cleavers, fat hen, fumitory, hemp-nettle, mayweeds, orache, penny cress, polygonums, poppy Spitfire 0.75 L/ha + HBN 0.75-1.0 L/ha <ul style="list-style-type: none"> Brassicas, chickweed, cleavers, dead-nettles, fat hen, fumitory, hemp-nettle, mayweeds, polygonums, poppy, speedwells Spitfire 0.75 L/ha + dicamba + mecoprop-P 84+600 g ai/ha - 105+750 g ai/ha <ul style="list-style-type: none"> Brassicas, chickweed, cleavers, fat hen, fumitory, hemp-nettle, mayweeds, orache, penny cress, polygonums, poppy Spitfire is <ul style="list-style-type: none"> Compatible with many herbicides (including other ALS - herbicides), fungicides and growth regulators Find tank mixes on Product Finder APP 	<p>In the same year of treatment with Spitfire can autumn sow (with no specific cultivation requirements):</p> <ul style="list-style-type: none"> Cereals OSR Field beans Vegetable brassicas as transplants Grass

NEW Product Finder App - find product solutions for your spring cereal crops. See uk.dowagro.com/ for details.

Resistance Management

Broad-leaved Weed Resistance:

- Resistance in broad-leaved weeds to ALS - herbicides is Target Site resistance
- Present in mayweeds, chickweed and poppy in the UK; corn marigold in Ireland
- Confirmed mutations are:
 - Proline₁₉₇ mutation
 - Confers resistance to the SUs and moderate or no resistance to the triazolopyrimidines (florasulam)
 - Tryptophan₅₇₄ mutation
 - Confers resistance to both the SUs and triazolopyrimidines in a number of broad-leaved weed species

Solutions:

- Avoid the over reliance on SU chemistry across the rotation- use mixture products
- Use alternative MOA's where possible
 - Chickweed – fluroxypyr e.g. Spitfire
 - Mayweeds – clopyralid e.g. Galaxy
 - Poppy – florasulam (Proline₁₉₇ resistance)

Weed Spectrum

Weed	Spitfire 0.75 L/ha	Spitfire 1.0 L/ha	Spitfire 0.75 L/ha + mecoprop-P 1-1.25 L/ha	Spitfire 0.75 L/ha + HBN 1.0 L/ha	Spitfire 0.75 L/ha + dicamba + mecoprop-P 1.0-1.25 L/ha
Black bindweed	4 etl	100 mm	✓	✓	✓
Black nightshade	4 etl	6 etl	✓	✓	✓
Bugloss	MS	4 etl	X	✓	MS
Charlock	6 etl	BFBV	✓	✓	✓
Chickweed	Flowering	Flowering	✓	✓	✓
Common field speedwell	T	T	MS	✓	MS
Corn marigold	4 etl	up to rosette	✓	✓	✓
Cleavers	200 mm	Flowering	✓	✓	✓
Clover	MS	100 mm	✓	✓	✓
Cornflower	S	S	✓	✓	✓
Corn spurrey	MS	2 etl	✓	✓	✓
Docks (from seed)	2 etl	4 etl	✓	X	✓
Fat hen	T	T	✓	✓	✓
Field penny-cress			✓	X	✓
Forget-me-not	50 mm	BFBV	✓	✓	✓
Fumitory (common)	T	MS	✓	✓	✓
Geranium spp.	T	MS	✓	X	✓
Groundsel	MS	50 mm	✓	✓	✓
Hedge mustard	4 etl	100 mm	✓	✓	✓
Hemp-nettle	4 etl	6 etl	✓	✓	✓
Henbit dead-nettle	MS	2 etl	MS	MS	✓
Ivy leaved speedwell	T	T	MS	✓	✓
Knotgrass	MS	3 etl	MS	✓	✓
Mayweeds	Rosette	Flowering	✓	✓	✓
Orache	T	T	✓	X	✓
Pale persicaria	MS	4 etl	✓	✓	MS
Pansy (field)	T	T	X	X	✓
Parsley piert		100 mm	MS	MS	✓
Poppy* (common field)	MS*	100 mm*	✓	✓	✓
Red dead-nettle	T	2 etl	MS	✓	✓
Redshank	MS	MS	X	✓	✓
Scarlet pimpernel	MS	MS	X	✓	X
Shepherd's needle	4 etl	6 etl	✓	✓	✓
Shepherd's purse	4 etl	100 mm	✓	✓	✓
Small nettle		MS	✓		✓
Sow thistle (annual)	MS	100 mm	✓	✓	✓
Sun spurge	4 etl	6 etl	✓	✓	✓
Volunteer beans	6 etl	8 etl	✓	✓	✓
Volunteer borage	4 etl	6 etl	✓	✓	✓
Volunteer linseed	MS	100 mm	MS	✓	✓
Volunteer oilseed rape	6 etl	BFBV	✓	✓	✓
Volunteer peas	6 etl	8 etl	✓		✓
Weed beet	4 etl	6 etl	✓	✓	✓
Wild radish	6 etl	100 mm	✓	✓	✓

Bold - Spitfire label weeds, S - Susceptible, MS - Moderately Susceptible, etl - established true leaves, BFBV - before flower buds visible, T - Tolerant, X - not controlled to acceptable level, there may be re-growth, ✓ - controlled up to 4-6 leaves, * - with an adjuvant (MSO adjuvant or Abacus, Arma, Bio Syl, Cogent, Kantor, Respond, Roller, Spryte Aqua, Tonto). Non-label weeds listed as an indication of the effect that would be expected to be achieved based on limited data.

Use plant protection products safely. Always read the label and product information before use. For further information including warning phrases and symbols refer to label. Dow AgroSciences Limited, CPC2 Capital Park, Fulbourn, Cambridge, CB21 5XE. Tel: +44 (0) 1462 457272. Technical Hotline: 0800 689 8899 UKHotline@dow.com | <http://uk.dowagro.com/> | ©TM Trademark of the Dow Chemical Company ("Dow") or an affiliated company of Dow. All other brand names are trademarks of other manufacturers for which proprietary rights may exist. Spitfire® contains fluroxypyr and florasulam.

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