MAXIMUM RATES OF FERTILISER APPLIED WITH THE SEED IN WINTER CROPS

The maximum application rate of fertiliser in the seed furrow is influenced by the susceptibility of the crop species to ammonia and osmotic effects of the fertiliser, application equipment and soil conditions.

The recommendations in this guideline for seed row fertiliser were developed using research by Incitec Pivot Fertilisers and data from Canadian and Australian. They consider crop species, the chemistry of the fertiliser, soil conditions and application equipment. The information should be used as a guide only.

The maximum rate of fertiliser is estimated using three pieces of information – the seed bed utilisation percentage, soil moisture and soil texture.

Seed-bed utilisation percentage (SBU%) describes the effect of row spacing and opener type on seed furrow fertiliser concentration. It is calculated as:

$$\text{Seed bed utilisation \%} = \frac{\text{Width of the seed row}}{\text{Row spacing}} \text{ x } 100$$

Table 1 shows the estimated seed spread from different opener types. You should check seed and fertiliser spread in the paddock at sowing. The width of seed and fertiliser spread varies with air flow, soil type, soil tilth, moisture level, amount of stubble and other soil conditions at the time of sowing (Table 3). Worn points and discs can also affect seed furrow width. Note: some disc openers may have seed spreads less than 25 mm.

Soil moisture can decline rapidly after sowing depending on the opener, press wheels, residue, weather, equipment speed etc. Fertiliser has an osmotic effect and competes with the germinating seed for moisture. So even at low fertiliser rates, crop emergence may be delayed by a couple of days.

Table 1: Estimated seed spread from different opener types.

Opener type	Seed Spread (mm)
Disc/knife	25
Spear point	25
65 mm Wide Sweep	46
125 mm Wide Sweep	65

Table 2: Correlation between soil texture and texture class.

Texture	Texture class
Clay to heavy clay	Heavy
Loam to clay loam	Medium
Sandy loam	Light

Table 3: Differences in seed bed utilisation for a range of seeding points and boot combinations. Source: Norton and Desbiolles (2011) GRDC.

Seeding point	Common seed spread (mm)	% seed bed utilisation (SBU)		
		Row spacing (mm)		
		150	225	300
125 mm share	65	43	29	22
65mm share	46	31	20	15
Single side band opener	36	24	16	12
Spear point	25	17	11	8
Inverted T	25	17	11	8

To use the tables below:

1. Calculate the seed bed utilisation.
2. Locate the table for the crop type and fertiliser product
3. Choose the relevant soil moisture status. If rapid drying of the seed zone (warm, dry, windy) is likely after sowing, choose the next lowest moisture status.
4. Choose the approximate SBU% and soil texture class.
5. Find the intersection of the relevant row and column. The value is the suggested maximum rate in kg/ha of product.

kg/ha		Good soil moisture			Average soil moisture			Poor soil moisture		
	SBU %	Heavy soil	Medium soil	Light soil	Heavy soil	Medium soil	Light soil	Heavy soil	Medium soil	Light soil
Wheat, barley - Urea	5	55	45	25	40	30	20	30	25	15
	10	60	50	30	40	35	20	30	25	15
	15	65	55	35	45	40	25	35	30	20
	20	70	60	40	50	40	30	35	30	20
	25	75	65	45	55	45	30	40	30	20
	30	80	70	50	60	50	35	40	35	25
	40	95	80	60	65	55	40	50	40	30
	50	105	90	65	75	60	45	50	45	35
Wheat, barley - DAP	5	80	60	40	55	45	25	40	30	20
	10	90	70	45	60	50	30	45	35	20
	15	95	75	50	65	55	35	50	40	25
	20	100	83	55	70	60	40	50	40	30
	25	110	90	60	75	65	45	55	45	30
	30	120	95	70	80	70	50	60	48	35
	40	135	110	80	90	80	55	70	55	40
	50	150	125	95	105	90	65	75	60	50
Wheat, barley - MAP, Granulock® Z	5	110	90	50	75	60	35	55	45	25
	10	120	95	60	85	65	40	60	50	30
	15	130	110	70	90	75	50	65	55	35
	20	140	115	80	100	80	55	70	60	40
	25	150	125	90	110	90	60	75	65	45
	30	165	135	95	115	95	65	80	70	50
	40	190	155	115	130	110	80	90	80	55
	50	210	175	130	145	122	90	105	90	65
Wheat, barley - CK700	5	70	55	35	50	40	25	35	30	15
	10	80	65	40	55	45	30	40	30	20
	15	85	70	45	60	50	30	45	35	25
	20	95	75	50	65	55	35	45	40	25
	25	100	85	55	70	60	40	50	40	30
	30	110	90	65	75	60	45	55	45	30
	40	125	100	75	85	70	50	60	50	35
	50	140	115	85	95	80	60	70	60	45

kg/ha		Good soil moisture			Average soil moisture			Poor soil moisture		
	SBU %	Heavy soil	Medium soil	Light soil	Heavy soil	Medium soil	Light soil	Heavy soil	Medium soil	Light soil
Canola, linseed - Urea	5	15	10	0	10	5	0	10	0	0
	10	25	15	0	15	10	0	15	0	0
	15	30	20	10	20	15	5	20	15	0
	20	40	25	15	25	20	10	25	20	10
	25	45	30	20	30	20	15	30	20	15
	30	55	35	25	35	25	15	35	25	15
	40	65	50	35	45	35	25	45	35	25
	50	80	60	45	55	45	30	55	45	30
Canola, linseed - DAP	5	25	10	0	15	0	0	0	0	0
	10	35	20	0	25	15	0	15	0	0
	15	45	25	15	30	20	0	20	15	0
	20	55	35	20	40	25	15	25	20	0
	25	65	45	25	45	30	20	30	20	15
	30	75	55	35	55	35	25	40	25	15
	40	95	70	50	65	50	35	50	35	25
	50	115	85	60	80	60	45	60	45	30
Canola, linseed - MAP, Granulock® Z	5	35	15	0	25	0	0	15	0	0
	10	50	25	0	35	20	0	25	15	0
	15	60	40	20	45	25	15	30	20	0
	20	75	50	30	55	35	20	40	25	15
	25	90	60	40	65	45	25	45	30	20
	30	105	75	50	75	50	35	55	35	25
	40	135	100	65	95	70	45	65	50	35
	50	160	120	85	115	85	60	80	60	45
Canola, linseed - CK700	5	20	0	0	15	0	0	0	0	0
	10	30	15	0	20	0	0	15	0	0
	15	40	25	15	30	20	0	20	15	0
	20	50	35	20	35	25	15	25	15	0
	25	60	40	25	40	30	20	30	20	15
	30	70	50	30	50	35	20	35	25	15
	40	90	65	45	60	45	30	45	30	20
	50	105	80	55	75	55	40	55	40	30

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Desbiolles, J. (1998) Soil Bin Evaluation of Seeding and Deep Banding Equipment. University of South Australia AMRDC Commercial Research Report.

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Dowling, C W (1998) Seed and seedling tolerance of cereal, oilseed, fibre, and legume crops to injury from banded ammonium fertilisers.

Norton R and Desbiolles J (2011) Fertiliser Toxicity. Fact Sheet. GRDC.

SAFETY DIRECTIONS

Refer to the Safety Data Sheet (SDS) for more detailed safety advice. Before use, read the Product Label and the SDS. Use safe work practices and avoid contact with the eyes and skin. Avoid ingestion and inhaling dust. Protective clothing, eyewear and dust masks should always be used when dealing with this product. Observe good personal hygiene, including washing hands after use. Avoid loss of fertiliser to waterways.

WARNING

This document contains information of a general nature. Before using fertiliser seek independent agronomic advice. Fertiliser programs may need to be varied depending on the plants being grown, climatic and soil conditions, application methods, irrigation, agricultural and livestock management practices, the soil's fertility, and cultural practices. ('Unforeseen Elements')

Fertiliser may burn and/or damage crop roots or foliage. Foliar burn to the leaves, fruit or other plant parts is most likely to occur when fertilisers are foliar applied at high concentrations and/or on a regular basis, different products are mixed and sprayed together at cumulatively high rates, the water is of poor quality, or the spray is applied under hot dry conditions, e.g. in the heat of the day.

Fertiliser and supplements may affect animal health. Seek independent advice before using any supplements in livestock rations.

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