Seed rate guide

Lady Rosetta

What's new?

Previous seed rate guides have offered recommendations simply to optimise total yield from ware production. This new guide, based on Potato Council-funded research, recognises the importance of tuber size to the value of your crop. It also accounts for the effect of seed age on main-stem numbers and their influence in determining optimum seed rate.

How do I influence stem numbers?

Years of research at Cambridge University Farm (CUF) have refined understanding of the relationship between the number of stems produced and seed size. Recent research has quantified how seed age, measured as the period from emergence of the seed crop to planting of the ware crop, also has an influence. These findings have been distilled into these recommendations, which account for both seed age and size. For example, to produce more stems at the same plant population (within-row spacing) you should use older and/or larger seed.

How will this help?

Based on your target yield and optimum tuber size, you can use this guide to estimate required plant density and seed rate. This will help maximise the value of your crop through increasing yield of the desired size. These recommendations should help reduce waste and also enable seed to be used efficiently, helping you save seed costs.

What about crop uniformity?

Uniform crop establishment and growth should reduce variability in size and quality of the harvested produce. In a less uniform crop there will be a greater proportion of very large and small tubers. Among other factors, planting precision, good soil preparation and pathogen/pest control will help uniformity and maintain tuber numbers and yield.

What other factors may influence seed rates?

It is recognised that factors other than those accounted for in this guide may affect the number of tubers and thus seed rates. Additional research is being carried out at CUF attempting to identify and quantify the important factors. Where appropriate the findings will lead to refined seed rate recommendations. At present these guides do not specify different seed rates for use of cut, physiologically-aged or chitted seed.

How to use this guide

Step One

Determine seed age

Your seed supplier should be able to give you this information. Ideally it is the period from emergence of the seed crop to planting of the current crop. If no information on seed emergence date is available, the date of herbicide application may be useful, but the date of planting is not a substitute.

Standard-aged seed will have emerged in early June – use the middle section of the table, shaded beige.

Recommended plant populations are lower for **early-emerged seed** – use the top section of the table, unshaded.

Recommended plant populations are higher for **late-emerged seed** – use the bottom section of the table, shaded green.

In our example we are working with Early seed (top section of table).

Yield (t/ha)			
55			
Plant density (000/ha) Seed rate (t/ha)		**Plant dens. Seed rate**	
Early seed (emerged 1 May)			
51	1.07	59	1
48	1.20	56	1
44	1.37	51	1
38	1.60	45	1
35	1.75	40	2
33	1.83	38	
31	1.92	36	
28	2.02	33	
26	2.14	30	
23	2.26	2	
19	2.40		

...seed (emerg...

Step Two

Determine seed tuber count

Once you have chosen which section of the table you need to use, count the number of tubers in a 50kg sample of the seed. This will decide which row you will use to determine density and seed rate. Note that closely graded seed will produce a more uniform stem density in the subsequent crop. Consider split grading highly variable seed and deal with each grade of seed separately. In our example we have a 2000 tuber count.

Tuber count / 50kg	Plant d... Seed...
Ear...	
2400	51
2000	48
1600	44
1200	38
1000	35
900	
800	

Step Three
Determine target yield and optimum tuber size

Experience, field history and other factors will determine target yield, while your target market may specify a different optimum average tuber size. Discuss with your customer or agronomist to agree target yields and value of different fractions. The table offers guidance on plant densities for a yield of 55 or 60t/ha and an average tuber size of 60mm. Your target yield will determine which column you use. In our example we have a target yield of 55t/ha.

Make a note of the seed rate, in this case 1.20t/ha, multiplying this by the number of hectares to be planted with this size seed will give you your total seed requirement.

count 50kg	Plant density (000/ Seed rate (t/ha)	
	Early seed (eme	
2400	51	1.07
2000	48	1.20
1600	44	1.37
1200	38	1.60
1000	35	1.75
00	33	1.83
	31	1.92
	28	2.
	26	

Step Four
Calculate your within-row spacing

Seed Spacing in row (cm)

$$\frac{100{,}000}{48 \times 91.4} = 22.8$$

Row width (cm)

Plant density (000/ha)

Step Five
Are these seed rates appropriate?

Areas shaded red indicate plant populations below 26,000 plants per hectare which are not generally recommended. Planting at wide spacings can result in unacceptably gappy crops, particularly where planting is irregular or emergence is poor.

Seed rate guide for Lady Rosetta for specified yield with a target average tuber size of 60mm† and a planting date of 15 April

Tuber count / 50kg	Yield (t/ha)			
	55		60	
	Plant density (000/ha)	Seed rate (t/ha)	Plant density (000/ha)	Seed rate (t/ha)
Early seed (emerged 1 May)				
2400	51	1.07	59	1.24
2000	48	1.20	56	1.39
1600	44	1.37	51	1.59
1200	38	1.60	45	1.85
1000	35	1.75	40	2.02
900	33	1.83	38	2.12
800	31	1.92	36	2.23
700	28	2.02	33	2.34
600	26	2.14	30	2.47
500	23	2.26	26	2.62
400	19	2.40	22	2.78
Standard seed (emerged 1 June)				
2400	65	1.34	75	1.56
2000	60	1.50	70	1.74
1600	55	1.71	63	1.98
1200	47	1.97	55	2.29
1000	43	2.14	50	2.48
900	40	2.23	47	2.59
800	37	2.34	43	2.71
700	34	2.45	40	2.84
600	31	2.58	36	2.98
500	27	2.71	31	3.14
400	23	2.87	27	3.32
Late seed (emerged 1 July)				
2400	86	1.80	100	2.08
2000	80	1.99	92	2.31
1600	72	2.23	83	2.59
1200	61	2.55	71	2.95
1000	55	2.74	63	3.17
900	51	2.84	59	3.29
800	47	2.96	55	3.42
700	43	3.08	50	3.57
600	39	3.22	45	3.72
500	34	3.36	39	3.89
400	28	3.52	33	4.08

†Average tuber size is the grade with the greatest proportion of yield and yields indicated are the total tuber yields. The column headed 55t/ha is generally suitable for crops with expected yields up to 55t/ha. Where yields >55t/ha are expected, the increased seed rate indicated for a target average tuber size of 60mm will reduce the proportion of large tubers but use of lower seed rates could be considered if this is not important as ware yield may be unchanged. Where the average tuber size = 60mm, *c*. 3% of yield can be expected to be below 40mm and little yield above 80mm is likely. (Coefficient of variation assumed to be *c*. 0.18). For red shaded area see Step Five in main text.

Using the new seed rates

Growers are encouraged to try the new seed rates on their own soil type and conditions by planting a few rows in the first year so that the new rates can be compared to standard practice.

Where seed age, planting date and target tuber size do not match the examples, some interpolation is required. For seed age, the crucial factor is the interval between emergence of the seed crop and planting of the subsequent crop. For example, for Standard Seed, where planting dates are substantially later than 15 April the chronological age of the seed may be regarded as falling into the Early seed category, however there may be confounding effects (notably that of soil temperature).

Further information

There are a range of research reports, available to levy payers, on the Potato Council website providing additional information on factors affecting marketable yield (www.potato.org.uk/publications). These include:

Factors affecting tuber numbers per stem leading to improved seed rate recommendations. DM Firman. 2008

Production practices, storage and sprouting conditions affecting number of stems per seed tuber and the grading of potato crops - (Report No.2004/14). DM Firman, EJ Allen & VJ Shearman. 2004

Evaluation of an N management and yield prediction model by Cambridge University Farm: MF Allison, EJ Allen, DM Firman, MA Stalham. 2008

While every effort has been made to ensure that the information is accurate, no liability can be accepted for any error or omission in the content of this guide.

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