



# 100 years of Forage Grass breeding at Aberystwyth

S. DULLER, A. LOVATT, L. SKØT

IBERS, Prifysgol Aberystwyth University, Gogerddan, Aberystwyth, SY23 3EB, UK



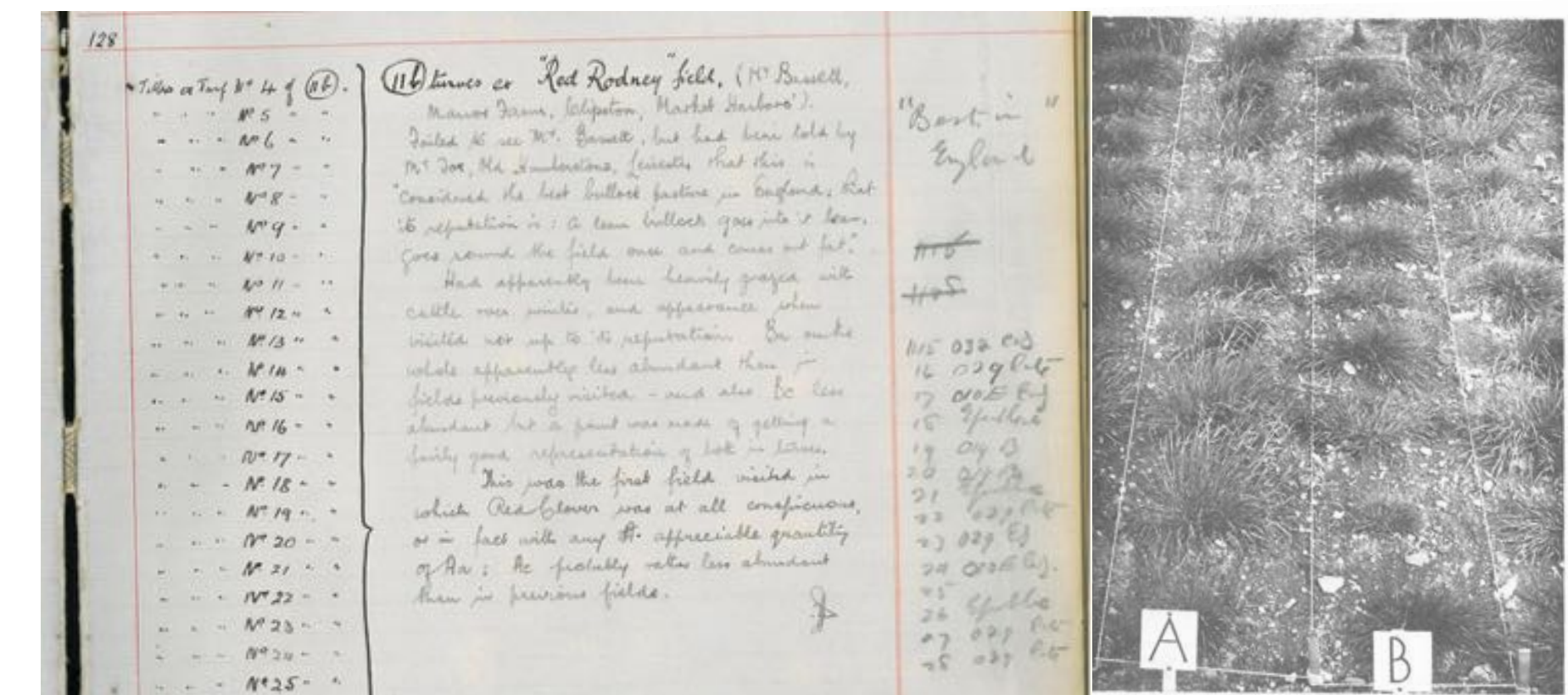
Sir George Stapledon

In 1919 Stapledon, TJ Jenkin, RD Williams and with financial backing from a small group of wealthy benefactors, founded the Welsh Plant Breeding Station (WPBS) at Aberystwyth University having seen a great need to increase the productivity of grasslands in the UK after so much land had been ploughed up for cereals during WWI.

In the early years a wide range of grass species were collected and evaluated for agronomic performance. Ecotype collections were made from renowned pastures across UK and Europe.

1922 Stapledon set out his 'Book of Words' describing in minute detail the methodology and recording of trials, procedures and classification of plants and populations.

The initial interest in species such as cocksfoot, once the main focus for improvement, were overtaken by the plasticity, feed quality and response to nutrients of ryegrass.



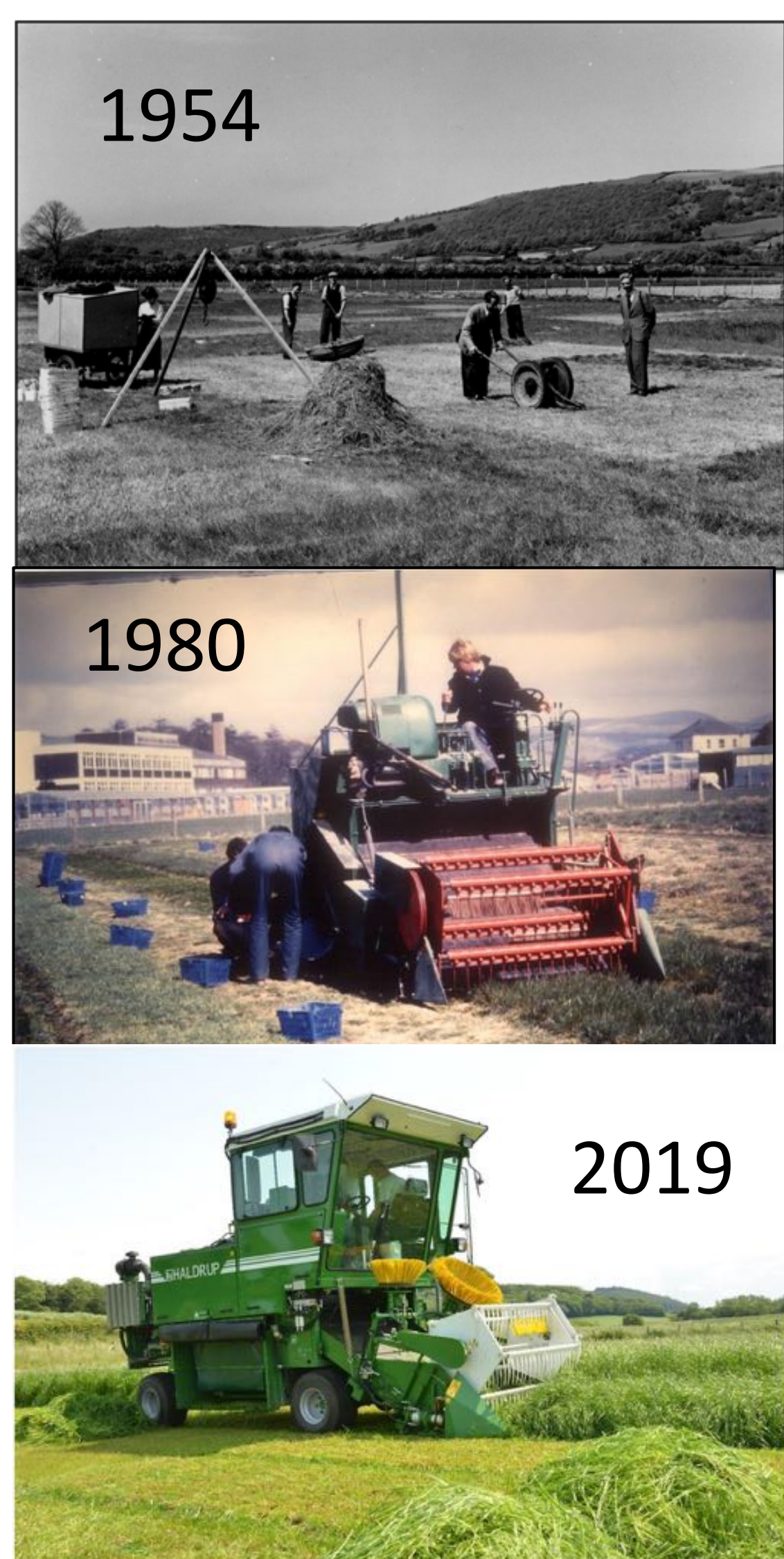
## Pair crossing



Numbers of varieties produced and in commerce 1930 – 2018

	1930 - 1947		1968-1987		1987-2018	
	Produced	Commerce	Produced	Commerce	Produced	Commerce
<i>Lolium perenne</i>	8	3	25	1	56	25
<i>L. multiflorum</i>	4	1	7	52	5	3
Hybrid ryegrass	-	-	8	3	15	7
<i>Dactylis glomerata</i>	37	4	7	3	1	1
<i>Phleum pratense</i>	7	3	2	-	-	-
<i>Festuca pratensis</i>	2	2	1	-	-	-
<i>Festuca arundinacea</i>	2	3	3	1	-	-
<i>Festuca rubra</i>	6	2	2	1	4	3
<i>Agrostis</i> spp	-	-	2	1	2	2
<i>Festulolium</i>	-	-	2	1	2	1

The 1980's saw a shift in breeding perspective with renewed scientific interest in ruminant nutritional requirements. A partnership was formed with Germinal Holdings and plant breeding focussed on increasing the efficiency of ruminant milk and meat production, with emphasis on water soluble carbohydrate. Resulting in the 'Aber' prefixed varieties. In 2008 the institute was re-united with the University to form the Institute of Biological, Environmental and Rural Sciences.



Developments in gene sequencing open up great potential for targeting specific genes controlling desired traits rather than relying on chance recombination via conventional crossing. The application of genome-wide selection could deliver significant reductions in the time taken to breed varieties. Further developments in understanding the requirements of grazing animals has opened up new scope for breeders to modify the composition of forage plants. This is an exciting time with a resurgence of grass-based systems, where commercial and environmental factors combine to ensure that the development of high quality and yielding forage varieties is ever more important to meet the demands of modern agriculture.



Advances in scanning techniques are introducing 'phenomics' to better understand plant physiology and environment interactions



The Beginning  
Foundation Work  
Working with Industry  
The Future

1946 1960 1970's 1990's 2019