Review of the 1994 UK wheat harvest
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To put the 1994 wheat crop data in perspective it is necessary to consider some background information about wheat and wheat flours used by the UK baking industries. This paper Will start with some historical information and background to wheat flour production in Britain. The body of data about the 1994 wheat crop comes from information provided by Cereal Industries wheat trading companies, trial millings and laboratory data from Weston Research Laboratories and results from the intake testing and milling of the new crop grain by Allied Mills. Finally there will be a mention of new wheat varieties which may be of interest to millers and bakers in the future.

Background

In recent years the major part of the UK wheat harvest has gone to animal feed, but the other two important market sectors are exports and flour milling.

The British flour milling industry uses approximately 5 million tonnes of wheat each year to produce 4 million tonnes of flour. Breadmaking flour accounts for 64% of the tonnage, biscuit flour another 14% and all the other flour types make up the remaining 22%. Mention of these statistics makes it unnecessary to apologise for not spending time dealing with the specialised requirements for cake, batter coating and pastry flours. The salient tact is that UK millers need 3.2 million tonnes of Group 1 breadmaking wheat varieties each year.

Over the past decade the proportion of breadmaking wheat varieties in the crop has changed dramatically.

In 1984 more than half the crop was made up by breadmaking varieties and even in 1989 more than 40% of the harvest was what would now be classified as Group 1 breadmaking wheat. However, in the 1990s only 25% of the crop has been provided from breadmaking varieties and the trend seems to be going downwards.

Millers have filled the UK Group 1 shortfall with other European wheats in times when UK wheat quality was poor, but in future it could be that European wheats will enter the breadmaking grists in Britain because insufficient Group 1 wheat is being grown by UK farmers. The clearest trend, shown over the past decade, has been the reduction in North American wheats, which attract a massive import levy against European Community wheats. Success in the GATT talks could reduce these large financial penalties, but if there is no GATT agreement to unify world wheat prices, it appears that the UK millers will strive for self-sufficiency within the ever widening European Community.

1994 UK wheat crop

The 1994 UK wheat crop grew under very mixed conditions with the autumn and winter being wet and cold which delayed growth. However warm weather in April and May coincided with the major input of fertiliser treatments and the crop progressed rapidly. Disease levels were very low as the hot dry weather in June and July brought the 1994 crop to

maturity. Rain showers in August did not have adverse effects on the bulk of the crop but harvesting conditions in Scotland were difficult.

Despite the set-aside programme and farmers' perceived lack of financial incentive to grow breadmaking wheats, the 1994 UK wheat crop has been estimated by MAFF to be 13.4 million tonnes compared with 12.8 million tonnes in 1993. Grain traders and the National Farmers Union seem to agree on the 13.4 million tonnes estimated so the UK millers' requirement for 3.2 million tonnes of Group 1 breadmaking wheats could be met if grain quality is acceptable. Growing and harvesting wheat in more northerly latitudes is always a risky business and grain moisture content will always be very variable.

Not surprisingly the most variable and the highest moisture contents were recorded for wheats harvested in Scotland. However, any wet grain would be dried to below 160/0 before storage. In the first two months of the 1994 cereal year, Allied Mills accepted wheat with an average moisture content of 14.2% which is 0.2% lower than the 1993 crop average.

Wheat protein content has declined from the high levels recorded in the past decade. There is little difference in the mean value or the distribution of protein contents between the 1993 and 1994 Group 1 breadmaking wheat crops.

The Group 3 wheats are soft endosperm textured wheats which may be better suited to biscuit making than breadmaking and here too the protein contents show only a slight increase compared with the 1993 crop figures. The marginal increase in protein content of the 1994 crop Group 3 wheats may have more to do with the popularity with growers of the new variety Hunter than any climatic effect. Hunter normally has a higher protein content than the current dominant Group 3 wheat variety Riband.

As with moisture contents there are regional differences in the protein contents of 1994 crop wheats. The lowest protein content Group 1 wheats are to be found in Kent and Scotland with East Anglia and Lincolnshire providing the highest protein wheats in the crop. The most significant difference between the 1993 and 1994 wheat crops are in alpha amylase activity, indicated by the Hagberg falling number. There is a noticeable shift to higher Hagberg falling numbers in the 1994 crop of UK Group 1 breadmaking wheats compared with the 1993 crop.

The Group 3, soft endosperm textured wheats show a similar pattern to the Group 1 wheats and high cereal alpha amylase activity will not be a problem in either bread or biscuitmaking flours in the coming months. Specific weight may indicate how well a wheat grain has filled in its growing cycle and millers aim to accept breadmaking wheats which have a specific weight of 76kg/Hl or higher. These wheats may be expected to mill to a higher extraction rate and have less contamination of bran in the milled white flour than grains of lower specific weight. It appears that millers should not have any difficulty in milling the 1994 crop Group 1 wheats into good quality white flour as the majority of the Group 1 wheat will have specific weights in excess of 75kg/Hl.

Table 1 summarises the main characteristics of both the Group 1 and Group 3 UK wheats from the 1994 harvest. These figures are satisfactory and represent an improvement on the 1993 crop which had Hagberg falling numbers that were generally lower than desirable.

Table 1: 1994 UK wheats

	Group 1	Group 3
Specific weight (kg/Hl)	80.5	76.5
Protein content (%)	10.9	9.6
Hagberg falling number	330	280

Table 2: 1994 UK wheat flours

	Group 1	Group 2
Starch damage (%)	31	16
Colour grade	-0.8	-0.9
Resistance (BU)	350	155
Extensibility (cm)	18.2	15.9
Area (sq cm)	90	38

The more important flour properties are set out in table 2. The potential starch damage of the Group 1 and Group 3 wheats is very similar to the levels recorded for the 1993 crop wheats. However potential flour colour grades are significantly lower for the 1994 crop wheats compared with the 1993 crop wheats. Group 1 breadmaking wheats have milled on our laboratory mills into flours with 1.5KJ units lower than the equivalent 1993 crop wheats, and at marginally higher extraction rates. Group 1 wheat flours milled from 1994 Group 1 UK wheats exhibit elastic dough properties and respond well to the normal range of dough conditioners.

The Brabender Extensogram characteristics of 1994 crop Group 3 wheat flours are more resistant but have similar dough extensibilities to those seen for 1993 crop wheat flours. Biscuit makers are using the new crop flours without any need for process or recipe changes. From the information given so far it may appear that flour water absorption will not change since flour water absorption is mainly influenced by the moisture content, protein content and level of damaged starch in the flour. However other European wheats from the 1994 crop are significantly lower in protein content and these lower protein contents may have the effect of lowering UK flour water absorption. However, breadmaking doughs should handle well with no trace of stickiness due to high cereal amylase activity.

Breadmaking potential

Preliminary milling and test baking experiments indicate that 1994 Group 1 wheats have better breadmaking potential than noted for the 1993 crop wheats.

Although the information about the 1994 wheat crop should be good news for bakers there are future trends which must disturb both flour millers and bakers.

Wheat varieties

In the United Kingdom, the popularity of wheat varieties is short lived and the dominant varieties in all the classes keeps changing as the breeders introduce varieties with ever increasing yield potential. The Group 3 wheat variety Riband has been dominant in the crop

since 1991, but will drop below 30% in 1995 as the new soft endosperm textured wheat Hunter takes over.

Hunter may yield better than Riband, but this has been achieved by the introduction of the rye chromosome into its genetic make-up which normally also brings dough stickiness and a tendency for high alpha amylase activity. The ultra high yielding Group 2 hard textured animal feed variety Brigadier has come from nowhere in 1993 and may be challenging Riband for crop supremacy by 1995. The Group 1 wheat Mercia is being superseded by Hereward which may have even better dough mixing tolerance than Mercia, but by next year all the winter and spring breadmaking varieties put together may not provide enough grain for the demands of the UK flour miller.

It is the variability in breadmaking potential which worries millers most. Mercia, Hereward and Spark show minimum variation in loaf volume potential, but Pastiche and Talon failed as breadmaking varieties because of their variable quality. The new high yielding variety Rialto may have some breadmaking potential but samples seen to date have been of variable quality.

One small piece of good news could be represented by the new spring wheat Shiraz. Although soft endosperm textured, Shiraz does have very good breadmaking potential and would be ideally suited to the production of French style breads. However, spring wheats are almost insignificant in the UK crop which is 95% sown to winter wheats.

Conclusion

Rather than finish on a pessimistic note, let us end by remembering the good bread quality provided by the varieties Mercia and Hereward compared even with Avalon, which was the dominant breadmaking wheat of the 1980s.

These wheat varieties have good breadmaking properties and will provide the backbone for UK breadmaking flours until July 1995.