Husbandry Guidelines

istabraq
WINTER WHEAT

Nickerson (UK) Ltd,
Rothwell, Market Rasen, Lincolnshire, LN7 6DT
Tel: 01472 371471 Fax: 01472 371386
Web Site: www.nickerson.co.uk/istabraq.html
E-mail: enquiries@nickerson.co.uk

Introduction

Istabraq is a good example of harnessing the potential of genetic recombination. This variety was selected from the cross Claire x Consort. This combination gave rise to a large number of very high yielding progeny. The variety Nijinsky was selected from the same cross as a shorter stiffer alternative to either of its parents. Istabraq on the other hand is slightly taller than both parents and is a very different variety to its sister line Nijinsky.

Istabraq has very high yield potential, has produced excellent yields in both first and second wheat situations and delivers grain with very good specific weight.

It is not unusual for one cross to produce varieties with different agronomic characteristics. Beaver and Haven were both selected from the same cross (Hornet x Moulin); Brigadier and Hussar were both derivatives of the cross Squadron x Rendezvous.

It is important that growers understand the finer nuances of new varieties. These guidelines are published in order to give growers confidence in managing Istabraq in such a way as to realise the yield potential of the variety, whilst maximising gross margins.

Bill Angus - Senior Wheat Breeder

Istabraq has produced excellent yields in first and second wheat situations

Istabraq has very good all round disease resistance

Istabraq WINTER WHEAT

Istabraq will satisfy the export specifications for the UKS export (soft wheat) category designated by British Cereals Exports (BCE)

Istabraq - Its Place in the Market

The UK has a long history in producing soft milling biscuit wheats. From the early 1970s varieties such as Norman, Longbow, Brock, Riband, Consort and Claire have established the UK as the world's leading producer of biscuit wheats. The widespread growing of Riband in the 1980s opened up export opportunities which were subsequently filled by Consort and Claire. Currently around 20% of the UK wheat crop is exported.

Istabraq will satisfy the export specifications for the UKS export (soft wheat) category designated by British Cereals Exports (BCE). The variety produces grain with excellent specific weight - a key requirement for export wheats as well as the domestic feed market. For further information on the HGCA British Cereal Export initiative see **www.hgca.com** and **www.ukwheat.com**.

Istabraq produces slightly weaker dough characteristics than Claire and Consort, similar to Riband and therefore will not be suitable for the majority of UK biscuit making requirements, though it is likely to suit other domestic soft milling markets. Istabraq has been placed in NABIM group 4 and growers wishing to maximise marketing opportunities should store grain separately from varieties such as Claire, Consort and Nijinsky.

Table 1. Export specifications for UKS wheats

	Export Specification	Claire	Consort	*Istabraq*
W value	⩽ 120	101	112	**73**
P/L value	⩽ 0.55	0.4	0.3	**0.3**
Protein (%)	10.5-11.5	11.6	11.6	**11.1**

Source: HGCA Recommended List 2005/06

Istabraq - Pedigree and Selection Mechanism

Pedigree: Istabraq = Claire x Consort

The background to the formulation of the pedigree for Istabraq has been outlined in the introduction. Although Claire and Consort produce grain of similar end use quality, they derive this from different genetic backgrounds. Claire inherited the excellent biscuit characters from the Nickerson variety Wasp whilst Consort was based on Riband. A primary of objective of this cross was to maximise the genetic gain in yield potential that could be realised from these two contrasting parents.

Table 2. Istabraq - derivation of breeding traits

	Claire	Consort	*Istabraq*
Yield treated	100	99	106
Yield untreated	81	73	85
Straw strength - PGR	6	8	5
Straw strength + PGR	7	9	7
Height without PGR (cms)	90	87	95
Resistance to mildew	4	6	5
Resistance to yellow rust	9	6	9
Resistance to brown rust	8	4	7
Resistance to *Septoria nodorum*	8	5	(8)
Resistance to *Septoria tritici*	6	4	6
Resistance to *Fusarium*	7	6	7
Resistance to eyespot	5	6	5
Primordia development	Late	Late	Late
Latest safe sowing date	End Feb	End Jan	End Feb

( ) = limited data

Source: HGCA Recommended List 2005/06

Istabraq is slightly taller than either of its parents but combines the very good disease resistance profile from Claire with excellent physical grain characteristics probably a reflection of the longer straw aiding robust grain filling. Standing power with PGRs is similar to Claire.

Istabraq has inherited from Claire a low vernalisation requirement, and thus the variety can be sown safely until the end of February.

Istabraq - Resistance to Disease and Pests

With low grain prices and concerns over reduced efficacy of some fungicides, Nickerson continue to emphasise the value of high levels of genetic disease resistance. Istabraq is no exception to this philosophy, combining an extremely robust disease profile with an attractive agronomic type. The resistance profile of Istabraq is essentially the same as that found in Claire and thus growers familiar with Claire should experience few problems adapting their management experiences to Istabraq, particularly with respect to fungicides.

This section explains the importance of disease resistance factors present within Istabraq as well as their prospects for longevity.

Yellow Rust

Since the introduction of Claire (the disease resistant parent of Istabraq) a large amount of work has been carried out to determine how robust the yellow rust resistance factors used in this variety are.

This resistance has been utilised in a range of varieties such as Parade, Buster and Dynamo as well as more modern varieties such as Claire, Nijinsky and Istabraq. Sporadic reports of breakdown have been received over the last thirty year period. All these have been checked by the Nickerson breeders/pathologists with no recorded incident having been verified. Research at the John Innes Centre, Norwich, indicates that a number of partial resistance genes are working together to produce this highly effective level of resistance. The combination of a number of partial resistance genes, rather than simple major gene protection, gives credence to the expectation that this resistance will have longevity in commerce. One observation that has been made is that sometimes very low levels of yellow rust can be found when grown alongside very susceptible varieties. Any sporulation will soon dry up and thus fungicidal control measures will be unnecessary.

Yellow Rust

Growers, agronomists and advisers have become complacent over the threat of this potentially very damaging disease. With over 25% of the UK acreage now sown to susceptible or very susceptible varieties (HGCA ratings of 3 or 4) growers should monitor their crops regularly. If one takes into account the area sown with varieties that can potentially carry a high level of yellow rust (HGCA ratings 5 or 6) this vulnerable area rises to 46%. Istabraq and its sister line Nijinsky should feature as part of an overall control strategy as they can be sown safely alongside more susceptible varieties.

Brown Rust

Brown Rust

Istabraq has good resistance to brown rust (HGCA rating 7). However growers in high risk areas should include a T3 fungicide application as routine. Brown rust epidemics have been rare over the last few years but as with yellow rust there is potential for an increase in this disease should conditions favour it.

Septoria

The profile of this particularly damaging disease has been raised by the appearance, over the last few years, of strobilurin-resistant races of *Septoria tritici*. Indeed such has been the evolution of strobilurin resistance that no part of the UK wheat growing area has been left unaffected. Istabraq combines a high level of resistance to *Septoria tritici* with a very high level of resistance to *Septoria nodorum*.

The use of triazole and chlorothalonil based products will be of high value to growers but this **must** be combined with good genetic resistance. The resistance to *Septoria spp* within Istabraq has not been fully characterised but work at the John Innes Centre, Norwich, suggests a number of genes are involved in this complex characteristic. There has been some speculation that Istabraq's resistance, derived from Claire, has been eroded over time. Careful monitoring of disease nurseries and disease 'hotspots' indicates that there has been no significant change to the effectiveness of this highly effective resistance.
This resistance is not complete and growers should therefore use appropriate fungicide measures to complement the genetic resistance.

Mildew

Istabraq has similar levels of resistance to Consort (HGCA rating = 5). This disease can be problematic if left unchecked but growers should experience no problems if they follow the agronomic advice within this booklet.

Powdery mildew - assess the level of risk, and choose the appropriate control measures.

Eyespot

Both Claire and Consort exhibit an acceptable level of resistance to eyespot and Istabraq is believed to inherit this resistance (HGCA eyespot rating = 5). This resistance is believed to be inherited from the French variety Cappelle Desprez, which was widely grown in the UK in the 1950s, 60s and 70s. This resistance has been effective over a long period and in first wheat situations control measures are unlikely to be cost effective. However in second/continuous wheat situations fungicide control measures should be used to enhance the genetic resistance. Cyprodinil based products e.g. Unix (**www.syngenta.com**) have proven to be the standard for eyespot control and these products can be used in high risk situations to complement the genetic resistance available in Istabraq. Other products such as Proline (Bayer) and Tracker (BASF) are also claimed to be effective.

Fusarium

There are increasing concerns over the levels of mycotoxins present in wheat crops. *Fusarium* spp will enhance the development of mycotoxins (particularly *Fusarium graminearum* and *Fusarium culmorum* which produce several mycotoxins including deoxynivalenol (DON) and nivalenol (NIV)). These mycotoxins can be harmful if fed to animals or humans.

Istabraq has excellent resistance to *Fusarium spp* (HGCA rating 7) but in high risk years and particularly when wet weather coincides with flowering, fungicides should be used to complement the high levels of genetic resistance found in Istabraq. Wheat in maize rotations is particularly vulnerable to *Fusarium* attack.

Resistance to Wheat Orange Blossom Midge

Wheat orange blossom midge (WOBM) has become a major pest over the last three years (2002-4 inclusive). Differences in resistance have been identified in a range of varieties. Istabraq falls into the category as having a 'moderate' level of resistance. As such, under high risk situations, applications of chlorpyrifos based products should be considered. This is the only product with approval for the control of WOBM and is the only chemical with the necessary persistence to control hatching over a period of several days. Attempted control using pyrethroid based products may exacerbate the problem as these products may reduce the natural enemies of WOBM - hymenopterous parasitoids. Growers should seek advice from Dow Chemicals (**e-mail fhihotl@dow.com or freephone 0800 689 8899**) regarding the use of their chlorpyrifos based products.

Pictures courtesy of ADAS

Wheat Orange Blossom Midge

Istabraq - Yield Potential

Istabraq has been evaluated in HGCA Recommended List trials for a period of two years, following two years in NIAB/BSPB National List trials. There is thus a robust database for evaluation. Following these trials Istabraq has been shown to have a 6% yield advantage over Claire and 7% over Consort. In comparison to the NABIM group 4 variety Tanker, this advantage is 3%. Istabraq has produced consistently high yields across the UK with no regional weaknesses.

Istabraq does have only moderate standing power (HGCA rating 5) when untreated with Plant Growth Regulators (PGRs). However the variety is very responsive to these products resulting in a high standing power rating when treated (HGCA rating 7). This is very much in line with the rating for Claire. It is important that PGRs are applied as routine to realise the very high yield potential of this variety.

Table 3. Yield

					Rotational Positon		Soil Type	
	UK	North	East	West	First Cereal	Second & more	Light Soils	Heavy Soils
Istabraq	***106***	***106***	***106***	***106***	***106***	***106***	***106***	***105***
Claire	100	98	102	102	102	99	101	100
Consort	99	100	99	99	99	100	99	99
Tanker	103	103	102	103	103	103	102	103

Source: HGCA Recommended List 2005/2006

Istabraq - Place in Rotation

Early Sowing

Istabraq should not be considered for early sowing - primarily because it has long straw. In common with Claire, Istabraq has a prostrate winter habit and late primordia development.

Late September to End October

Istabraq is an ideal candidate for this drilling period. The variety produces high tiller numbers and a prostrate winter habit. Seed rates should be in line with those in table 5. The variety has a good level of resistance to all the major foliar diseases. Earlier drilling will tend to increase straw length and such crops should be monitored carefully in the spring, in order to target PGRs precisely.

Growth room tests show that Istabraq (like Claire) will produce ears after as little as 4 weeks vernalisation

Late Sowing (November Onwards)

Istabraq is an ideal candidate for later drillings. Like Claire, the variety has a very low vernalisation requirement and thus can be sown safely until the end of February. HGCA trials have identified Istabraq as the highest yielding variety from later sowings as shown in table 4.

Table 4: Istabraq yields in late sown trials

	Yield
Istabraq	***116***
Consort	106
Malacca	104
Option	105
Tanker	107
Claire	107

Source: HGCA Autumn Sown Wheat Recommended List 2005/2006

Later drilled crops are often vulnerable to late season stresses during grain filling but Istabraq will tend to take advantage of its better 'finishing' characteristics to produce grain of good specific weight.

Second or Continuous Wheats

The database available to growers to select varieties better suited to second wheat situations is now extensive. Approximately one third of HGCA trials are now sown in second or more continuous wheat situations. Istabraq has performed well in this difficult rotational slot giving yields 6% higher than Consort and 7% higher than Claire (Source: HGCA Winter Wheat Recommended List 2005/6).

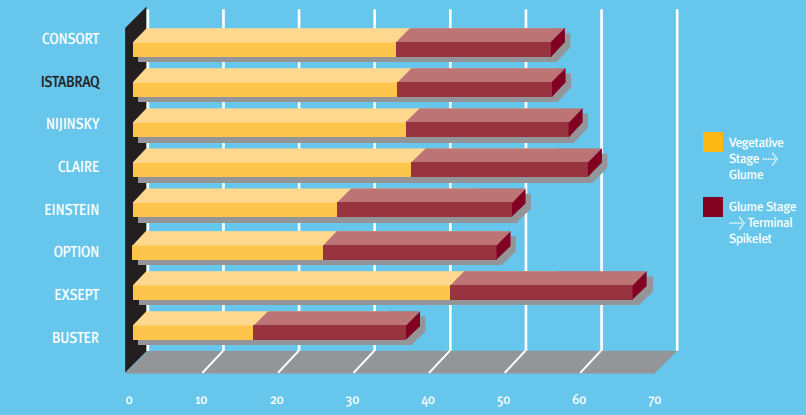
Istabraq - Response to Plant Growth Regulators (PGRs)

PGRs should be used routinely with Istabraq, noting that the variety has a development pattern very similar to its parent Claire. Growers familiar with Claire will be accustomed to the late development pattern associated with this type of variety. Nickerson experience has been that PGRs targeted at the glume primordia stage give the most effective response. The first application of a split PGR programme should be targeted at the 'glume primordia' development stage. This will shorten the first internode and thus increase straw stiffness. The following chart shows the developmental patterns of a number of key varieties. The best way to determine the developmental stage is by dissection but PGRs targeted at the stage when the first node is starting to move off the base is acceptable for those unfamiliar with plant dissection techniques.

Istabraq has moderate standing power and lodging control should be given priority. Seed rates should be adjusted to minimise excessive tiller production and nitrogen applications, on first wheats, should be delayed until just prior to the terminal spikelet development stage. In second wheats, or poorly established crops, low rates of nitrogen (less than 40kg/ha) can be applied earlier to maintain tiller or plant numbers.

A chlormequat product should be applied as routine to all Istabraq crops. If weather conditions do not permit a split application, then a full rate CCC + Moddus (Syngenta) application should be made at Zadoks GS31. Growers should also consider the use of Meteor (BASF) in combination with CCC at the glume primordia stage. If seed rates, nitrogen use and early PGR applications are in line with the guidelines in this booklet only crops at high risk from lodging should require additional treatment with applications of 2-chloroethylphosphonic acid + mepiquat chloride based products (e.g. Terpal).

Chart 1. Ear Primordia Development



Istabraq - Seed Rates and Treatments

Istabraq produces a prostrate winter habit and has a high tillering capacity. It is important that seed rates be reduced in line with those advised in table 5 to minimize lodging threat. Seed rates should be determined by an evaluation of sowing date, soil conditions and moisture availability, geographic region and potential pest problems.

Table 5: Recommended seed rates for Istabraq winter wheat

Time of sowing	Seeds/m² (Ideal Conditions)	Seeds/m² (Adverse Conditions)
Sept 20th - 25th	160-200	200-280
Sept 26th - Oct 5th	220-275	275-325
Oct 6th - Oct 31st	265-325	325-375
Nov 1st - Nov 30th	300-350	350-425
Dec 1st - Feb 28th	325-375	375-450

In first wheat situations a single purpose treatment should be applied as routine as even healthy looking grains can harbour disease in high risk years. For early sown crops the application of a broad spectrum seed dressing should be considered. This type of dressing is likely to improve early vigour, enhance disease protection and improve standing power.

In second wheat or continuous wheat situations or where take-all is likely to present a problem, products such as Jockey (**www.basf.de/en/produkte**) or Latitude (**www.monsanto.co.uk**) should be considered. However take-all is a sporadic problem and these treatments should be reserved for high and very high risk situations.

Nickerson suggest the use of reduced seed rates for Istabraq with some of the financial savings re-invested in better quality seed and improved seed dressings.

Good quality seed with the appropriate seed treatment will produce a uniform standing crop

Istabraq - Tolerance to Herbicides

Field tests by Makhteshim Agan (**www.mauk.co.uk**) indicate that Istabraq can be sprayed safely with Alpha Chlortoluron 500 (Dicurane).

Istabraq - Response to Fungicides

There is a lot of conflicting advice with regard to the utilisation of strobilurin chemistry, following the widespread resistance of *Septoria tritici* to this product group. In addition higher rates of triazole chemistry are likely to be required to achieve the same control of this disease compared to four years ago. With grain prices low it is important to choose varieties, such as Istabraq, with inherently high levels of genetic resistance.

Nickerson has a philosophy of testing newer varieties with new and established fungicides and results are shown for the years 2003 and 2004. These two years contrasted as 2003 was a dry summer and 2004 was relatively wet.

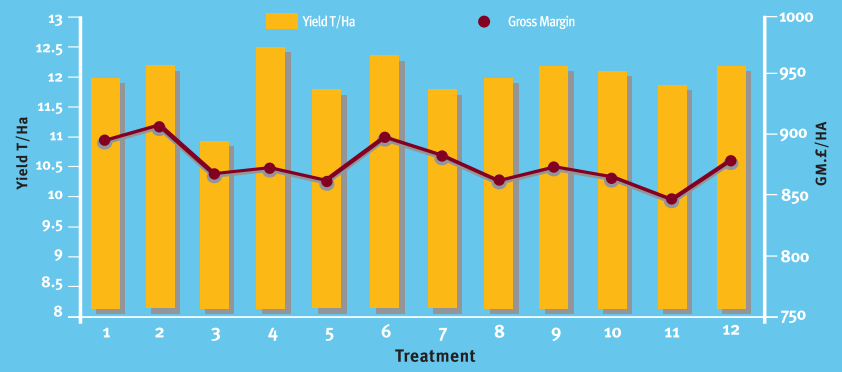
Table 6 shows the fungicide treatments carried out in 2003. Individual treatments are shown along with their respective costings. It is impossible to test every possible combination of fungicides but an attempt has been made to emulate strategies that individual growers may use. Of particular note is that treatment 3 is completely untreated with fungicide and treatment 4 is the HGCA Recommended List protocol.

Table 6. Treatment Costings £/ha 2003

TREATMENT CODE	FUNGICIDE TIMING T1 (GS 31/32) CHEMICAL	L/Ha	CHEM COST	FUNGICIDE TIMING T2 (GS 37/39) CHEMICAL	L/Ha	CHEM COST	FUNGICIDE TIMING (GS 55) CHEMICAL	L/Ha	CHEM COST	FUNGICIDE TIMING T3 (GS 61/65) CHEMICAL	L/Ha	CHEM COST	TOTAL CHEM COST	TRAVEL COST £7/Ha	COST OF TREATMENT £/Ha
1	OPUS	0.5	10.50	OPUS	0.75	15.75				FOLICUR	0.5	7.75	34.00	21.00	55.00
2	LANDMARK	0.5	14.75	LANDMARK	0.75	22.13				FOLICUR	0.5	7.75	44.63	21.00	65.63
3	UNTREATED		0.00	UNTREATED		0.00	UNTREATED		0.00	UNTREATED		0.00	0.00	0.00	0.00
4	UNIX OPUS AMISTAR	1.0KG/Ha 0.75 0.6	22.20 15.75 14.82	OPERA	1.5	42.75				FOLICUR	0.75	11.62	107.14	21.00	128.14
5	LANDMARK	0.5	14.75	OPERA	1.2	34.20				CARAMBA	0.75	12.56	61.51	21.00	82.51
6	OPUS BRAVO	0.5 1.0	10.50 3.20	OPERA	1.2	34.20				SWING GOLD	0.75	14.80	62.70	21.00	83.70
7	LANDMARK	0.5	14.75				OPERA	1.2	34.20				48.95	14.00	62.95
8	ACANTO OPUS BRAVO	0.6 0.4 1.0	16.26 8.40 3.20	AMISTAR OPUS BRAVO	0.75 0.4 1.0	18.52 8.40 3.20				FOLICUR	0.4	6.20	64.18	21.00	85.18
9	OPUS BRAVO	0.5 1.0	10.50 3.20	AMISTAR OPUS BRAVO	0.75 0.4 1.0	18.52 8.40 3.20				AMISTAR FOLICUR	0.4 0.4	9.88 6.20	59.90	21.00	80.90
10	ACANTO OPUS BRAVO	0.6 0.4 1.0	16.26 8.40 3.20	OPUS BRAVO	0.75 1.0	15.75 3.20				AMISTAR FOLICUR	0.4 0.4	9.88 6.20	62.89	21.00	83.89
11	TWIST OPUS	0.8 0.5	12.16 10.50	TWIST OPUS	1.2 0.5	18.24 10.50				FOLICUR	0.5	7.75	59.15	21.00	80.15
12	TWIST OPUS BRAVO	0.8 0.5 1.0	12.16 10.50 3.20	TWIST OPUS BRAVO	1.2 0.5 1.0	18.24 10.50 3.20				FOLICUR	0.5	7.75	65.55	21.00	86.55

Treatment costs are based on product prices at time of application

Chart 2. Istabraq
Yield responses & gross margins for 2003



This fungicide regime has been developed to minimise any disease threat and is not designed to be a commercial programme. However this programme does reveal the 'potential' yield of the varieties under test. The rest of the programmes were then formulated to see how much of this potential can be captured.

Chart 2 gives the yield responses & gross margin for 2003. Treatment 4 gave the highest yields at 12.41 tonnes per hectare. This result should not be too surprising, bearing in mind the very high fungicide input costs (£128.14 per hectare). Treatment 6 gave the second highest yield (12.22 tonnes per hectare), with treatment 2 (12.11 tonnes per hectare) in third place. Treatment 6 is a programme based on using Opera at the T2 application time. In contrast treatment 2 is a Landmark based programme. These latter two programmes gave the best gross margins. However of interest is treatment 1 which is a triazole only programme. This gave a high yield (11.95 tonnes per hectare) but a very competitive gross margin - just £2 per hectare lower than the strobilurin based programme (treatment 6).

The use of Bravo (chlorothalonil) appears to have enhanced the performance of treatments 9 and 12 (as well as 6).

Treatments for 2004 are given in table 6 and results presented in chart 3. Again protocols and treatment costs are provided. Treatment 1 is untreated and treatment 2 the HGCA programme.

It is interesting to note that unlike 2003 the highest yield was not achieved using the HGCA fungicide programme (programme 2) but was obtained using programme 9 - a programme based around chlorothalonil (Bravo/Amistar opti). This programme involved the use of chlorothalonil at all spray timings, and resulted in the highest gross margins.

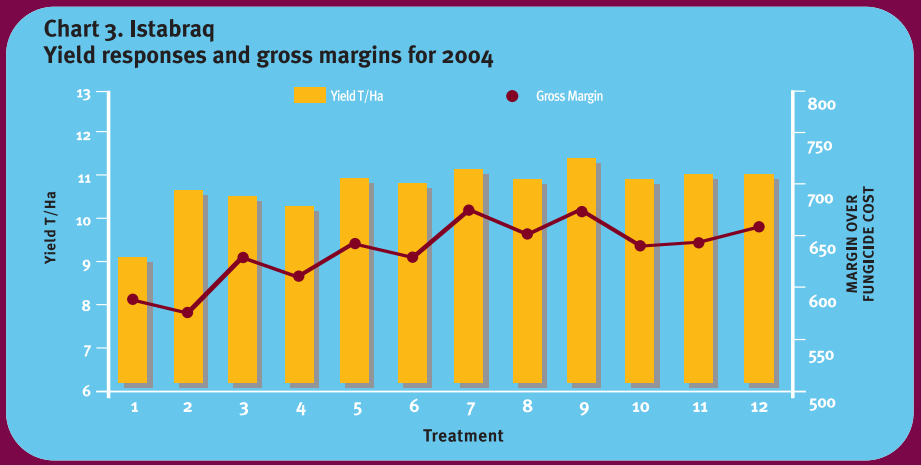
Treatment 7 (based on Amistar) delivered high yields and a high gross margin. The comparison between treatments 9 and 7 is interesting. The difference between the two treatments is the addition of chlorothalonil in treatment 9 at both T1 and T3. This additional chemistry clearly justifies the investment. Also of interest is the relatively low 'spend' on the T1

Table 7. Treament Costings £/ha 2004

CODE	T1 CHEMICAL	(GS 31/32) L/Ha	TREATMENT PRICE	T2 CHEMICAL	GS 39/45 L/Ha	TREATMENT PRICE	T3 CHEMICAL	GS 39/45 L/Ha	TREATMENT PRICE	TOTAL FUNG £
1	UNTREATED		0	UNTREATED		0	UNTREATED		0	
2	UNIX OPUS BRAVO	1KG/HA 0.75 1	22.4 17.10 3.30	OPERA BRAVO OPUS	1.5 1 0.2	41.10 3.30 4.56	AMISTAR FOLICUR	0.6 0.5	15.30 8.00	
			42.80			48.96			23.30	115.06
3	OPUS BRAVO	0.5 1	11.40 3.30	OPUS	0.75	17.10	FOLICUR	0.5	8.00	
			14.70			17.10			8.00	39.80
4	LANDMARK BRAVO	0.5 1	16.00 3.30	LANDMARK	0.75	24.00	FOLICUR	0.5	8.00	
			19.30			24.00			8.00	51.30
5	OPUS BRAVO	0.5 1	11.40 3.30	TWIST OPUS	0.8 0.75	12.00 17.10	FOLICUR TWIST	0.5 0.5	8.00 7.50	
			14.70			29.10			15.50	59.30
6	TWIST OPUS BRAVO	0.8 0.5 1	12.00 11.40 3.30	TWIST OPUS	0.8 0.75	12.00 17.10	FOLICUR	0.5	8.00	
			26.70			29.10			8.00	63.80
7	OPUS	0.5	11.40	AMISTAR OPTI OPUS	1 0.5	13.00 11.40	AMISTAR CARAMBA	0.3 0.5	7.65 8.25	
			11.40			24.40			15.90	51.70
8	OPUS BRAVO	0.5 1	11.40 3.30	AMISTAR OPTI OPUS	1 0.5	13.00 11.40	AMISTAR CARAMBA	0.3 0.5	7.65 8.25	
			14.70			24.40			15.90	55.00
9	OPUS BRAVO	0.5 1	11.40 3.30	AMISTAR OPTI OPUS	1 0.5	13.00 11.40	AMISTAR CARAMBA	0.3 0.5	7.65 8.25	
			14.70			24.40			19.20	58.30
10	OPUS BRAVO	0.5 1	11.40 3.30	OPERA OPUS	1 0.45	27.40 10.26	SWING GOLD	0.75	15.98	
			14.70			37.66			15.98	68.34
11	TRACKER BRAVO	1 1	23.00 3.30	OPERA OPUS	1 0.45	27.40 10.26	SWING GOLD	0.75	15.98	
			26.30			37.66			15.98	79.94
12	OPUS BRAVO	0.5 1	11.40 3.30	AMISTAR OPUS	0.5 0.4	12.75 9.12	AMISTAR FOLICUR	0.5 0.5	12.75 8.00	
			14.70			25.17			20.75	60.62

Treatment costs are based on product prices at time of application

Chart 3. Istabraq
Yield responses and gross margins for 2004



application. This is not surprising as the good level of genetic resistance to the key disease (*Septoria spp*) within Istabraq is able to carry the variety safely through to the key T2 stage without consequential yield loss.

Grain yield is not the only consideration when looking at fungicide strategies. It is important to recognise that grain marketability has increasing importance and thus maximising grain quality has to be a priority. To this end Istabraq crops should receive a robust T3 application. Whilst cost savings can be made by excluding this spray treatment the potential for the build up of ear diseases, which can have a significant detrimental effect on grain quality, is increased significantly. Experience over a number of years has highlighted the benefits of a combined strobilurin + triazole application at the T3 timing.
To date Amistar + Folicur/Caramba or Swing Gold has produced consistently good results.

Lush crops of Istabraq may prove to be vulnerable to mildew infections. This will be exacerbated by early applications of nitrogen, which should be avoided. In high mildew situations, as with Claire winter wheat, Quinoxyfen (Dow) or Flexity (BASF) should be considered.

Fungicide Strategy Summary

- A three spray fungicide programme should be considered as routine
- In terms of yield, applications of strobilurin chemistry which, by virtue of its effect on green leaf area duration are likely to be required - either at T2 or T3.
- In terms of gross margins triazole chemistry combined with chlorothalonil are likely to be the most cost effective. However strobilurin chemistry should be used as part of the T3 application.
- In high mildew situations, as with Claire winter wheat, Quinoxyfen (Dow) should be considered. Other products which have performed well include Flexity (BASF) which has curative action as well as protectant value.
- Even with a disease resistant variety such as Istabraq, reducing fungicide rates is likely to be counter-productive both in terms of yield and gross margins.

These guidelines are issued to give growers a wider insight to the variety Istabraq. They do not constitute recommendations and growers should seek guidance from manufacturers/agronomists to aid their decision making.

The full HCGA Recommended List Database can be consulted at www.hgca.com