High Quality Scotch Whisky Depends on Fungicide Use

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Scotch malt whisky is made from two key ingredients: barley and water. Barley has always been the primary raw material for conversion to malt due to the fact that the seed is covered with a straw-like husk that is not removed during threshing and protects the grain during processing. The proportion of Scottish barley in Scotch malt whisky is about 90% [5]. To be Scotch Whisky, the spirit must mature in oak casks in Scotland for at least three years. 90% of Scotch Whisky is exported (140 million cases/year) which generates £4.3 billion in export earnings for the UK.

In Scotland most of the barley crop consists of malting varieties and is grown with the hope of attracting a premium. In reality 40-60% of the crop meets the specification needed for a premium. The remainder is sold for animal feed. The nitrogen content of the grain is used as a guide to protein content. High protein content leads to haze and instability in the finished whisky, and also reduces the fermentable extract. Infections of foliar diseases can reduce photosynthetic area and restrict tillering leading to lower yields with N content above the acceptable level. Research has shown that fungicide applications cause a reduction in grain N to acceptable levels [6].

Barley is affected by a range of diseases that can cause considerable damage and loss of yield and quality annually. The major disease targeted by fungicide sprays in barley in Scotland are leaf scald or blotch caused by *Rhynchosporium commune* (formerly *R. secalis*), ramularia leaf spot and powdery mildew caused by *Blumeria graminis*.

In the early 1970s, fungicides were introduced for use on cereals-first for the control of mildew on barley. The yield from a fungicide spray for the control of powdery mildew was 12% higher than the yield of unsprayed barley [3]. Fungicides for control of *R. secalis* increased barley yield by one-third [4]. Recent research in Scotland on spring barley demonstrated that the yield response to fungicides averages approximately 1t/ha [1]. The use of fungicides on barley increased markedly from 3% in 1970 to 50% in 1980. The latest pesticide use survey for Scotland (2010) shows that 98% of winter barley hectares and 96% of spring barley hectares were treated with fungicides [2].

Policymakers in the EU have developed new rules regarding the use of pesticides which is reducing the number of active ingredients available for farmers to use. Reduced availability of fungicides for Scottish barley farmers would result in reduced yield and quality. It is not inconceivable that tighter pesticide regulation may result in greater demand from the whisky industry for imported malting barley, especially during shortfalls in the supply of Scottish barley [5]. Concerns about the possibility of an increasing reliance on imported barley have been raised by Scottish politicians and the media, carrying a notion of pride associated with the idea that Scotch malt whisky should be ‘100% Scottish’ [5].

Fungicide use is an integral part of barley cropping systems in Scotland, and without their use, grain quality and yield would be dramatically reduced [7].

References