

Agronomic & Other Benefits of Glyphosate for the EU 1, 2, 3, 4, 5

Introduction

The active ingredient glyphosate present in some of the most widely used broad-spectrum herbicides, accounts for some 25% of the global herbicide market. They are used in both agriculture and domestic situations and are a simple and cost-effective way of controlling weeds that otherwise persist for years or reduce crop yields. The popularity of glyphosate can be attributed to its effectiveness, safety profile and its contribution to the sustainability of European agriculture while providing significant environmental advantages in terms of reduced carbon emissions and soil erosion.

Within the framework of EU legislation glyphosate is being reviewed to renew its approval for a further 10 years. A number of companies formed the Glyphosate Task Force (GTF) to share the work involved in the renewal process.

Crop Protection in Context

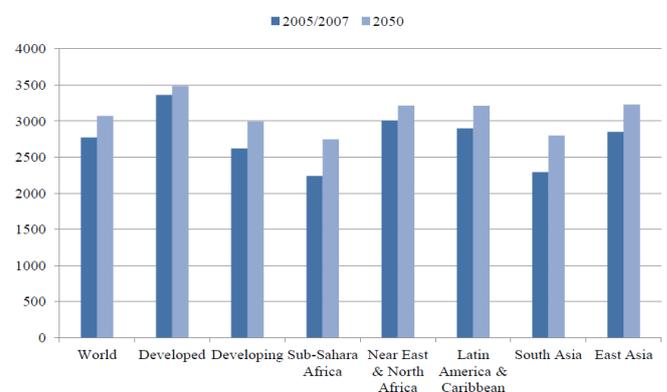
World population increased to 6.9 billion in 2010, up from 3.7 billion in 1970 and is projected to reach 9.15 billion by 2050. Food consumption expressed in kilocalories (kcal) per capita per day is a key variable used for measuring the evolution of the global and regional food situation. World average per capita availability of food improved to 2,770 kcal/person/day in 2005-2007 but because of a range of factors some 2.5 billion live in countries with under 2,500 kcal/person/day and 0.5 billion in countries with less than 2,000 kcal/person/day. It is anticipated that by 2050, some 4.7 billion or 52% of world population may live in countries with national averages of over 3,000 kcal/person/day up from 28% at present, while those living in countries with under 2,500 kcal/person/day may fall from 2.3 billion or 35% at present to 240 million or 2.6% of world population. Achieving such reductions in undernourishment will require that yields continue to rise, that crop losses and food wastage be further reduced and that distribution systems be further improved. The conservation of fertile soils, the development of high-yielding varieties, the protection of crops from losses due to weeds, pests and pathogens, the reduction of food wastage and the improvement of distribution systems are essential elements in sustainable crop production at elevated levels necessary for the elimination of undernourishment.

Agronomic Benefits of Glyphosate

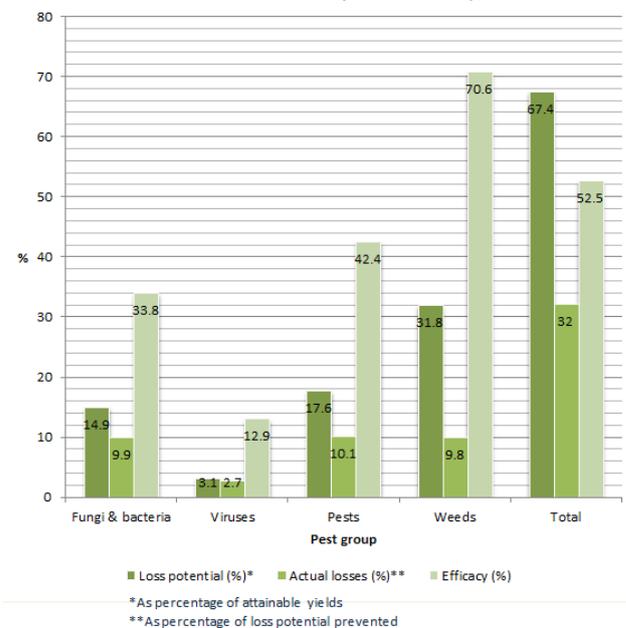
Glyphosate works by blocking the shikimic acid pathway, a metabolic pathway that is essential for plant growth. That pathway is present in all plants, but does not occur in animals, which makes glyphosate a very effective broad-spectrum herbicide and contributes to its low toxicity in animals.

Unlike the many herbicides that act on either grasses or broad leaved weeds, glyphosate is effective on almost all weeds, providing broad-spectrum control. Glyphosate controls weeds that might otherwise persist for several years, competing with crop plants for water, light and nutrients. The application of glyphosate before the new crop is planted

Figure 1.1 Per capita food consumption (kcal/person/day)



Summary of the loss potential and the actual losses due to fungal and bacterial pathogens, viruses, pests and weeds, the efficacy of applied control measures in wheat, rice, maize, barley, potatoes, soybean, sugar beet and cotton in 1996-1998, OEKE and Dehne, 2004



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has the potential to improve harvests by up to 30%-60% for many of Europe's major crops, depending on the weed population and other conditions. Common couch grass, a frequent invader of cereal fields in Europe, can reduce yields up to 60%.

In some countries such as the UK, glyphosate is used as a harvest aid to reduce grain moisture levels, thereby reducing drying costs and accelerating the maturation process of crops like maize, oilseed rape and cereals.

Glyphosate use has facilitated change in farming practices. By chemically controlling a broad spectrum of weeds including their entire root systems, glyphosate has eliminated or reduced the need for ploughing of soils. These reduced tillage practises allow farmers to plant crop seeds directly into stubble fields. A large proportion of Europe's cultivated land is prone to soil erosion and minimal soil disturbance practices are sustainable alternatives that help to protect soil from degradation and reduce greenhouse gas emissions and energy consumption. Several important crops in Europe, including maize, are predominantly managed with these practices in combination with glyphosate making glyphosate a popular tool for farmers in pursuing soil conservation practices.

Glyphosate breaks the "green bridge", removing weeds that might otherwise act as an intermediate host for parasites and disease vectors when crops are emerging. Aphids, for instance, are a common vector of plant viruses such as barley yellow dwarf virus (BYDV) that can destroy up to half of cereal and maize crops. Application of glyphosate removes potential aphid host plants, reducing the risk of virus-carrying aphids transferring from weeds to crop plants when they emerge.

Benefits for Trade

The use of glyphosate has facilitated improvement in crop yields and profitability resulting in the EU being a net exporter rather than a net importer of wheat and coarse grain while it has led to a reduction in the EU import deficit for oilseed and sugar.

Benefits for Consumers and Taxpayers

Glyphosate use continues to contribute to reduced food prices. Had glyphosate not been discovered and developed for use in agriculture, food prices would be higher, taxpayers would be worse off as a result of increased import taxes and more land would be required for food production.

Please refer to www.glyphosate.eu for further information

¹ Garvert H, Schmitz P, Ahmed MA, Agro-economic Analysis of the use of glyphosate in Germany, Justus-Liebig-University of Gießen, Institute of Agricultural Policy and Market Research. Outlook on Pest Management – April 2013

² Alexandratos N, Bruinsma, World Agriculture Towards 2030/2050. The 2012 revision, ESA Working Paper No 12-03, Agriculture development Economics Division, Food and Agriculture Organisation of the United Nations. <http://www.fao.org/docrep/016/ap106e/ap106e.pdf>

³ Oerke EC, Dehne HW, Safeguarding production – losses in major crops and the role of crop protection. Crop Protection 23 (2004) 275-285. <http://www.sciencedirect.com>

⁴ Steinmann HH, Dickeduisberg M, Theuvsen L, Uses and benefits of glyphosate in German Arable Farming. Crop Protection 42 (2012) 164-169



Since its introduction in 1974, glyphosate has been used to control weeds in vineyards, orchards, cereals & many other crops in Europe (© Sarah C./ pixelio.de).



Weeds compete with crops for light, water and nutrients, and as disease vectors for aphids that transmit plant viruses (© Thomas Max Müller/ pixelio.de).

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⁵ Schmitz HCP, Ahmed MN, Garvert H, Hesse JW, Agro-economic analysis of the use of glyphosate in Germany. Institut Für Agribusiness, Senckenbergstrasse 3, 35390 Gießen. ISSN 1434-9787