81 Million People Would Be Without Potatoes If Fungicides Were Not Used in Germany

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Germany ranks 6th in the world in potato production with about 11.8 million tons annually. Potato yields in Germany are double the average world yield. Germany typically exports about 14% of the country’s potato production (1.6 million MT). Fungicides are used on about 95% of Germany’s potato crop every year. The primary target of fungicide sprays on potatoes is the fungus *Phytophthora infestans* which causes the disease known as “late blight.” In northern Germany, where late blight is very severe due to wet conditions, potato fields typically receive 7-10 fungicide applications in a normal year while in the drier southern potato region, 4-7 fungicide applications are normally made [1]. If fungicides were not used in German potato production, average national potato production would decline by 22% [2], equivalent to 2.6 million MT/year. With a global potato consumption of 32 kg per year per capita, the amount that would be produced less in Germany due to the non-use of fungicides would mean an undersupply in the diet of 81 million people.

Late blight of potatoes first appeared on a damaging scale in 1843 in the U.S.A. and spread to Europe in 1845 causing the Great Irish potato famine. In Germany, the disease occurred in numerous regions with production losses of 29-77% [3]. Shortages of potatoes in 1847 had grave social implications and contributed to riots by workers whose wages stagnated while the price of potatoes doubled due to late blight [3]. Between 1850 and 1900, potato yields varied widely in Germany due to uncontrolled late blight with losses being highest in years with wet summers. Real possibilities for the control of late blight first emerged in 1882 with the discovery of the fungicidal activity of a spray of copper sulphate and quicklime (Bordeaux mixture). The first spray trials with Bordeaux mixture for the control of potato late blight occurred in 1886. Research in Germany showed an average yield increase of 19% with a range of 4% to 48% [3]. Spraying with Bordeaux mixture for the control of late blight became an established practice at the turn of the century.

During the 1st World War, all the copper that Germany had was used for shell casings and electric wire with none allocated for making Bordeaux mixture [4]. Heavy rains in 1916 were ideal for late blight, and potatoes rotted in the fields resulting in a reduction of 33% in the German potato crop [5]. The scarcity of potatoes caused starvation and led to the deaths of 700,000 German civilians in the winter of 1916-17 [4]. These civilian deaths greatly weakened the will of the German army. Long-term trials in Germany (forty years) have shown an average yield loss of 20% in potato fields not sprayed with fungicides for late blight control [3]. In severe late blight years, losses in unsprayed potatoes were as high as 63%.

References