

Tragedy of Ireland's great famine (*Phytophthora infestans*) on potato (*Solanum tuberosum* L.)

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Abstract

This paper reviews found the contributions to the economic history of great famine. It provides reliable information about the Irish famine which cause huge losses in the population of Ireland. Around the 20-25% population bring down due to death and emigration. The major permanent change in the country's political, demographic and agricultural landscape. The topic analyzed the huge of Irish deaths and migration of the island. The Irish ate potatoes every day, at every meal and basically, they depended on the potato for nourishment. The major role to cause of famine was the pressure of water mold accidentally arrived from North America and unusually rise in the cool moist weather & continued to destroy potato crops.

Keywords: Famine, population, late blight, loss

Introduction

Potato (*Solanum tuberosum* L.) is an important tuber crop in India and ranks fourth crop in the world after rice, wheat and maize and cultivated as vegetable, food and other edible processed products. It is also known as poor man's friend and king of vegetables. The birth origin from Peru (South America) and family Solanaceae. It is a temperate crop and best temperature for propagation remains relatively lower (15-30°C). Generally, small potato tubers or large tuber cuttings are used as for cultivation of potato (Majeed *et al.* 2017).

Famine is a scarcity, malnutrition and starvation of food caused by several factors including war, crop failure, and population imbalance or government policies. Famine cause millions of "lost" births and had significant effect on physical and mental behavior of human beings. Ireland famine

(1845-51) ranks first and the last major famine in Western European history. More than 1 million who died between 1845 to 1851, the total population of Ireland cut down by between 20-25% and has never since returned to its pre-famine level (Goodspeed *et al.* 2016). The fungus *Phytophthora infestans* cause late blight of potato. From those time period, Irish famine (late blight) became the most harmful disease of potato and it cuts global production of potato by around 15%. In India, it occurs every year in north-western hills of Himachal Pradesh, Uttarakhand, north-eastern hills of Meghalaya and the south Indian hills. It occurs in severe from 3 to 4 years once in the Indo-Gangetic plains comprising states of Punjab, Uttar Pradesh, Bihar and West Bengal, which contributes to about 85-90% of the total potato production in the country and cause huge losses. The yield losses in India due to late blight

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ranges from 19–65% in the eastern hills, 11–74% in North western hills and 10–75% in Eastern plains respectively (Ray *et al.* 2011).

Origin

The origin of late blight (*Phytophthora infestans*) has been controversial topic between researchers or workers suggesting either an Andean origin in South America or central Mexican origin. The disease caused widespread by pathogen first in the U.S. and then migrated to Europe and other parts of the world. The Irish potato famine widespread in various other parts of the world during the 19th century (Dey *et al.* 2018). The fungus could have been transported from Mexico to the United States in foliage or stems of a wild potato due to rapid deterioration of these organs. A few localities in Norway and in Belgium cause potato disease

(*Phytophthora infestans*), was detected in the year 1841 and in 1842, it was observed in at least six countries viz; Belgium, Denmark, England, Germany, Holland, Ireland, and Scotland. It had become a staple food in Ireland by the 18th century, was likeable a hardy and nutritious crop and easy to grow in the Irish soil. In the 19th century Irish famine was worst to occur in Europe (Abad *et al.* 1997).

Symptoms

- * Leaves, stems and tubers are infected.
- * Water soaked spots appear on the leaves, turn purple brown and finally black in colour.
- * White growth develops on under surface of the plant parts.
- * Stem breaks at these points and the plant topples.

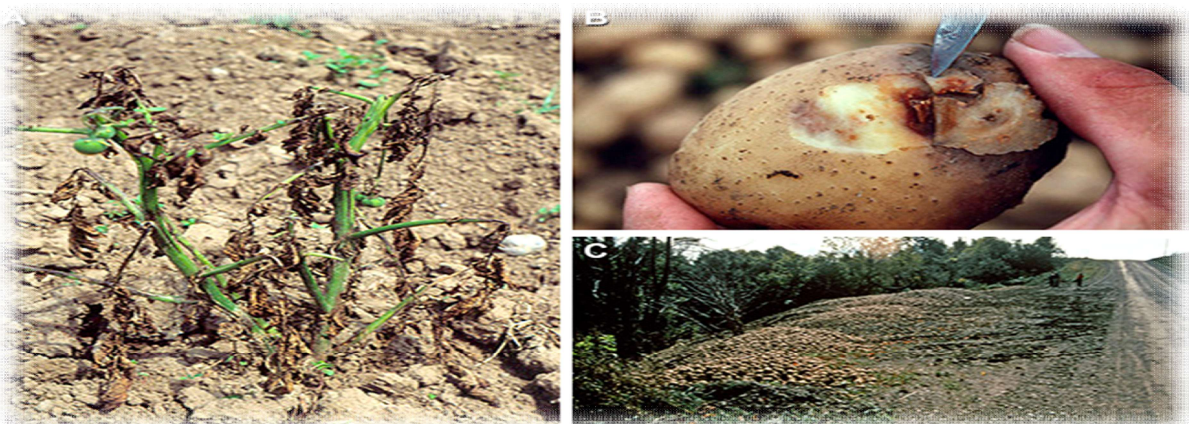


Fig. 1: Symptoms of *Phytophthora infestans* on plant parts

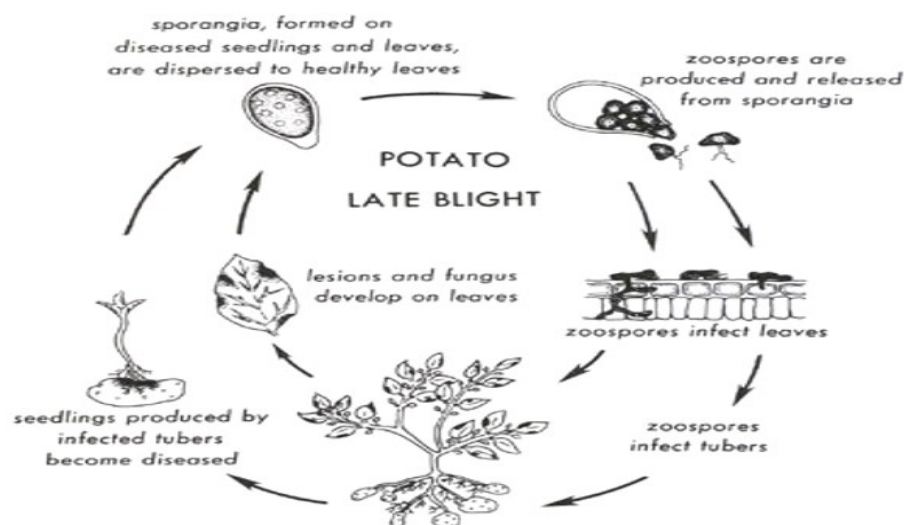


Fig. 2: Life cycle of *Phytophthora infestans*



Fig. 3: Victims of the Irish Potato Famine arriving in Liverpool July, 1850.



Fig. 4: Victims of Ireland's Great Famine (1845–49) immigrating to North America by ship

Impact on Ireland's population:

- * About 1 million of Irish died and another million of people left the island before the famine in 1852. Many died people of hunger or diseased migrated to America with the help of ships.
- * The great famine killed almost one-eighth of population and cause more damage of human life than most modern famines.
- * Some British scientists revealed the famine perceived shortcomings of agriculture and Irish people.
- * Before the famine U.S. had been many of immigrants from Ireland bound for the Colonies but during and after the famine an estimated 1.5 million shifted to the United States. Now at present time, about 35 million U.S. residents claim Irish ancestry.

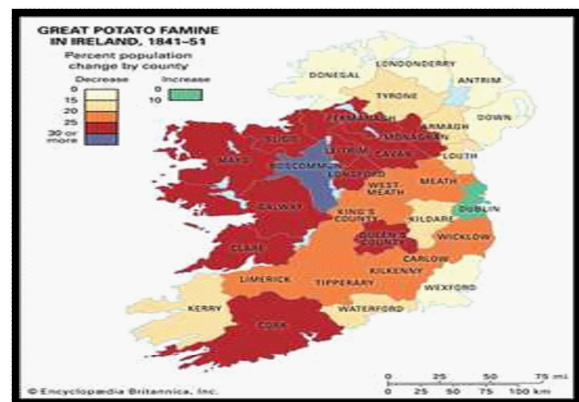


Fig. 5: Population changes in Ireland from 1841 to 1851 as a result of the Great Famine



Fig. 6: Famine memorial in Dublin, Ireland

Conclusion

The Ireland's famine was the natural disaster which was very devastating to the Irish people. Ireland did not produce any grain or livestock during the Irish potato famine. The research reveals about the result many Irish-assets continued to export grain and livestock to England. This is the most important question mark on this conclusion if potato famine could still be going on, even in present day, just think where would we be today without potatoes?

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