

Tobacco and the environment

Introduction

The life cycle of a cigarette takes a heavy toll on the environment from growing the tobacco plant to the disposal of butts and packaging. Although the ecological impacts of tobacco are overshadowed by its devastating effects on human health, they are nevertheless considerable and a cause for concern.

This fact sheet examines the effects tobacco production and cigarette use have on the environment, including deforestation, climate change and pollution.

Tobacco growing and pesticides

Grown as a mono-crop, tobacco plants are vulnerable to many pests and diseases. Consequently, tobacco farmers use large amounts of fertilisers, herbicides and pesticides which can be hazardous to the farmer as well as to the environment. Every year between 1 and 5 million pesticide poisonings are reported which result in the deaths of an estimated 20,000 agricultural workers worldwide.¹

Pesticides commonly used in tobacco production include: imidacloprid, chlorpyrifos, 1,3—dichloropropen, aldicarb, and methyl bromide:

- Imidacloprid is a relatively new pesticide which works by blocking the central nervous system of insects. It is also highly toxic to ants, termites and bees.² According to the US Environmental Protection Agency, imidacloprid has the potential to leach into groundwater.³ In December 2013 the European Commission imposed a 2-year restriction on neonicotinoids including imidacloprid for crops that are attractive to bees and pollinators.⁴
- Chlorpyrifos (CPF) is an organophosphate insecticide which is toxic to humans. It affects the nervous system and high levels of exposure can cause breathing difficulties and paralysis.⁵
- 1,3--Dichloropropen (also known as 1,3—D or Telone) is a highly toxic soil fumigant which causes respiratory problems, skin and eye irritation and is a probable cancer-causing agent.⁶
- Aldicarb is extremely toxic. The acute toxicity of aldicarb is believed to be the highest of any widely used pesticide in the UK and the US.⁷ In the United States it was licensed for use on tobacco plants as recently as 2007⁸ but is due to be phased out by 2018.⁶
- Methyl bromide is an ozone-depleting chemical. It was commonly used to fumigate soil prior to planting tobacco seedlings until the end of the 1990s.⁹ Under the “Montreal Protocol on Substances that Deplete the Ozone Layer” use of this chemical was due to be phased out by 2015.^{10 11}

Environmental laws are often less stringent in low and middle income countries, where the majority of tobacco is grown, and farmers may lack the personal protective equipment or training in the handling of hazardous pesticides.¹² A 2010 study of Pakistani tobacco farmers found that only 30% used shoes, 14% used masks and 9% used gloves during pesticide spraying. Of these farmers, the majority had mild to moderate pesticide poisoning.¹³

The WHO has also expressed concerns about neuropsychiatric effects on tobacco workers who are exposed to organophosphate pesticides. Studies indicate increased rates of anxiety, depression and suicides among tobacco farmers exposed to these chemicals.^{14 15} A study of children working on tobacco farms in Mexico found that children who were exposed to toxic levels of pesticides had high rates of depression and anaemia.¹⁶

Even where laws are in place, tobacco growers are at risk from exposure during the application and storing of the chemicals. Despite laws to protect workers,¹⁷ a 2012 study found that 10.7% of tobacco farmers in Brazil had at least two symptoms of pesticide poisoning.¹⁸

The chemicals in pesticides also leach into the soil and watercourses, contaminating drinking supplies and food chains. Pesticides used in tobacco production have been found in surface and groundwater in the United States and are believed to be responsible for wildlife deaths.^{19 20}

Green tobacco sickness

In addition to the health risks posed by using pesticides, tobacco growers are susceptible to the occupational illness “green tobacco sickness” (GTS). The illness is caused by the absorption of nicotine through the skin from contact with wet tobacco leaves. Symptoms of GTS include headaches, nausea followed by vomiting, weakness, dizziness and abdominal cramps, and occasional fluctuations in blood pressure and heart rates.²¹ A review of 31 studies of health risks associated with tobacco farming found that seasonal prevalence of GTS ranged from 8% to 89%. It reported incidence as 1.9 cases per 100 person days.²² Other studies have found that around a quarter of tobacco pickers have suffered from GTS at least once.^{23 24 25}

Child labour

Children, who make up a significant proportion of tobacco farming workforces, are especially vulnerable to GTS. Not only because their body size is smaller relative to the dose of nicotine absorbed but they lack tolerance to the effects of nicotine.²⁶ A study by children’s rights organisation, Plan, found that children who work as tobacco pickers are particularly prone to GTS and absorb up to 54mg of nicotine a day, causing severe health problems.²⁷

Child labour and nicotine poisoning is also a problem in the developed world. In the US, with parental permission and outside school hours, children aged over 12 years are permitted to work for unlimited hours on tobacco farms. A study carried out by Human Rights Watch in 2013 interviewed children aged between 7 and 17. It found that three quarters reported symptoms consistent with acute nicotine poisoning.²⁸

Tobacco and deforestation

Tobacco farming contributes to both vegetation loss and climate change. Trees are felled both to provide land to grow tobacco and also to provide fuel to dry or “cure” the tobacco leaves. It is estimated that 200,000 hectares of land are cleared each year for the cultivation of tobacco.⁶ The loss of trees, which anchor the soil to their roots, leaves soil vulnerable to erosion which reduces the fertility of the soil, making it more difficult to grow crops.

To preserve tobacco leaves for storage, transport and processing after harvesting they must be cured (dried). “Sun” or “air” curing involves leaving the tobacco to dry naturally which can take several months. Many farmers “flue” cure their tobacco. During this process the leaves are hung and heated air removes water from the leaves. This process takes a week and farmers generally burn wood to heat the air. According to tobacco company Philip Morris International, about 10kg of wood are needed to cure 1kg of tobacco leaves.²⁹

Deforestation has been a particular problem in Tanzania, where approximately 80% of tobacco is flue cured. In the Urambo tobacco-growing region, over 61,000 hectares of land are cleared annually.³⁰ Similarly in Malawi, which devotes more than 5% of its farming land to tobacco, the rate of deforestation is the fourth fastest in the world.³¹

Faced with dwindling sources of wood fuel, the tobacco industry has attempted to address the problem by encouraging tobacco farmers to plant trees as part of reforestation campaigns³¹ and to increase the efficiency of curing systems.³²

Impact on food production

When farmers grow tobacco, less land is available for food crops. This is particularly significant in low and middle income countries. Between 2011 and 2013, 12 of the top 25 tobacco leaf producing countries had high levels of under-nourishment in their populations.³³

Although tobacco growing is rotational and different crops are planted in alternate years, soil in which tobacco has been grown is prone to wind and water erosion making it less suitable for food crops.³⁴ In addition, tobacco plants use more nutrients than many other crops, which leads to further degradation of the soil.³⁵

Under Articles 17 and 18 of the Framework Convention on Tobacco Control, Parties are required to have due regard to the protection of the environment and to promote alternatives to tobacco growing. Policy recommendations were adopted by the 6th Conference of the Parties in November 2014.³⁶

For further information about tobacco and the developing world see: [ASH Fact Sheet: Tobacco and the Developing World](#).

Pollution

The production, consumption and disposal of cigarettes pollutes the environment. The manufacture of cigarettes and cigars creates large quantities of waste in the form of tobacco slurries, solvents, oils, paper, wood, plastics, packaging materials and airborne pollution.³⁷

Cigarette smoke is a known environmental pollutant and classified as a Class A carcinogen by the US Environmental Protection Agency. It also contains small amounts of radioactive material. Lead-210 and polonium-210 are absorbed from the soil by the leaves of the tobacco plant and remain during the curing and manufacturing process. Some phosphate fertilizers favoured by the tobacco industry also contain radioactive materials which contribute to increased radioactive levels in the soil.³⁸ Radiation is not only released into the atmosphere when a cigarette is smoked but leached into soil and waterways from cigarette stubs discarded by smokers.

Discarded cigarette butts are non-biodegradable and they are also the most common form of litter found in beach clean ups.³⁹ It is estimated that around 4 trillion cigarette ends are discarded across the world each year.⁴⁰

As well as being unsightly, cigarette butts are a toxic contaminant, which leach numerous chemicals including heavy metals, nicotine and ethylphenol in water. Discarded butts pose a threat to animals and people, particularly young children if ingested, which is not uncommon.⁴¹

Marine animals are also vulnerable.⁴² Each year thousands of marine mammals, birds and fish are sickened or killed by rubbish, including cigarette litter in the sea.⁴³

This is a growing problem and it is causing significant problems to Britain's beaches. The Marine Conservation Society reported that rubbish from cigarettes and cigarette packaging on Britain's beaches increased by 90% between 2011 and 2012.⁴⁴

In the UK cigarettes are also the principal source of street litter and in 2013 The Local Environmental Quality Survey of England found cigarette butts on 73% of sites surveyed.⁴⁵ A report by the Department of Communities and Local Government Select Committee recommended that the tobacco industry contribute towards the cost of clearing tobacco-related litter and also that it should provide portable ash-trays or bins at the point of sale.⁴⁶

A number of local initiatives have attempted to educate people about the hazards of littering and to change behaviour. An innovative scheme in central London, for example, has helped reduce littering overall by 26%.⁴⁷ In Paris, France, the city government has installed more litter bins, handed out portable ashtrays, and plans to impose large fines on people caught dropping cigarette butts.⁴⁸

Cigarettes and fire risk

Despite the introduction of fire-safer cigarettes which are designed to extinguish more quickly if left unattended, cigarettes and smoking materials remain the primary cause of fatal accidental dwelling fires in Britain. Between April 2013 and March 2014 there were 2,360 house fires in Great Britain which were caused by smokers' materials, resulting in the deaths of 80 people.⁴⁹

Tobacco and climate change

Climate change is gradually increasing the overall temperature of the earth's atmosphere. It is caused by increased levels of carbon dioxide, chlorofluorocarbons and other polluting gases in the atmosphere. These gases are released by the burning of fossil fuels and cutting down of forests. All phases of tobacco production have the potential to contribute to climate change from farming to curing the leaf and the manufacturing process. In a report for the WHO examining alternatives to tobacco growing it was noted that although the global share of agricultural land used for tobacco growing is less than 1%, its impact on global deforestation is 2–4%, making a visible footprint for climate change.⁵⁰

Internal tobacco industry documents released through litigation in the United States revealed that the tobacco industry was involved in initiatives that cast doubt on the evidence supporting climate change and may have hindered progress towards tackling the problem.⁵¹ However, in recent years the major companies have acknowledged the importance of climate change and have engaged with the Carbon Disclosure Project.^{52 53 54}

In 2000, BAT committed to reducing CO₂ emissions from a 2001 baseline of 1.38 TCO₂e (emissions per million cigarettes equivalent). By 2006 this had fallen to 0.79 T Co₂e. In 2006 BAT produced 689 billion cigarettes.⁵⁵ Thus the equivalent output in carbon dioxide was approximately half a million tonnes. According to BAT's 2015 annual report the company has reduced CO₂ emissions by 45% since 2000.⁵⁶

References

- 1 ECLT Foundation. [Understanding, Identifying, and Eliminating Child Labour in Tobacco Growing](#). 2012.
- 2 Rondeau, G et al. [Delayed and time-cumulative toxicity of imidacloprid in bees, ants and termites](#). Scientific Reports 2014; 4.
- 3 Pesticide Action Network UK: [Imidacloprid](#)
- 4 [Bee Health: EU-wide restrictions on Pesticide use to enter into force on 1 December](#). European Commission press release, 24 May 2013
- 5 [Chlorpyrifos general fact sheet](#). National Pesticide Information Centre, 2010
- 6 Eriksen M et al. [The Tobacco Atlas](#). Fifth Edition. Ch5 – Environment. American Cancer Society, 2015
- 7 [Aldicarb](#). Pesticide Action Network.
- 8 US Environmental Protection Agency [Aldicarb Re-registration Eligibility Decision](#) Sept. 2007
- 9 [Pesticides in Tobacco Increase Health Risks](#). Pesticide Action Network North America, 12 May 2006
- 10 United Nations Development Programme. [Montreal Protocol](#)
- 11 United Nations. [Handbook for the Montreal Protocol on substances that deplete the ozone layer](#). 2006.
- 12 Arcury, T. & Quandt, S. [Health and social impacts of tobacco production](#). Journal of Agromedicine 2006; 11: 71–81.
- 13 Khan, D. Shabbir, S. Majid, et al. [Risk assessment of pesticide exposure on health of Pakistani tobacco farmers](#). Journal of Exposure Science and Environmental Epidemiology 2010; 202: 196-204.
- 14 Salvi RM et al. [Neuropsychiatric evaluation in subjects chronically exposed to organophosphate pesticides](#). Toxicological Sciences 2003; 73: 267-271.
- 15 Jamal GA et al. [A clinical neurological, neurophysiological, and neuropsychological study of sheep farmers and dippers exposed to organophosphate pesticides](#). Occupational and Environmental Medicine 2002; 59: 434-441.
- 16 Gamlin J, Diaz Romo P, Hesketh T. [Exposure of young children working on Mexican tobacco plantations to organophosphorus and carbamic pesticides, indicated by cholinesterase depression](#). Childcare Health Development 2007; 33(3):246-8.
- 17 NASDA. [Personal Protective equipment: for agricultural pesticide operators](#): May 2013
- 18 Farria, N. [Acute pesticide poisoning among Brazilian farmers, according to pesticide related symptoms and medical evaluation](#). 30th International Congress on Occupational Health. 2012
- 19 Harned, D. [Pesticides in surface and ground water at four sites of intensive tobacco cultivation in the Piedmont of North Carolina](#): Proceedings of the American Water Resources Association, National Symposium on Water Quality, AWRA TPS-94-4, Chicago, Illinois, November 1994. 275-283.
- 20 North Carolina University Center for Integrated Pest Management. North Carolina Cooperative Extension Service. [Burley Tobacco Guide 2009](#).
- 21 Achalli, S. Shetty, S. Babu, S. [The Green Hazards: A Meta-Analysis of Green Tobacco Sickness](#). International Journal of Occupational Safety and Health 2012; 2: 11-14.
- 22 Schmitt, N. et al. [Health risks in tobacco farm workers – a review of the literature](#). Journal of Public Health 2007; 15: 255-264.
- 23 Wall Street Journal Online. Tackling green tobacco sickness. 24 March 2009.
- 24 Arcury, T. et al. [The incidence of green tobacco sickness among Latino farmworkers](#). Journal of Occupational Environmental Medicine 2001; 43: 601-609.
- 25 Saleeon T et al. [The correlation between pesticide exposure and green tobacco sickness among Thai traditional tobacco farmers in Nan province](#). Journal of Medicine and Medical Sciences 2015 6(5): 82-89
- 26 ECLT Foundation. [Understanding, Identifying, and Eliminating Child Labour in Tobacco Growing](#). 2012.
- 27 Plan. [Hard work, long hours and little pay. Research with children working on tobacco farms in Malawi](#). 2009.
- 28 Human Rights Watch. [Tobacco's hidden children: Hazardous child labour in United States tobacco farming](#). 2014
- 29 Vidal J. [Malawi's forests going up in smoke as tobacco industry takes heavy toll](#). The Guardian 31 July 2015
- 30 Mangora, M. [Shifting Cultivation, Wood Use and Deforestation Attributes of Tobacco Farming in Urambo District, Tanzania](#) Current Research Journal of Social Sciences; 2012. 4 (2): 135-140.
- 31 [The British American Tobacco Biodiversity Partnership](#)
- 32 Corcoran B. Curing Zimbabwe leaf costs too many trees. Tobacco Journal International 3/2015
- 33 Eriksen, M. [The Tobacco Atlas](#). Fifth Edition. Ch15 – Industry. American Cancer Society, 2015
- 34 Lecours, N. Almeida, G. Abdallah, J. & Novotny, T. [Environmental health impacts of tobacco farming: a review of the literature](#). Tobacco control 2011; 21: 191-196.
- 35 World Health Organization. [Study group on economically sustainable alternatives to tobacco growing \(in relation to Articles 17 and 18 of the Convention\)](#). Conference of the parties to the WHO Framework Convention on Tobacco Control, 2008.
- 36 [Policy options and recommendations on economically sustainable alternatives to tobacco growing \(in relation to Articles 17 and 18\)](#). FCTC, Oct. 2014
- 37 Novotny, T. Zhao, F. [Consumption and production waste: another externality of tobacco use](#). Tobacco Control 1999; 8: 75–80.
- 38 [Radiation in tobacco](#). US Environmental Protection Agency.

- 39 Novotny, T. Lum, K. & Barnes, R. [Cigarette butts and the case for an environmental policy on hazardous cigarette waste](#). International Journal of Environmental Research and Public Health 2009; 6: 1691-1705.
- 40 Novotny T. [Time to kick butts - they're toxic trash](#). New Scientist 28 June 2014
- 41 Novotny, T. et al. [Tobacco and cigarette butt consumption in humans and animals](#). Tob Control 2011; (Suppl_1): i17-i20. 20.
- 42 Slaughter, E. et al. [Toxicity of cigarettes butts, and their chemical components, to marine and freshwater fish](#). Tobacco control 2011; 20: 25-29
- 43 Ocean Conservancy. [International coastal clean-up 2015 report](#).
- 44 Marine Conservation Society. [Our passion for plastic is leaving a legacy of litter on Britain's beaches](#). May 2013
- 45 Keep Britain Tidy. [How clean is England? The Local Environmental Quality Survey of England 2013/14](#). 2014
- 46 [Report: Litter and fly-tipping in England](#). DLCG Select Committee. 14 March 2015
- 47 [Westminster tackles cigarette & gum litter with innovative behaviour change campaign](#). edie.net 10 Sept. 2015
- 48 [Dropping a cigarette butt in Paris to prompt €68 fine](#). France 24.com 4 Sept. 2015
- 49 [Fire Statistics Great Britain April 2013 - March 2014](#). Dept. for Communities and Local Government. 2015
- 50 World Health Organization. [Study group on economically sustainable alternatives to tobacco growing \(in relation to Articles 17 and 18 of the Convention\): Provisional agenda item 4.8 \(FCTC/COP/3/11\)](#). 2008
- 51 Monbiot, G. [The denial industry](#). The Guardian, 19 September 2006
- 52 [British American Tobacco recognised for Climate Change Disclosure](#). BAT press release, 11 Oct. 2012
- 53 Imperial Tobacco plc. [Carbon Disclosure Project – Feedback Summary 2014](#)
- 54 [PMI CDP 2012 Investor Information Request](#).
- 55 [Our strategy in action: Responsibility](#). BAT Annual Review and Summary Financial Statement 2006
- 56 [Environmental Performance](#). BAT, 2015.