

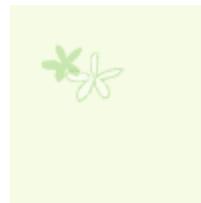
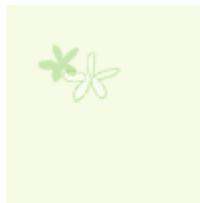
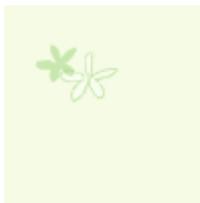
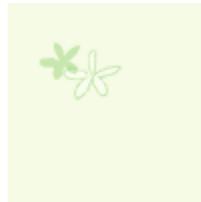
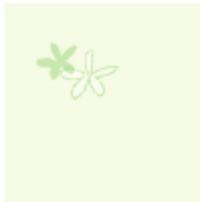
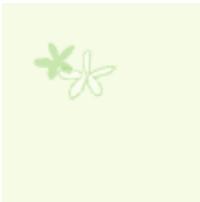


Stockholm Convention on
Persistent Organic Pollutants
(POPs)

Endosulfan

An introduction to the chemical added to the
Stockholm Convention at the fifth meeting of
the Conference of the Parties

2011



This booklet provides basic information on **endosulfan** and on implications of listing a new chemical under the **Stockholm Convention on Persistent Organic Pollutants (POPs)**.

In accordance with the procedure laid down in **Article 8** of the Convention, the **POPs Review Committee (POPRC)** reviewed the proposal submitted by a Party for listing endosulfan under the Convention and recommended that endosulfan should be considered by the Conference of the Parties for listing in **Annex A** of the Convention. The results of the Committee's review are documented in the **Risk Profile** and **Risk Management Evaluation** for endosulfan, available for download from the Convention's website (www.pops.int/poprc)

At its fifth meeting held from 25 to 29 April 2011, the Conference of the Parties considered the Committee's recommendation and decided to list endosulfan under Annex A with specific exemptions. The text of this decision is contained in decision SC-5/3 (www.pops.int).

Reference:

- Risk profile on endosulfan - UNEP/POPS/POPRC.5/10/Add.2
- Risk management evaluation on endosulfan - UNEP/POPS/POPRC.6/13/Add.1

Please contact the Secretariat for more information: ssc@pops.int

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Introduction

What are “POPs”?

Persistent organic pollutants (POPs) are organic compounds that are resistant to environmental degradation through chemical, biological, and photolytic processes.

POPs **persist** in the environment for long periods, are capable of **long-range transport**, **bioaccumulate** in human and animal tissue, **biomagnify** in food chains, and have **potentially significant impacts** on human health and the environment.

Exposure to POPs can cause serious health problems including certain cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to disease and even diminished intelligence.

Stockholm Convention on POPs

The **Stockholm Convention** is a global treaty to protect human health and the environment from POPs. It entered into force in 2004 and initially covered 12 chemicals. Currently, 171 countries and one regional economic integration organization are Parties to the Stockholm Convention.

POPs Review Committee (POPRC)

The **POPRC** consists of 31 government-designated experts in areas of chemical assessment or management from all the United Nations regions. The Committee **reviews proposals** submitted by Parties to the Convention for listing new chemicals in accordance with **Article 8** of the Convention.

Listing of POPs

The control measures that must be taken by Parties are classified by the Annex in which chemical substances are listed:

Annex A: Parties must take measures to **eliminate** the production and use of the chemicals listed under Annex A. Specific exemptions for use or production are listed in the Annex and apply only to Parties that register for them.

Annex B: Parties must take measures to **restrict** the production and use of the chemicals listed under Annex B in light of any applicable acceptable purposes and/or specific exemptions listed in the Annex.

Annex C: Parties must take measures to reduce the **unintentional release** of chemicals listed under Annex C with the goal of continuous minimization and, where feasible, ultimate elimination.

When chemicals are listed, Parties need to:

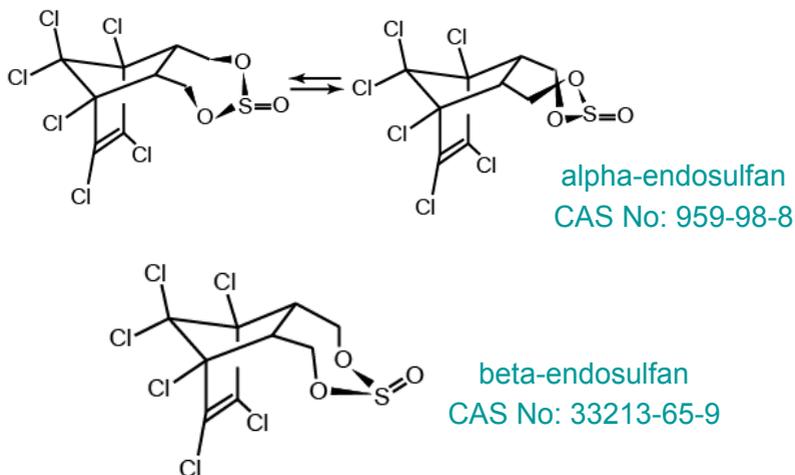
- Implement control measures for each chemical (Article 3);
- Develop and implement action plans for unintentionally produced chemicals (Article 5);
- Develop inventories of the chemicals' stockpiles (Article 6);
- Review and update the National Implementation Plan (Article 7);
- Include the new chemicals in the reporting (Article 15);
- Include the new chemicals in the programme for the effectiveness evaluation (Article 16).

Endosulfan

Listed in Annex A with specific exemptions

Chemical identity and properties

Endosulfan occurs as two isomers: alpha- and beta-endosulfan. They are both biologically active. Technical endosulfan (CAS No: 115-29-7) is a mixture of the two isomers along with small amounts of impurities.



POPs characteristics of endosulfan

According to the risk profile on endosulfan, adopted by the POPRC, endosulfan is persistent in the atmosphere, sediments and water. Endosulfan bioaccumulates and has the potential for long-range transport. It has been detected in air, sediments, water and in living organisms in remote areas, such as the Arctic, that are distant from areas of intensive use.

Endosulfan is toxic to humans and has been shown to have adverse effects on a wide range of aquatic and terrestrial organisms. Exposure to endosulfan has been linked to congenital physical disorders, mental retardations and deaths in farm workers and villagers in developing countries in Africa, Asia and Latin America. Endosulfan sulfate shows toxicity similar to that of endosulfan.

Use and production

According to the risk management evaluation on endosulfan, adopted by the POPRC, endosulfan is an insecticide that has been used since the 1950s to control crop pests, tsetse flies and ectoparasites of cattle and as a wood preservative. As a broad-spectrum insecticide, endosulfan is currently used to control a wide range of pests on a variety of crops including coffee, cotton, rice, sorghum and soy.

A total of between 18,000 and 20,000 tons of endosulfan are produced annually in Brazil, China, India, Israel and South Korea. Colombia, the United States of America and several countries in Europe that used to produce endosulfan have stopped its production.

The largest users of endosulfan (Argentina, Australia, Brazil, China, India, Mexico, Pakistan and the United States) use a total of about 15,000 tons of endosulfan annually. An additional 21 countries report using endosulfan. The use of endosulfan is banned or will be phased out in 60 countries that, together, account for 45 per cent of current global use.

SC-5/3: Endosulfan

The Conference of the Parties,

[...]

1. Decides to amend part I of Annex A to the Stockholm Convention on Persistent Organic Pollutants to list therein technical endosulfan and its related isomers, with specific exemptions for production as allowed for the parties listed in the Register of Specific Exemptions and/or for use on crop-pest complexes as listed in accordance with the provisions of a new part VI of the annex by inserting the following row:

Chemical	Activity	Specific exemption
Technical endosulfan* (CAS No: 115-29-7) and its related isomers* (CAS No: 959-98-8 and CAS No: 33213-65-9)	Production	As allowed for the parties listed in the Register of Specific Exemptions
	Use	Crop-pest complexes as listed in accordance with the provisions of part VI of this Annex

2. Decides to insert a new note (v) in part I of Annex A as follows:

Technical endosulfan (CAS No: 115-29-7), its related isomers (CAS No: 959-98-8 and CAS No: 33213-65-9) and endosulfan sulfate (CAS No: 1031-07-8) were assessed and identified as persistent organic pollutants.

3. Decides to insert a new Part VI in Annex A as follows:

Part VI

Technical endosulfan and its related isomers (endosulfan)

The production and use of endosulfan shall be eliminated except for parties that have notified the Secretariat of their intention to produce and/or use it in accordance with Article 4 of the Convention. Specific exemptions may be available for the use of endosulfan for the following crop-pest complexes:

Crop	Pest
Apple	Aphids
Arhar, gram	Aphids, caterpillars, pea semilooper, pod borer
Bean, cowpea	Aphids, leaf miner, whiteflies
Chilli, onion, potato	Aphids, jassids
Coffee	Berry borer, stem borers
Cotton	Aphids, cotton bollworm, jassids, leaf rollers, pink bollworm, thrips, whiteflies
Eggplant, okra	Aphids, diamondback moth, jassids, shoot and fruit borer
Groundnut	Aphids
Jute	Bihar hairy caterpillar, yellow mite
Maize	Aphids, pink borer, stem borers
Mango	Fruit flies, hoppers
Mustard	Aphids, gall midges
Rice	Gall midges, rice hispa, stem borers, white jassid
Tea	Aphids, caterpillars, flushworm, mealybugs, scale insects, smaller green leafhopper, tea geometrid, tea mosquito bug, thrips
Tobacco	Aphids, oriental tobacco budworm
Tomato	Aphids, diamondback moth, jassids, leaf miner, shoot and fruit borer, whiteflies
Wheat	Aphids, pink borer, termites

Alternatives to endosulfan

Alternatives to endosulfan

The Conference of the Parties decided to undertake a work programme to support the development and deployment of alternatives to endosulfan, as set out in the annex to decision **SC-5/4**. The POPRC was tasked to assess the alternatives to endosulfan and report to the Conference of the Parties at its sixth meeting.

Chemical and non-chemical alternatives to endosulfan are known and available in many geographical situations both in developed and developing countries. Those alternatives are applied in countries where endosulfan has been banned or is being phased-out. However, in some countries, it has been difficult to replace endosulfan for certain crop-pest complexes. Endosulfan was preferred in pollinator management, insecticide resistance management, integrated pest management systems due to its effectiveness against a broad range of pests.

Some examples of alternatives reported by Parties and observers are listed below:

Chemical alternatives: malathion (used in Sahelian countries against the cotton bollworm on cotton); cyromazin (used in Canada against the Colorado potato beetle on potato); bifenthrin (used in China against white fly on tea).

Non-chemical alternatives: *Bacillus thuringiensis* (bacterium used in Canada against the diamondback moth on cauliflower); *Metarhizium flavoviride* (fungus used in West Africa against locusts on rice and wheat); *Phymastichus coffea* (wasp used in Mexico and Costa Rica against the coffee berry borer on coffee).

The 22 POPs

Annex A (Elimination)

Aldrin, Alpha hexachlorocyclohexane,
Betahexachlorocyclohexane, Chlordane, Chlordecone,
Dieldrin, Endrin, Heptachlor, Hexabromobiphenyl,
Hexabromodiphenyl ether and heptabromodiphenyl ether*,
Hexachlorobenzene, Lindane*, Mirex, Pentachlorobenzene,
Polychlorinated biphenyls (PCB)*,
Technical endosulfan and its isomers*,
Tetrabromodiphenyl ether and pentabromodiphenyl ether*,
Toxaphene

*Listed with specific exemptions.

Annex B (Restriction)

DDT**,
Perfluorooctane sulfonic acid (PFOS), its salts and
perfluorooctane sulfonyl fluoride (PFOSF)**

**Listed with specific exemptions and acceptable purposes

Annex C (Unintentional production)

Hexachlorobenzene (HCB),
Pentachlorobenzene (PeCB), Polychlorinated biphenyls (PCB),
Polychlorinated dibenzo-*p*-dioxins and dibenzofurans
(PCDD/PCDF)

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