

**Formal Recommendation**  
**From: National Organic Standards Board (NOSB)**  
**To: the National Organic Program (NOP)**

**Date:** April 2015

**Subject:** Petition to add Exhaust Gas (carbon monoxide) at §205.601

**NOSB Chair:** Jean Richardson

**The NOSB hereby recommends to the NOP the following:**

Rulemaking Action:

Guidance Statement:

Other: X

**Statement of the Recommendation (Motion #1):**

Motion to classify Exhaust Gas as synthetic, passed

**Statement of the Recommendation (Motion #2):**

Motion to list Exhaust Gas at §205.601, as a synthetic substance allowed for use in organic crop production, failed

**Rationale Supporting Recommendation (including consistency with OFPA and Organic Regulations):**

Based on the failure to satisfy the OFPA criteria, specifically concerns about potential impacts on non-target species of vertebrates, invertebrates and microorganisms, especially threatened and endangered species as well as potential effects on soil microorganisms, the NOSB recommends that Exhaust Gas not be added to the National List.

**Committee Vote:**

Motion to classify Exhaust Gas as synthetic

Moved: Francis Thicke

Second: Harold Austin

Yes: 14 No: 0 Abstain: 0 Absent: 1 Recusal: 0

Motion passed

Motion to list Exhaust Gas at §205.601, as a synthetic substance allowed for use in organic crop production

Moved: Francis Thicke

Second: Harold Austin

Yes: 0 No: 14 Abstain: 0 Absent: 1 Recusal: 0

Motion failed

**National Organic Standards Board  
Crops Subcommittee  
Petitioned Material Proposal & Checklist - Exhaust Gas  
December 16, 2014**

**Summary of Proposed Action:**

Exhaust gas from internal combustion engines has been petitioned for use for control of burrowing rodents, under §205.601 Synthetic substances allowed for use in organic crop production. Exhaust gas contains carbon monoxide, which diminishes the oxygen-carrying capacity of red blood cells in the target rodents, and carbon dioxide, which displaces oxygen from the atmosphere of the burrow, leading to asphyxiation of the rodent. The Crops Subcommittee did not support this petition because of concerns about potential impacts on non-target species, especially threatened and endangered species as well as potential effects on soil microorganisms.

**Background:**

The original petition was for "Carbon Monoxide" and was sent to the NOP on 4/19/12. The Crops Subcommittee found the petition incomplete on 12 04 12 and asked the petitioner for additional information. The petitioner submitted a petition addendum on 2 22 13. The petition was determined sufficient by the Crops Subcommittee on 1 21 14. A technical review of exhaust gas for use as a rodenticide was received October 2014.

In an April 2011 sunset review, sulfur dioxide for use as a rodenticide failed to be relisted by a vote of 9 to 0 and was taken off the National List. In December 2011 a petition to add propane gas to the National List as a rodenticide was denied by a vote of 0 in favor and 14 opposed.

**Evaluation Criteria (see attached checklist for criteria in each category)**

1. Impact on Humans and Environment
2. Essential & Availability Criteria
3. Compatibility & Consistency

**Criteria Satisfied?**

- |                              |  |                              |
|------------------------------|--|------------------------------|
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A |

**Substance Fails Criteria Category:** 1, 2, 3

**Subcommittee Action & Vote**

**Classification Motion:** Move to classify Exhaust Gas as synthetic

Motion by: Francis Thicke

Seconded by: Harold Austin

Yes: 5 No: 0 Abstain: 0 Absent: 2 Recuse: 0

**Listing Motion:** Move to list Exhaust Gas at §205.601 Synthetic substance allowed for use in organic crop production.

Motion by: Francis Thicke

Seconded by: Harold Austin

Yes: 0 No: 5 Absent: 2 Abstain: 0 Recuse: 0

**Proposed Annotation (if any):** none

**NOSB Evaluation Criteria for Substances Added To the National List – Crops**

**Category 1. Adverse impacts on humans or the environment?**

**Substance: Exhaust Gas**

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is there a probability of environmental contamination during use or misuse? [§6518(m)(3)]	X			TR lines 299-302: “High volume releases of exhaust gases to the atmosphere are associated with a variety of adverse environmental impacts. Specifically, exhaust gas emissions contribute to air pollution, and four of its components (particulate matter, carbon monoxide, nitrogen oxides and sulfur dioxide) are criteria pollutants according to US EPA (2012).
2. Is there a probability of environmental contamination during, manufacture or disposal? [§6518(m)(3)]	X			Exhaust gas is “manufactured” by the burning of fuel in internal combustion engines. As noted in #1 above, the manufacture of exhaust gas contributes to air pollution.
3. Are there any adverse impacts on biodiversity? (§205.200)	X			If other animals are present in the rodent burrows, they could also be affected: TR 353-354: “Non-target animals may also dwell underground and be exposed to exhaust gas following its release in the treated area. Potentially affected non-target animals include other mammals, birds, reptiles, amphibians, invertebrates (e.g., bumble bees and earthworms), slugs, snails, protozoa and nematodes.”  The TR (lines 354-355) states “Limited data is available regarding the effects of exhaust gas on soil organisms.”
4. Does the substance contain inerts classified by EPA as ‘inerts of toxicological concern’? [§6517(c)(1)(B)(ii)]		X		
5. Is there potential for detrimental chemical interaction with other materials used in organic farming systems? [§6518(m)(1)]		X		TR lines 337-338: “no interactions between exhaust gas or its component chemicals and other common substances used in agriculture were identified.”

6. Is there a toxic or other adverse action of the material or its breakdown products? [§6518(m)(2)]	X		The CO is toxic (as it is intended to be). Long-term inhalation of exhaust gas can be harmful to health (TR lines 259-269). When exhaust gas is injected into rodent burrows the exposure to humans would be minimal, but there would be exposure of toxic compounds to non-target organisms, as noted in #3 above.
7. Is there persistence or concentration of the material or breakdown products in the environment? [§6518(m)(2)]	X		The exhaust gases that escape the rodent burrow after treatment disperse into the atmosphere where they are subject to many chemical transformations in the atmosphere (TR lines 219-254). TR lines 225-227: "CO <sub>2</sub> can be long-lived in the atmosphere, with half-lives ranging from five to 200 years, depending on the model parameters (IPCC, 2001; Moore, 1994)."  In the soil, CO can be converted to CO <sub>2</sub> by soil microorganisms (TR line 224). Information is not available on other possible reactions in the soil.
8. Would the use of the substance be harmful to human health or the environment? [§6517 (c)(1)(A)(i); §6517 (c)(2)(A)(i); §6518(m)(4)]		X	Similar to, or less than, being around standard vehicles with internal combustion engines.
9. Are there adverse biological and chemical interactions in the agro-ecosystem? [§6518(m)(5)]		X	TR lines 337-338: "no interactions between exhaust gas or its component chemicals and other common substances used in agriculture were identified."
10. Are there detrimental physiological effects on soil organisms, crops, or livestock? [§6518(m)(5)]	X		TR lines 352-355: "Non-target animals may also dwell underground and be exposed to exhaust gas following its release in the treated area. Potentially affected non-target animals include other mammals, birds, reptiles, amphibians, invertebrates (e.g., bumble bees and earthworms), slugs, snails, protozoa and nematodes. Limited data is available regarding the effects of exhaust gas on soil organisms."

## NOSB Evaluation Criteria for Substances Added To the National List - Crops

### Category 2. Is the Substance Essential for Organic Production?      Substance: Exhaust Gas

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is the substance agricultural? [§6502(1)]		X		
2. Is the substance formulated or manufactured by a chemical process? [§6502(21)]	X			It is “manufactured” by burning liquid fuel in an internal combustion engine.
3. Is the substance formulated or manufactured by a process that chemically changes a substance extracted from naturally occurring plant, animal, or mineral sources? [§6502(21)]		X		
4. Is the substance created by naturally occurring biological processes? [§6502(21)]		X		
5. Is there a natural source of the substance? [§ 205.600(b)(1)]		X		
6. Is there an organic substitute? [§205.600(b)(1)]		X		
7. Is there a wholly natural substitute product? [§6517(c)(1)(A)(ii)]		X		
8. Are there any alternative substances? [§6518(m)(6)]	X			Vitamin D3 is on the National List §205.601(g). Vitamin D3 (cholecalciferol) produces hypercalcemia (i.e., excessive levels of calcium in the blood). Rodents generally die within two days following ingestion of a lethal dose (TR 473-474).
9. Are there other practices that would make the substance unnecessary? [§6518(m)(6)]	X			Traps, barriers, natural predation, and other physical control methods can be used (TR lines 505-554).

## NOSB Evaluation Criteria for Substances Added To the National List - Crops

### Category 3. Is the substance compatible with organic production practices? Substance: Exhaust Gas

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is the substance consistent with organic farming and handling? [§6517(c)(1)(A)(iii); 6517(c)(2)(A)(ii)]		X		Internal combustion engines are used in organic farming. However, injecting exhaust gases into the soil profile is not a standard kind of practice in organic farming.
2. Is the substance compatible with a system of sustainable agriculture? [§6518(m)(7)]		X		Internal combustion engines are used in sustainable farming systems. However, injecting exhaust gases into the soil profile might be considered contrary to sustainable agriculture
3. If used in livestock feed or pet food, Is the nutritional quality of the food maintained with the substance? [§205.600(b)(3)]			X	
4. If used in livestock feed or pet food, Is the primary use as a preservative? [§205.600(b)(4)]			X	
5. If used in livestock feed or pet food, Is the primary use to recreate or improve flavors, colors, textures, or nutritive value lost in processing (except when required by law)? [§205.600(b)(4)]			X	
6. Is the substance used in production, and does it contain an active synthetic ingredient in the following categories: [§6517(c)(1)(B)(i);		X		There can be small amounts of sulfur compounds in exhaust gas, but they are not active ingredients.
copper and sulfur compounds				
toxins derived from bacteria		X		
pheromones, soaps, horticultural oils, fish emulsions, treated seed, vitamins and minerals		X		
livestock parasiticides and medicines		X		
production aids including netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleansers		X		