

**PETITION TO THE NATIONAL ORGANIC STANDARDS BOARD  
TO REMOVE ALLOWANCE FOR CROP USE OF SODIUM NITRATE  
December 14, 2001**

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**Category Being Petitioned:** 7 CFR 205.602 (h)

Sodium nitrate is currently on the National List in section 205.602 as a nonsynthetic substance prohibited for use in organic crop production, with a restriction that allows use if the use is restricted to no more than 20% of the crop's total nitrogen requirement. This petition asks that this annotation be removed, so that all crop use of sodium nitrate shall be prohibited in organic agriculture.

**1. The substance's common name.**

Sodium nitrate is available in a synthetic form or from mined sources. The mined form is also known as Chilean nitrate, nitrate of soda or soda niter. The chemical formula for either form is  $\text{NaNO}_3$ .

**2. The manufacturer's name, address and telephone number.**

Basic producers listed in the Farm Chemicals Handbook<sup>1</sup> include; PCS Sales, 5750 Old Orchard Road, Ste 440, Skokie IL 6007, and Sinochem Tianjim Import & Export, Corp. Tianjian 300042 China

Primary producer of the Chilean mined sources is Chilean Nitrate Corporation, a division of SQM North America, 3101 Tower creek Parkway, Ste. 450 Atlanta GA 30339, 770-916-9400 [www.sqm.com](http://www.sqm.com)

**3. The intended or current use of the substance such as use as a pesticide, animal feed additive, processing aid, nonagricultural ingredient, sanitizer or disinfectant.**

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<sup>1</sup> Meister R., 2000. Farm Chemicals Handbook. P. E13. Meister Publishing, Willoughby, OH

This material is currently allowed for use as a nitrogen fertilizer, with a restriction on the amount used per crop.

- 4. A list of the crop, livestock or handling activities for which the substance will be used. If used for crops or livestock, the substance's rate and method of application must be described. If used for handling (including processing), the substance's mode of action must be described.**

This material is currently permitted for all crop use under the USDA National Organic Program.

- 5. The source of the substance and a detailed description of its manufacturing or processing procedures from the basic component(s) to the final product.**

Synthetic forms are manufactured by reacting nitric acid with either sodium carbonate or sodium chloride.

The most important deposits are found in Chile, as part of large salt deposits. (Tisdale<sup>2</sup>). They occur on the eastern slope of the coastal range at elevations between 4,000 and 7500 feet. Mining involves removing the salts by blasting the ore, which is found only a few feet from the surface of the ground. The raw ore is crushed, moved to a refinery, and extracted with a hot water solution. The stepwise extraction recovers a refined product that is 96% NaNO<sub>3</sub>, which is then dried and prilled. It contains some trace elements as well.

- 6. A summary of any available previous reviews by State or private certification programs or other organizations of the petitioned substance.**

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<sup>2</sup> Tisdale S., W. L. Nelson. 1975. Soil Fertility and Fertilizers. Macmillan Publishing Co. NY.

Sodium nitrate was reviewed by the NOSB in 1995, and they voted to allow its use with restrictions as detailed in Addendum Number 27.<sup>3</sup> This addendum calls for restrictions that also include a requirement for specific farm plan documentation, including strategies for substantial reduction in use over time. The Farm Plan was also supposed to explore “each and every alternative to the routine use of Chilean Nitrate...timing and efficiency for Chilean Nitrate applications shall be optimized.” This addendum further called for review of this decision in two years. Despite this allowance, many US certification agencies did not allow use of this material prior to the final publication of the USDA rule. European Union regulations do not allow it, nor does IFOAM, the Japanese Agricultural Standards (JAS) or CODEX. US certifiers that prohibited use include OCIA, FVO, NOFA-NY, MOFGA, NOFA-VT, NOFA-NJ, NOFA-Mass, and Oregon Tilth Certified Organic. The Organic Trade Association’s American Organic Standards<sup>4</sup> recommended sodium nitrate be phased out by Jan. 1, 2003, and Washington State Department of Agriculture also adopted a 2003 phase out date. Producers currently shipping products to Europe or Japan must have their certifiers verify in addition to their normal certification, that they did not use Chilean nitrate.

**7. Information regarding EPA, FDA, and State regulatory authority registrations, including registration numbers.**

DOT Number: NA 1487 Oxidizer; UN 1498 Oxidizer; UN 1499  
RTECS: WC5600000 EPA PC Code 076104

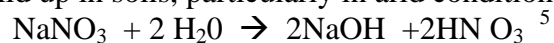
**8. The Chemical Abstract Service (CAS) number or other product numbers of the substance and labels of products that contains the petitioned substance.**

CAS # 7631-99-4 ACX Number X1000128-4

**9. The substance's physical properties and chemical mode of action including (a) chemical interactions with other substances, especially substances used in organic production; (b) toxicity and environmental persistence; (c) environmental impacts from its use or manufacture; (d) effects on human health; and, (e) effects on soil organisms, crops, or livestock.**

Sodium nitrate is a highly soluble, colorless, sodium salt. It consists of transparent or white crystals. Specific gravity, 2.26, melting point 306 C. Strong oxidizer.

- a) Sodium nitrate is a highly soluble nitrogen fertilizer, and is subject to leaching into ground water. In the soil the salt reacts with water to release soluble nitrate, which is readily absorbed by plants or leached into the ground water, and sodium – which can build up in soils, particularly in arid conditions.



- b) & c) Potential build up of salts in soils. Contaminants in the mined material are of concern, see number 11.

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<sup>3</sup> NOSB. 1995. Final Recommendation Addendum No. 27. Chilean Nitrate Special Use Guidelines, in “Toward Organic Integrity,” M. Sligh, Ed. 1997. page 176. Rural Advancement Foundation Intl. Pittsboro, NC.

<sup>4</sup> OTA. 2000 American Organic Standards. www.ota.com

<sup>5</sup> Parnes, R. 1990. Fertile Soil, A Grower’s Guide to Organic and Inorganic Fertilizers.p. 163 AgAccess, Davis CA

- d) Not a carcinogen. The MSDS reports only slight health hazards, an irritant that is harmful if swallowed or inhaled. It is highly reactive, a strong oxidizer.
- e) Excess applications of soluble nitrogen reduce the activity of soil microorganisms that fix nitrogen. An imbalance in the ratio of carbon sources to nitrogen will also limit microbial activity in the soil that is part of a sustainable nitrogen cycle.<sup>6</sup> A 1989 review by the IFOAM technical committee cited a number of studies showing substantial reduction in earthworm population after application of sodium nitrate.<sup>7</sup> The OFPA criteria of 6518(m)(5) also specifically request information regarding the salt index of a substance, as this is a measure of effects on soil organisms and plants. The salt index is a measure of the relative tendency of a fertilizer to increase the osmotic pressure of the soil solution as compared to sodium nitrate, which is so soluble that it is considered the reference material. Sodium nitrate is rated as 100 in the salt index reference scale (which rates from 0-100 per equal weight of fertilizer material). The lower the salt index, the lesser the risk of causing crop injury due to excess concentrations of soluble salts in the soil solution.<sup>8</sup>

## **10. Safety information about the substance including a Material Safety Data Sheet (MSDS) and a substance report from the National Institute of Environmental Health Studies.**

MSDS available: [http://www.skylighter.com/msds/sodium\\_nitrate.txt](http://www.skylighter.com/msds/sodium_nitrate.txt).

## **11. Research information about the substance.**

A recent report by Urbansky, et. al<sup>9</sup> of US EPA describes the problem of natural contamination of mined Chilean sodium nitrate with the perchlorate anion (ClO<sub>4</sub><sup>-</sup>). Perchlorate interferes with iodide uptake in the thyroid gland, and has been discovered in a number of US water supplies in 1997, including Lake Mead and the Colorado River. Perchlorate in drinking water is difficult to treat. The EPA has added this species to the Contaminant Candidate List for drinking water and is in the process of assessing occurrence more widely. The authors found levels of perchlorate in the Chilean nitrate to range from 0.7-2.0 mg/g depending on the lot. They suggest further research and more specific guidelines for application of Chilean nitrate that are framed within characteristics of a site-specific watershed or ecosystem. They noted that use of this fertilizer is highly localized in some areas.

## **12. A Petition Justification Statement**

As noted by the NOSB in November of 1995, many alternatives exist to sodium nitrate for providing the nitrogen needs of organic crops. These include compost, leguminous cover crops, interplanting with legumes, rotations involving legumes, animal manures, plant and animal sources of nitrogen, varietal selection, and planting date alterations. These alternatives

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<sup>6</sup> Ibid. p.10, 72-73.

<sup>7</sup> Edwards, C. A. and J.R. Lofty, 1975. Biology of the Earthworm, 2<sup>nd</sup> Ed. Cited by IFOAM, 1989. Chilean Nitrate, an Evaluation for its use, respectively its non-use in Organic Agriculture. The Recommendations of the Technical Committee.

<sup>8</sup> Meister. R. 2000. Farm Chemicals Handbook. p. B35.

<sup>9</sup> Urbansky, E.T., S.K.Brown, M.L. Magnuson, C.A. Kelty. 2001. Perchlorate levels in samples of sodium nitrate fertilizer derived from Chilean caliche. Environmental Pollution 112: 299-302.

exist today, and a large number of commercial organic farmers have developed production systems that do not depend on this mined material. It is also in the interest of US farmers to consider harmonizing the US standards with international norms in order to facilitate trade. In light of the new information about water contamination, and the NOSB stated desire in 1995 to review this material in two years, we request this material be considered for removal as an allowed use in organic production.

Sodium nitrate use is not compatible with good organic management of a farm. Allowing the use of this material on organic farms will encourage cropping systems that do not make sound use of a farm's resources. Research done by William Albrecht showed that when sodium nitrate was used to grow crops, both soil organic matter quantity and quality were reduced compared to when manure or cover crops supplied the needed nitrogen. If an organic farm regularly has a "need" for purchased nitrate nitrogen, it indicates a basic problem in crop management that should be addressed by the long term organic management plan rather than with potentially harmful inputs. Protein meals can supply nitrogen to the crop as effectively as sodium nitrate without the negative effects on the soil health, though even protein meals should not be seen as a substitute for managing soil biological activity to provide most crop fertility needs.

## **12. A Commercial Confidential Information Statement**

None.