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Methods to Protect Global Warming

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Abstract

The promotion of growth of plant and promotion of carbon dioxide assimilation are best methods to protect global warming. Plant growth by eating carbon dioxide, nutrient N and nutrient P. Supply of N and P is key point. Elimination process of Nitrogen oxide (NOx) at automobile exhaust gas and power station flue gas should be stopped. Elimination of phosphate, urea and ammonium salt in drainage should be stopped. By the supply of sufficient N and P, enough growth of plant and enough carbon dioxide assimilation are performed. Then increased absorption of carbon dioxide and heat will protect global warming.

Keywords: Nitrogen oxide; NOx; Carbon dioxide; Carbon dioxide assimilation; Global warming; Plants; Plankton

Introduction

The earth is warmed up by the heat evolved by the burning of fossil fuels. Carbon dioxide assimilation is a reverse reaction. By absorption of carbon dioxide and heat by carbon dioxide assimilation, earth can be cooled down.

Best method to protect global warming is the promotion of growth of plant and plankton. To promote the growth of plant, the supply of nutrient nitrogen and phosphorous is most important. Nutrient nitrogen such as nitrogen oxide is produced much amount in the burning process. But by the reason that nitrogen oxide gives bud effect for health and elimination process is carried out. I will tell one example how Setoinland Sea was destroyed by this mistake.

I am studying about the anti-aging food [1-6]. Average life in Japan: Male is 80.50 (third), female is 86.86 (top in the world). I wonder why Japanese live longer than other country. I believe that Japanese food based on fish is fit and good for long life. Secret of anti-aging is to eat whole body of small fish. Small fish was cheap in 1930. But the fish is more expensive than meat now by the following reasons.

I was born at Tanokuchi, Kojima, Okayama in 1930. The town is located near sea. The protein source was almost fish. We did not eat meat because meat was much expensive than fish. Shimotsui is glorious as fisherman town. Many fishing boats were fishing at near sea. The town was full with dry octopus. But now, when we look down the Setoinland Sea from Marine liner train running over bridge connecting Marugame and Kojima, we cannot find a fishing boat. Fishing business was destroyed. Carbon dioxide assimilation of plant stopped. The reason is law to shut out the supply of N (nitrogen) and P (phosphorous) which are food of plankton, and plant.

I will explain the way to increase carbon dioxide assimilation and also the way to decrease carbon dioxide and lower the temperature of earth.

Useful Nitrogen Oxide NOx

Sea weed Nori (rolling material to make Onigiri, Sushi, Norimaki) contain 30% protein. Protein is polymer of amino acids. Amino acids contain one nitrogen. For the production of such compounds, corresponding nitrogen is necessary and for the growth of Nori, much nitrogen is necessary. Newspaper Ehime Shinbun at Matsuyama reported that drainage purification process block the production of Nori. Saijo district was a production district of Nori since Edo 300 years, but Nori produced at this district was brown and not black and had no commercial value. At Houjo district 10 km north of Matsuyama, 90 persons were producing Nori in 1978, but no one producing Nori in 1983. Fourty years ago, at west side sea shore of Matsuyama, large amount of sea weed were washed ashore, when strong wind blow, and many cucumber (Namako) were there in sea weed.

At west side, there is water purification center. Ammonium salt, nitric acid salt and urea were changed to nitrogen and clean water like drinking water is released to sea. At near this purification center, we cannot find weed and fish.

At Setoinland Sea, surrounded by Honshu, Shikoku and Kyuushu, plankton decreased. Sand lance (ikanago), sardine (iwashi) grow by eating plankton decreased.

Abalone (awabi), echinus (uni), cucumber (namako), stone fish (okoje), file fish (kawahagi) grow by eating sea weed decreased. Cutlass fish (tachiuo), sea bream (tai), black sea bream (chinu), octopus which eat these fish decreased. Oyster decreased. There is no sea weed. Bottom of Setoinland Sea is sea desert.

At purification center, nitric acid ion is reacted with ammonium ion giving nitrogen gas

$$4\ NO_3^- + 6\ NH_4^+ \text{-----} \rightarrow 5\ N_2 + 12\ H_2O \text{-------(1)}$$

In 1 liter rain water, 0.8 mg ammonium ion and 0.44 mg nitric acid nitrogen, total 1.2 mg of nitrogen are contained. As 1200 mm water falls in one year, 120 L of rain fall in in 1 m^2. 15 kg nitrogen in 1 hectare area is given as fertilizer to all area irrespective mountain, field or sea.

How such effective nitrogen compound are produced. Air consists of 80% nitrogen N_2. This nitrogen must be converted to NO_3^- or NH_4^+. Nature has natural systems to change N_2 to NOx for thousand years. By thunder storm and by burning, following reaction proceed.

$$1/2\ N_2 + 1/2\ O_2 \text{-------> } NO - 21.6\ kcal$$

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$2NO + O_2$ ----------> $2 NO_2$ + 13.5 kcal

$3 NO_2 + H_20$ ----------> $2 HNO_3 + NO$

By the high temperature at fire place for cooking, warming up of room, NOx is produced and dissolved in rain water, giving nutrient nitric acid ion NO_3^- produced. NO_3^- ion is absorbed in plant. In such way, recycle is done for 10 thousand years. As civilization advances, people use fossil fuel like oil, natural gas and coal. Large amount of NOx are liberated. The facility like power station have denitration process. Gas is passed through catalyst and NO is converted to N_2 gas

$4NO + 4NH_3 + O_2$ --------> $4N_2 + 6H_2O$ --------(2)

2×10^6 t 1.13×10^6 t

Equimolar amount of ammonia is required to eliminate NO. As shown in equation (1) and (2), equimolar amount of ammonia is used for the elimination of one nitrogen oxide.

The production of nitrogen oxide by persons operation in Japan is two million tones. If destroy NOx by ammonia, 1.13 million tone ammonia is necessary. This amount is 2 times of nitrogen fertilizer used in Japan. To make ammonia 1.13 million tone, 0.2 million tone hydrogen gas is required. To make 0.2 million tone hydrogen, butane 0.64 million tones is required. As the result, 1.76 million t carbon dioxide is released.

$C_4H_{10} + 8 H_2O$ ---->$9H_2 + 4 CO_2$

0.64×10^0 t 0.20×10^6 t 1.76×10^6 t

$N_2 + 3 H_2$ ----> $2 NH_3$

0.20×10^6t 1.13×10^6 t

Artificial elimination process of nitrogen oxide in power station flue gas is destroying useful NOx to useless nitrogen gas, using ammonia obtained from precious fossil fuels producing carbon dioxide for earth warming. Such uneconomical NOx elimination process should be stopped.

NOx in automobile exhaust gas is useful N source. Catalyst to eliminate NOx is accommodated now. But this catalyst is not necessary. There is strict rule to restrict NOx concentration limitation. But this rule should be excluded.

Diesel engine car can run with good fuel efficiency generating much NOx. Diesel car are encouraged.

Useful Phosphorous Compounds

Phosphorous P is important atom constituent of plants and animals. Phytic acid (inositol hexaphosphate) calcium salt is contained in every surface of grain such as rice, wheat and corn about 30%. Plant makes glucose by photosynthesis from carbon dioxide and water. Some of glucose is converted to inositol. Inositol is converted to phosphoinositides (PIP_2) and phytic acid. PIP_2 is converted to IP_3 and diacylglycerol. These two compounds are essential for signal transduction of plant [8-10]. Plant makes phytic acid as storage of phosphorous. Phosphorous is an essential atoms as fertilizer, because it is an essential atom to make DNA. The seed store phosphorous atom as a store so that even when seed germinates at no phosphorous land. To make this phytic acid, plants absorb corresponding phosphorous at harvest time. Lack of phosphorous give poor harvest.

How phosphorous is supplied. There are four routes to supply phosphorous to plant.

(1) Tripolyphosphate: As laundry detergent, 60 thousand tones were used in 1984. Fish 490 thousand tone was produced.

Two news about the red sea (red plankton grow) at near hatchery fish plants at Kagawa prefecture, and much water weed grow at Biwako lake were reported. These were special event at special district but Japan Government established Environment Ministry. This Ministry established rules to inhibit the growth of all plankton effective for all over Japan. Setoinland Sea changed dramatically. Sea weed do not grow. Plankton does not grow. Nori growing plant stopped. Fish decreased. Fisher man decreased. Carbon dioxide assimilation decreased. Fixing of carbon dioxide and absorption of heat decreased. Use of tripolyphosphate is recommended.

(2) Human excreta: Animal eats food containing P and exclude excreta containing P. When toilet disposal is sent to excreta disposal treatment plant. P in water was made to water insoluble mass, mixed with cement and made to concrete and buried in soil. Plant cannot use P any more. This process should be avoided. Because excreta is best food for plant. Ocean dumping, field dumping and forest dumping of excreta are recommended.

(3) P in the sea water and river: 88 μg of P is in 1 little sea water. The Kuroshio Current Japan (running water from south to north at east south coast of Japan) is clean and contains poor nutrition salt (phosphate salt, nitrate salt) and poor in plankton and fish. Oyashio Japan (running north of Japan near Hokkaido) is rich in nutrient salt and rich in plankton and fish. Cold current running west coast of United State is very rich in nutrient salt and is rich in plankton and fish.

Why such difference happen. Concentration of N (nitrogen) and P (phosphorous) of surface sea water at 100 km south of Muroto (South corner of Shikoku) is 1 μg/l, 0.3 μg/l, respectively. These values are 1/20000, 1/2000000 of ideal concentration for cell growth experiment. N 33 μg /l, P 2.9 μg /l. At 1000 m deep sea, water is 30 times and 10 times rich in nutrition than that of surface sea water. Surface is warm (26°C) and bottom is cold (5°C). Then counter current does not happen. At North Sea, where Oyashio running, surface is cool and bottom is warm. Then counter current rose bottom nutrition to surface. Professor of Kohchi University reported that growth of plankton is good in water taken from deep sea. Some agitation or stirring of sea water by constructed fence may possible using current power or wind power.

At Setoinland Sea, poor nutrient Kuroshio running and thunderstorm is rare, once in two years, shut down of N and P resulted in no growth of plant, no assimilation and no signal transduction of plant.

Carbon Dioxide Assimilation

Carbon dioxide is promoting the warm up of earth. This is a biggest problem for earth. Carbon dioxide assimilation produces carbohydrate (glucose) and oxygen absorbing heat 114 kcal.

Assimilation

$CO_2 + H_2O + 114$ kcal ----> $1/6\ C_6H_{12}O_6 + O_2$ ----(3)

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Burning

(A) 44 g 18 g 114 kcal 30 g 32 g 22.4 L

(B) 1.47 t 38×10^5 kcal 1 t

(C) 1.47 t 38×10^5 kcal 1 t

(D) 69×10^6 t 1.8×10^{12} kcal 47×10^6 t

(E) 4.4×10^{10} t 2.5×10^{15} kcal 1.4×10^{10} t

(A) At laboratory: The reaction of CO_2 1 mole 44 g and H_2O 1 mole 18 g absorbing 114 kcal giving glucose 1/6 mole 30 g and oxygen O_2 1 mole 32 g, 22.4 L, is called as carbon dioxide assimilation. This reaction is most important reaction for our all living biology. By this reaction, all biology could live for 100 billion years.

(B) At rice field: Rice grows by eating carbon dioxide. How much amount of carbon dioxide is eaten at 1 hectare, 1000 m^2, 330 Tsubo. Rice 500 kg is produced at 1 hectare. Plant 1 tone, 1000 kg is produced including rice straw in one year. To make 1 tone of plant, carbon dioxide 1 tone × 44/30=1.47 tone are absorbed in one year. Heat 38×10^6 kcal is absorbed.

(C) At wheat field: We can get wheat in spring at the same field as rice field. Carbon dioxide 1.47 tones and, 25×10^5 kcal can be absorbed. In such amount, earth is cooled down and warming up is protected. At the under of big tree, we fool cool. This is due to the absorption of heat by assimilation.

(D) At Setoinland sea: Area of Setoinland sea (sea between Shikoku and Chugoku) is 47000 km^2. 4.7 million times wider than 1 hectare. If we can do the assimilation with the efficiency as rice field, by getting sufficient N and P supply. $1.47t \times 47 \times 10^5 = 69 \times 10^6$ t of carbon dioxide is absorbable and $114 \times 47 \times 10^6 = 5.3 \times 10^{12}$ kcal heat is absorbable. And 47×10^6 t of food will be produced.

(E) At earth: 80% of Carbon dioxide assimilation are said to be carried out at sea. Assimilation is carried out by sea weed and plankton. Sea weed and plankton are growing under ice at arctic and Antarctic ocean, eating much carbon dioxide, absorbing much heat and giving much food for whales, penguin and earless seals. When we consider the fact that oil is fossil of plankton and coal is a fossil of tree. We astonish the magnitude, greatness and contribution of plankton assimilation.

The reason why earth is warmed up is due to the heart evolved by the burning of fossil fuels. Assimilation is a reverse reaction. By absorption of heat by assimilation, earth can be cooled down.

Fossil fuel 1.4×10^{10} t was burned at whole world in 2010 and about 4.4×10^{10} t CO_2 was produced and 2.5×10^{15} kcal is produced. By doing reverse reaction, assimilation, and by absorption of same amount of CO_2 and heat, the equilibrium of CO_2 and heat will be possible.

(F) Prof. Matsunaga, Tokyo agriculture University studied the fixing of carbon dioxide (Chemistry and Chemical Industry Japan 46, 763 (1993). Sea weed can grow 4320 g/m^2/day, if enough N and P are provided.

Estimated amount of buried fossil oil is 100 years, natural gas is 200 years, and coal is 200 years. We must save the consumption of fossil fuel considering how we can drive a car and airplane after 200 years. How electricity is generated. Fossil is limited precious treasure. We should not use fossil for elimination of NOx.

Summary

Plants are growing by eating CO_2, nutrient N and P. Supply of N and P is a key point. We must consider the methods to increase nutrient nitrogen and phosphorous.

Proposed methods to protect global warming

1. NOx concentration limitation rule of automobile exhaust gas should be excluded.
2. Catalyst to eliminate NOx should not be accommodated in a car.
3. Diesel engine car (produce more NOx, high fuel efficiency) is recommended.
4. Elimination process of nitrogen oxide in power station flue gas should be stopped.
5. Elimination processes of nutrient nitrogen and phosphorous and organic compound in drainage should be stopped.
6. Excreta is best food for plant. Ocean dumping, field dumping and forest dumping of excreta are recommended.
7. Bonfire should be allowed.
8. Rule to use high temperature incinerator (generate no NOx, consume extra fossil) should be discarded.
9. Use of tripolyphosphate as detergent additive are recommended.
10. Promotion of food production by giving N, P fertilizer is recommended.
11. Double cropping is recommended (3 tone CO_2 is consumed at 1 hectare).

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