

SUMMARY OF REPORT

Shizen-Saibai (No-input cultivation) is a cultivation method without any pesticide, any herbicides, and any chemical nor organic fertilizer.

Needless to say, the conventional farming has various baneful influence on our human health and the entire agricultural and living environment, but even in organic farming which uses animal manures or/and imported vegetable origin fertilizers as organic fertilizers have the same risk issues and it's considered not real sustainable agriculture.

About fertilizer issues

Animal fertilizer: Manure made of excreta of animals, used for most Organic farming. Cattle eat mainly concentrated feed of imported corn which is high in calories, and most of the imported corns are contaminated in post-harvest or genetically modified. Moreover, during the breeding stage of cattle, cattle are taken many antibiotics or hormone drugs etc. It's doubtful that the soil used such animal fertilizer can keep clean and safe soil.

Excess of Nitrogen: If there is too much fertilizer and plant absorb large amounts of nitrogen, photonic synthesis could not keep up with nitrogen digestion. Undigested nitrogen changes to sodium nitrite, and sodium nitrite reacts chemically with secondary amine, and may produce nitrosamine which is harmful carcinogen.

Moreover, too much fertilizer causes a big problem of underground water contamination by nitrogen (nitrate nitrogen). It's known that vegetables and water which contain a significant amount of nitric acid causes blue baby syndrome or diabetes.

Dependence of imported fertilizer: Most vegetable origin (oil cake) fertilizers used in Japan are imported. Depending on imported fertilizer can't be considered sustainable agriculture, because it uses energy for transport and release enormous carbon dioxide. The same can be said to the imported feed for animal fertilizer. Therefore, we think the agriculture which requires the greatest amount of organic fertilizer is not a sustainable agriculture.

Reducing fertilizer decreases disease and pest: As fact, farmers noticed reducing of fertilizer decrease the disease and pest of crops, because the crops without fertilizer has stronger vitality by being close to the wild condition.

About Shizen Saibai

Requirement for Shizen Saibai: Farmers should focus on bring out power and vitality of the soil and crops fully. For that, farmers need further knowledge and techniques than the conventional farming such as suitable crops for the land, the proper timing for the work, seedbed soil, plowing method, raising seedling and settled planting techniques, weeding, ensuring of the soil temperature, humidity and dryness, cultivar selection which suitable to the land, self-seed production, pruning technique, creating suitable environments for each crop. Shizen Saibai can't be achieved without respecting for nature, making nature as norm and adapting the nature. Farmers need to judge and find out the nature of the land, crops and climate.

Choose suitable seeds to the land: Farmers should choose true breeding seeds which suite to the area and the farmer, and the seeds will be optimally adapted seeds to the area's climate and soil by repeating the self-seed production for years and decades. "Self-seed production" is very important point for Shizen Saibai.

Nitrogen (available nitrogen) solution in Shizen Saibai: High content of the compound of fusibility nitrogen and phosphate increase the morbidity of disease and pest. However, the growth of crops needs a supply of nitrogen. There is a rhizobium bacterium in the soil as a nitrogen fixer, which exists around the leguminous plants' rhizosphere. This nitrogen fixing capability is higher than today's chemical nitrogen fertilizer. Another nitrogen fixer is azotobacter, which exists independently all over the soil. As long as not using soil fumigant, this bacteria's soil fixer capability is quite high. Also 5% of nitrogen is contained in the humus soil, which is very enough nitrogen stock in the soil. By doing proper intertilling works for the crops, the aerobic bacteria become more active, and it will grow the roots to increase the nitrogen supply.

Disease and pest issue in Shizen Saibai: As for disease and pest damage in Shizen Saibai, most important thing is to observe the underlying cause from various perspectives and give thorough thought to the climate, soil, seed, cultivation management etc. By continuing Shizen Saibai method and self-seed production at suitable land at suitable season to follow the nature, disease and pest damages will be decreased.

Learn from forest trees and wild animals: Forest trees grow well without any artificial fertilizer. Though the road trees don't even have the fallen leaves around the trees to be

its natural organic fertilizer because the fallen leaves are usually cleaned up by human, the trees grow well. You will find important points through observation of forest, which modern agriculture ignores. Plants grow by taking in the natural nutritious gifts which are given unlimitedly from the earth, rain, air and the sun, as its needed basis. This should be the natural state of plants. However, it seems we disrespect these primordial natural vitalities. Plants are much stronger and advanced living nature than we think.

Weeds: Weed-control measure and weeding are the most heavy and important work for any cultivation which don't use any chemical herbicide. Understanding of the meaning of weed existence and taking appropriate measure to it are important for increasing the yield and improving the quality. The role of weeds in the agricultural biogeocoenosis is to "make the soil soft and warm and give proper moisture." The management of weeds will be differed by the crop selection and the soil environment. Weed is great existing element in a way, but proper weed management is important to achieve satisfying crop yield for us to live. We can choose to do weeding or utilize the weed power by not weeding as needed basis. We should understand the weed's nature and get along with them.

Water retention and drainage: Regarding Shizen Saibai's soil matter, drainage is the first matter to consider. Good drainage means, well-established aggregate structure and less hardpan in the soil. Important 3 points are the temperature, moisture and dryness of the soil. Depending on the crops and its properties, the soil drainage management will be varied.

Rhizosphere: Microorganism gathers around the roots. Many microorganisms exist within 1mm from the root (rhizosphere), which is 500 times more microorganisms than other area (non-rhizosphere soil). In Shizen Saibai, the amount of microorganism, the amount of organic acid from roots and the amount of organic matter including root cap are very different from the conventional farming case, hence, we must think differently from the conventional way.

Mineral deficiency in the soil: It's known from the soil analysis that there are enough nutrition in soil which can be used over the next 100 to 10,000 years or more to crop. Even the soil analysis shows such data, the nutrition is not in the available condition yet, so the common soil analysis may show its soil deficiency as the result. However, it's also found that the soil analysis data haven't changed much for decades without using any fertilizers, and the soil always have enough nutrition for crop harvesting. From this

study, it can be said that the soil can change only necessary amount of nutrition to be able to available and absorb. Plants secrete various organic acids from their roots, and also supply to each other with microorganisms, create the soil environment and live together. The amount and quality of roots related to the vegetation result, good and bad. Too much fertilizer causes significant amount of roots losses, and the plant will lose the strength.

Micronutrients and Mineral deficiency: In Shizen Saibai, we don't even use micronutrients for fertilization purpose. Without giving micronutrients, crops won't show the condition of micronutrient deficiency. Even though chemical analysis of nutritional value of crops can't show the clear difference, antioxidant potential analysis data shows the big difference between Shizen Saibai and conventional farming. It's already started as the world movement to display this antioxidant potential for products.

Farmers of Shizen Saibai: The number of Shizen Saibai farmer is increasing. Continuance is important. After 5 years of Shizen Saibai, you may be able to see the good future. As for self-seed production, farmers likely to struggle with the unstable quality at first. One must choose proper true-breeding seeds. Moreover, it seems to take a long time to be able to use the field as Shizen Saibai where was fertilized with immature compost (especially animal fertilizer and bark compost) for all layers.

Shizen Saibai farm products: The taste of Shizen Saibai products are not so strong or thick, but rather slightly sweet, and it's characterized as refreshing and pleasant after taste. It feels like to assimilate into body easily.

We did "decay experiment" with a conventional farmed cucumber from a supermarket, and a cucumber from Shizen Saibai farm. Put them in the same conditioned glass bottles separately and monitored. The conventional farmed cucumber decays and loses shape in a few weeks, and emit bad rotten smell. On the other hand, the Shizen Saibai cucumber keeps its shape better and didn't decay. It's fermented and smells sweet like Japanese pickles. (This data result doesn't mean to work for everything.)

Shizen Saibai is characterized by very slow initial growth, especially the aboveground part is slow. The growth process of underground part is not slow, crops take more time to expand root in the soil. The leaf color of Shizen Saibai plants is relatively lighter color looking, because the cuticle layer of the leaf surface is thicker than the conventional farm leaf. Once you boil the leaf for cooking, the color will get brighter.

Future of Shizen Saibai: Agriculture methods in which the multiuse of fertilizer will come to the end through the heavy load on the environment and human. It seems permeating of Shizen Saibai will be a spearhead to solve modern agriculture problems, and it's a sustainable agriculture.



SHIZEN-SAIBAI Farmer
Mr. and Mrs. Akiba



SHIZEN-SAIBAI Master
Mr. Kimura



SHIZEN-SAIBAI Farmer
Mr. Sekino



SHIZEN-SAIBAI Farmer
Mr. Orikasa



SHIZEN-SAIBAI Rice Farmer
Mr. Narisawa



SHIZEN-SAIBAI Farmer
Tanasou-Sarada Farm



SHIZEN-SAIBAI Farmer
Mr. and Mrs. Shibuya



SHIZEN-SAIBAI Farmer
Mihono-Sato



SHIZEN-SAIBAI Farmer
Mr. Akashi



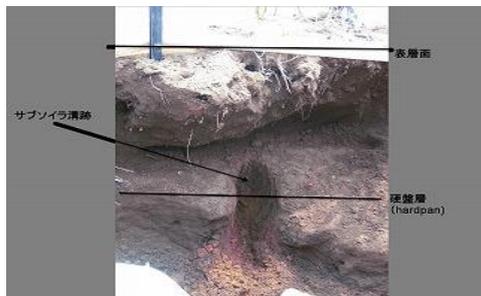
6/26 in Miyagi



L : SHIZEN-SAIBAI R : ORGANIC



“Hardpan” is cold soil.
Sometimes farmers break them with a subsoiler



Nitrogen uptake by millet and sorghum



Self seed production (cucumber)

Commercial seed (cucumber)

Figure of ROOTS

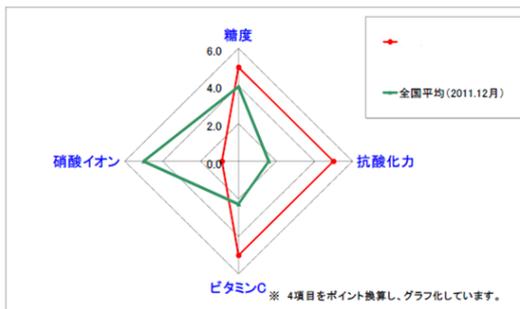


Effect of Hardpan

(corn)

【分析結果】

サンプル名	糖度 (%)	抗酸化力 (TE mg/100g)	ビタミンC (mg/100g)	硝酸イオン (mg/L)	味 (1~5)	コメント
	5.3	72.8	24.9	239.8	3	水分が少なく、繊維質な食感。辛味は少なめ、酸がたまっており、癖がある。
全国平均(2011.12月)	4.2	23.2	11.4	1367.7	3	N=13
五軒値	-	-	11.0	2000	-	-



Japanese mustard spinach

Antioxidant power

[The responsibility for this article]

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