जैविक खेती सूचना पत्र
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जैविक खेती सूचना पत्र, राष्ट्रीय जैविक खेती परियोजना के अन्तर्गत जारी एक बहुभाषीय तिमाही प्रकाशन है। जैविक खेती के उत्थान, प्रचार प्रसार व इसके नियामक तंत्र से जुड़े लेख, नयी सूचनाएं, नये उत्पाद, विशेषज्ञों के विचार, सफल प्रयास, नयी विकसित प्रक्रियाऐ, सेमिनार–कान्फ्रेन्स इत्यादि की सूचना तथा राष्ट्रीय व अर्न्तराष्ट्रीय समाचार विशेष रूप से आमंत्रित हैं। सूचना पत्र में प्रकाशित विचार व अनुभव लेखकों के अपने हैं जिसके लिए प्रकाशक उत्तरदायी नहीं है।

Organic Farming Newsletter (OFNL) is a multilingual quarterly publication under National Project of Organic Farming. Articles having direct relevance to organic farming technology and its regulatory mechanism, development of package of practices, success stories, news related to conferences, seminars etc, and national and international events are especially welcome. Opinions expressed in articles published in OFNL are those of the author(s) and should not be attributed to the publisher.

प्रिय पाठको

प्रेरणास्प्रद लोगों की सोच तथा उनके संजीदा प्रयासों के फलस्वरूप उत्पादकता तथा दीर्घकालीन स्थायित्व के बीच समन्वय स्थापित कर आज की जैविक खेती परिकल्पना को वास्तविक रूप दिया गया है। शुरूआती हिचकिचाहट के बाद जैविक खेती अब विकास की मुख्यधारा से जुड़ रही है व भविष्य में आर्थिक, सामाजिक व पर्यावरणीय सुदृढ़ता की ओर अग्रसर है। भारत में लगातार बढ़ती जन जागृति तथा अधिकाधिक किसानो द्वारा इसे अपनाये जाने से पिछले 04 वर्षों में जैविक खेती क्षेत्र का 20 गुना विस्तार हुआ है। भारत एक प्रमुख जैविक खाद्य उत्पादक देश के रूप में उभरा है। 8.65 लाख है. से अधिक क्षेत्र प्रमाणींकृत जैविक के अधीन लाया जा चुका है। मध्य प्रदेश, गुजरात, महाराष्ट्र, उड़ीसा तथा उत्तर पूर्वी राज्य उत्तरोत्तर बढ़ते क्षेत्र के साथ अग्रणीं राज्य हैं। राष्ट्रीय जैविक खेती परियोजना के अधीन कार्यरत सेवा प्रदाता संस्थाओं ने 1.5 लाख है. क्षेत्र जैविक प्रमाणीकरण के अंतर्गत जोड़ा है।

विभिन्न माध्यमों द्वारा सूचना प्रवाह ने इस विकास में प्रमुख भूमिका निभाई है। जैविक खेती सूचना पत्र में श्रंखला रूप में प्रकाशित विभिन्न फसलों की उत्पाद प्रक्रिया को एक सराहनीय कदम के रूप में पाठकों से मान्यता मिली है अन्य सूचना स्तंभ भी उपयोगी पाये गये हैं। प्रस्तुत अंक इसी श्रंखला की अगली कड़ी, जैविक खेती क्षेत्र की सांख्यिकी तथा अन्य स्थायी स्तंभों के साथ प्रस्तुत है। पाठकों की प्रतिक्रयाएं एवं सुझाव आमंत्रित हैं।

Dear Readers

With the conscious efforts of inspired people to create the best possible relationship between productivity and sustainability, organic agriuculture emerged as an alternative and viable preposition. With initial hiccups, organic agriculture is now being embraced by the mainstream world over and shows great promise commercially, socially and environmentally. The awareness is also growing in India and more and more farmers are embracing it, resulting into almost 20 fold growth in last 4 years. India is fast emerging as an “Organic Hub” for different agricultural, horticultural and spices and condiments products. More than 8.65 lakh ha of land has already been brought under organic certification management. Madhya Pradesh, Gujarat, Maharashtra, Orissa and North Eastern States are amongst the leading states where organic area is spreading day-by-day. Through service provider scheme under National Project on Organic Farming more than 150,000 ha land has been brought under organic certification process.

Information dissemination through different channels has significantly contributed to this growth. A series on package of practises on different crops being published in Organic Farming Newsletter has been widely appreciated. News and events columns have also attracted the attention of people. In continuation of our sincere efforts and dedication the current issue is presented with latest statistics of organic India with all the permanent features. Comments and opinion are invited from the readers.

डा. ए. के. यादव / Dr A.K. Yadav

संपादक / Editor

Organic Package of Practices for Rice from West Bengal

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Under Technical Cooperation Project on Development of Technical Capacity Base for the Promotion of Organic Agriculture in India of the National Centre of Organic Farming (NCOF), Ministry of Agriculture, Government of India and Food and Agricultural Organization (FAO) of the United Nations.

Background

Under a Technical Cooperation Project (TCP) of DAC-NCOF and FAO on Development of Technical Capacity Base for the Promotion of Organic Agriculture in India an attempt was made to compile most authentic organic packages for 20 important crops. These packages are being published in a series in Organic Farming Newsletter since June 2007. So far organic packages defined for some important crops of Maharashtra, West Bengal and Tamil Nadu have already been published. Organic packages for Rice specific for West Bengal is presented here.

राष्ट्रीय जैविक खेती केन्द्र तथा विश्व खाद्य संगठन के सहयोग से कुछ प्रमुख फसलों की जैविक उत्पादन प्रणाली तैयार की गई है। ये जैविक प्रणालियॉ जैविक खेती सूचना पत्र के पिछले 5 अंकों से क्रमबद्व रूप से प्रकाशित की जा रही हैं। इस अंक में पश्चिम बंगाल राज्य से धान की फसल हेतु जैविक उत्पादन प्रणाली प्रस्तुत की जा रही है।

Growing season in West Bengal

In West Bengal there are three rice-growing seasons, i.e., aus, aman and boro. Aus rice is usually grown in rain-fed uplands and drylands. It is usually sown by broadcasting dry seed. In south Bengal, aus rice is usually sown between early to mid-May and depending on the maturing period of the variety, the harvest takes place between mid-October to mid-November or earlier. In North Bengal, the aus season extends from mid-March to around mid-August. The main rice-growing season in south Bengal is called aman. Aman paddy seedlings are grown around early to mid-June and transplanted after four to five weeks. There are short, medium and long duration varieties and harvesting takes place from around mid- November to mid-December. Most of the farmers in West Bengal cultivate rice during this season and they use both high-yielding and traditional varieties. The third rice-growing season is called boro, seedlings of which are grown in the month of December with transplanting taking place during January. This season extends usually up to early or mid-May. During the boro season, only high-yielding and hybrid rice varieties are grown, usually in places having assured irrigation, either from canals or deep tubewell. Boro rice was earlier popular because of higher grain yield per hectare; but in recent times, both the cost of irrigation and chemical nutrients have rapidly increased and ground water levels have been regularly falling, and these factors are acting as disincentive for farmers to grow such rice. Since the majority of the farmers grow aman rice, it has been dealt with in greater detail in this package. Aman rice is grown usually in clay silt soils that remain inundated most of the time during the rainy season. Four to six week old seedlings are usually transplanted 15-20 cm apart in fields that have been ploughed, levelled and puddled.

Rice can grow in a wide range of soils and is not attacked by many pests, unless a lot of chemical fertiliser is applied or poor quality seed is used. Weeds are a major problem only if proper land levelling is not done and the water level in the field cannot be controlled. The first weeding is usually done

three weeks after transplantation. One or more weedings are done during the plant's vegetative stage. Usually, one more weeding is done a week or two before harvesting.

पश्चिम बंगाल में धान की फसल मुख्य रूप से तीन ऋतुओं अस, अमन एवं बोरो के दौरान ली जाती है। अस धान वर्षा आधारित शुष्क क्षेत्रों में उगाई जाती है। पश्चिमीं बंगाल में अस धान की बीजाई मध्य मई माह में जबकि उत्तरी बंगाल में मध्य मार्च से मध्य अगस्त में की जाती है। बंगाल का प्रमुख धान उत्पादन समय अमन के नाम से जाना जाता है। अमन धान की पौध मध्य जून में तैयार होने के पश्चात् 4–5 सप्ताह में बीजाई की जाती है। बंगाल के ज्यादातर किसान इसी समय धान की फसल लेते हैं। धान फसल की तीसरी ऋतु बोरो नाम से जानी जाती है तथा इसकी पौध की तैयारी दिसम्बर माह में होने के पश्चात् जनवरी में इसकी बुवाई की जाती है। इस ऋतु में केवल उच्च उत्पादकता वाली संकर प्रजातियों की फसल ली जाती है।
धान की फसल सामान्यतया एकल फसल के रूप में ली जाती है।

Rice is usually grown as a monocrop. In organic rice fields, some naturally occurring mudfish, crab, shrimp, etc., are usually found. In areas where irrigation facilities are available and the soil has good water retention capacity, the traditional farming practice is to grow cowpea or moong bean before sowing rice; and Bengal gram, mustard, linseed, etc., after the rice is harvested. Usually in the winter season, legumes and oilseeds are sown by broadcasting or dibbling two to three weeks before the rice is harvested. This practice is known as relay cropping (or residual moisture cropping). People with access to assured water and credit facilities are able to buy hybrid seeds and agrochemicals. They tend to grow rice two to three times a year or they grow rice during the summer and rainy season and wheat or potato in the winter. Those who grow rice organically or ecologically utilize azolla or blue-green algae as biofertiliser and as a weed-suppressing agent. A few ducks and mudfish are often added to rice fields to improve fertility and keep weeds and pests under control. In a well-designed integrated farm, there is usually a pond in the centre or in a corner of the field connected with canals along the perimeter of the farm. Sometime poultry, goat or pig houses are built above these ponds. Vegetables as well as fruit trees and shrubs along with nitrogen fixing trees like subabul (*Leucaena leucocephala*), *Glyricidia sepium*, jayanti (*Sesbania sesbans*), etc., are cultivated on the outer bunds or on the raised embankments.

Soil

Though rice can grow on a wide range of soils, a clayey loam soil with a pH of 5–6.7 is ideal for its cultivation. Topsoil should ideally be 18 to 23 cm deep. In West Bengal, lands are usually acidic. To reduce acidity, wood ash, rice hull ash, limestone, etc., are added @ 1.25 tonnes/ha. In silt soil, the rate should be doubled and in clayey soil, trebled. Alkalinity is reduced in soils of drought prone areas by adding gypsum. In areas with sandy soils, adding silt from the bottom of ponds considerably improves soil quality.

मृदा

धान के उत्पादन हेतु उपयुक्त मृदा का पी. एच. मान 5–6.7 के मध्य होता है। पश्चिम बंगाल की मृदा अम्लीय प्रकृति की है। अतः अम्लीयता को कम करने के लिये चूना, लकड़ी की राख धान के भूसे आदि का प्रयोग 1.25 टन/है. की दर से किया जाता है। गाद मिट्टी के लिये इनकी मात्राा दोहरी तथा चिकनी मिट्टी हेतु तिहरी मात्रा का प्रयोग किया जाता है। यदि मिट्टी में क्षारीयता हो तो जिप्सम का प्रयोग किया जाता है।

Varieties

Rice is grown in a wide range of soils and climatic conditions. It is also grown in fields which remain flooded with 15–20 cm deep water (or even 120–150 cm deep water). Due to this wide adaptability, farmers have an extensive selection of different varieties of rice they can choose from. At present only 15–20 varieties are widely cultivated, but 300– 400 varieties used to be cultivated once in West Bengal alone. Rice varieties

are classified according to their ecosystem adaptability, viz., upland rice, flooded paddy, floating rice, etc. Rice varieties are also classified according to their maturation period which may extend from 90 to 180 days. Farmers grow different varieties of rice for different purposes. Some varieties are grown for everyday use, other varieties are aromatic and used for special dishes. Some varieties of rice are grown especially for making snacks like puffed, flattened or popped rice. Traditional varieties are important because they usually have better drought tolerance and are often less susceptible to disease and moisture stress.

प्रजातियॉः–

वर्तमान में पश्चिम बंगाल में धान की 15–20 प्रजातियों की बुवाई की जाती है। इन प्रजातियों की पारिस्थितिकीय अनुकूलन एवं परिपक्वन अवधि के आधार पर वर्गीकृत किया जाता है। परिपक्वन अवधि 90–180 दिन तक की होती है। मूल रूप से पारंपरिक प्रजातियॉ जो कि सूखे एवं कीट से प्रतिरक्षा सक्षम् होती है, का प्रयोग किया जाता है।

Seed Treatment

Before sowing, seeds are floated in water to segregate the empty hulls. Some farmers further segregate the high-density seeds by immersing them in a salt solution. The high-density seed that settles at the bottom is selected for planting. Seeds are usually soaked in warm water (50–60^{0}C) with 6–8% fresh cow urine added for a period of 30–40 minutes. While seeds are being soaked, 50 gm of antagonistic bacteria *Pseudomonas fluorescens* should be added to the water (especially if warm water and cow urine treatment is not possible). This will protect the plants from fungal and bacterial diseases.

The seeds are then spread on banana leaves and covered with wet jute bags. Usually after 18–20 hours' incubation, they are broadcast on the seedbeds. During incubation, 2–2.5 kg of phosphobacteria may be mixed with the paddy seeds; this will improve the availability of phosphorus to the plants. Incubation should be done in a dark place and should not exceed 24 hours, particularly in hot, humid regions.

बीज उपचारः–

उच्च गुणवत्ता के बीजों के चयन हेतु बीजों को पानी में डुबोया जाता है। इसके अतिरिक्त नमक के पानी का भी प्रयोग किया जाता है। पानी के अंदर नीचे बैठने वाली बीजों का चयन बीजाई हेतु किया जाता है। बीज उपचार हेतु बीजों को 50–60 से.ग्रे. तापमान वाले पानी तथा 6–8% गाय के मूत्र के मिश्रण में 30–40 मिनट तक भिगोया जाता है। इसके साथ ही कवक एवं जीवाणुजनित बीमारियों के बचाव हेतु सूडोमोनास फ्लोरेसेंस का प्रयोग भी किया जाता है। तत्पश्चात् इन बीजों को केले के पत्तों पर फैलाकर इन्हें गीले जूट के थैलों से ढ़क दिया जाता है। इस स्थिति में 18–20 घंटे रखने के पश्चात् बीजों की क्यारियों में बीजाई कर दी जाती है। अच्छे परिणामों हेतु बीजों को फास्फो बैक्टीरिया से भी उपचारित किया जाता है।

Preparation of the main field

As mentioned earlier, at the time of sowing, rice is broadcast in upland (non-flooded) fields, including those subject to slash and burn agriculture. Transplanting of seedlings is usually done in case of lowland paddy. Seedlings are raised in dry or wet seedbeds. Usually an 800–1,000 sq.m. seedling bed is required to raise sufficient seedlings for planting a one-hectare paddy field. The field must be ploughed 5–6 times and levelled repeatedly, breaking all large soil clods. About 6–8 quintals of compost or 10–12 quintals of farmyard manure are applied to the seedbed. Some farmers also apply up to 10 kg of neem or mahua oil cakes. The dry seed is broadcast and then covered with a thin layer of soil. This technique is known as dry seedbed, and is usually practiced in areas where the soil has good texture and high organic matter content. In other areas, wet seedbeds are prepared. Basic practices in wet seed beds are more or less similar to those of dry seed beds, with the difference being that after making the bed the whole field is flooded and saturated with water, allowing one cm water layer to remain covering the soil. As the seedlings start growing, the water level is allowed to increase. Both in dry and wet seedling beds, 15–20 cm deep drains are made at 135–150 cm intervals.

Seed rate and spacing

For short duration (<120 days) varieties, about 60 kg of paddy seed are required for preparing seedlings for one hectare. Usually the seed rate for medium duration varieties (120–135 days) is 50 kg and for long duration varieties (>135 days), 40 kg per hectare (assuming an 80–85% germination rate). Seedlings are transplanted after three or four weeks in short duration varieties, four to five weeks in medium duration varieties and five to six weeks in the case of long duration varieties. Two seedlings should usually be transplanted per hill at 15–20 cm, 20–25 cm, 25–30 cm for short, medium and long-term varieties respectively.

खेत की तैयारी एवं बीज दर

धान की पौध सामान्यतया शुष्क अथवा गीली क्यारियों में तैयार की जाती है। एक हैक्टेयर भूमि में पौध रोपण हेतु आवश्यक पौध के लिये 800–1000 वर्गमीटर की क्यारी की आवश्यकता होती है। 5–6 बार खेती की जुताई कर इसके 10–12 क्विंटल FYM मिला दें। 10 कि.ग्रा. नीम या महुआ की खली भी मिला दे। इसके पश्चात् सूखे बीजों को छिड़क कर इसे मिट्टी की तह से ढ़क दें। यह विधि शुष्क क्षेत्रों में उत्पादन हेतु अपनाई जाती है। जल मग्न अवस्था में रोपाई हेतु खेत में 1 से.मी. ऊँचाई तक पानी रखें।

अगेती प्रजातियों (120 दिन से कम) के संदर्भ में एक हैक्टेयर भूमि में रोपाई हेतु आवश्यक पौध तैयार करने के लिये 60 कि.ग्रा. बीज की आवश्यकता होती है, जबकि मध्य अवधि फसलों के लिये 50 कि.ग्रा. तथा 135 दिनों से अधिक की फसलों हेतु 40 कि.ग्रा. बीज प्रति हैक्टेयर की दर से आवश्यक होती है। मध्य अवधि फसलों में 4–5 सप्ताह की पौध जबकि लंबी अवधि की फसलों में 5–6 सप्ताह की पौध की रोपाई ली जाती है तथा पौध से पौध की दूरी इनमें क्रमशः 15–20 से.मी., 20–25 से.मी. तथा 25–30 से.मी. रखी जाती है।

Seedling treatment and planting

The seedlings are dipped for 15–20 minutes in compost tea or manure tea solution in a shallow tray or trench before transplanting. At the time of transplanting, the water level of the main field should be less than 1 cm. After every 6–8 lines, one line should be kept empty. Where rats are a problem, seedlings should be planted in 2.5 m x 2.5 m blocks and 25–30 cm lanes left in between. In each block the border rows should be closely spaced (10–15% less than normal). In lowland rice cultivation, the main field preparation is very critical for good plant growth.

For seed-sown paddy, the dry field is shallow ploughed (about 15 cm) twice or thrice. During these ploughings, farmyard manure is also applied. At this stage, the field is levelled and the bunds are prepared. Then the land is flooded up to a depth of 15–20 cm. Six or seven days after the water has been absorbed by the soil, the muddy field is ploughed again to create a sealed layer between topsoil and sub-soil. For one hectare of land, about 200–250 quintals of farmyard manure or about 80–90 quintals of vermicompost is required. If this is not available, green manure or azolla biofertiliser is applied (details of which are explained in the next section). All rice varieties have a 30-day reproductive and a 30-day ripening period – only the vegetative stage is shorter or longer in different varieties. For short duration varieties, tillering continues for about 30–35 days after transplantation, and for long duration varieties, for about 50–55 days.

पौध उपचार एवं पौध रोपण

पौध को पौध रोपण से पूर्व 15–20 मिनट तक कम्पोस्ट सुषव या खाद सुषव में रखें। पौध रोपण के समय खेत में जल स्तर 1 से.मी. से ज्यादा न रखें। प्रत्येक 6–8 लाइनों के बाद एक लाइन खाली छोड़ दें। यदि खेतों में चूहों की समस्या हो तो पौध रोपण 2.5 मी. x 2.5 मी. के खंडों में करें तथा प्रत्येक दो खंडों के मध्य 25–30 से.मी. की गली खाली छोंड़ दें। बीज द्वारा धान की फसल हेतु सूखे खेत की 2–3 बार जुताई करें तथा जुताई के समय FYM मिला दें। इसके पश्चात् खेत में मेढ़े बनाकर 15–20 से.मी. तक पानी भर दें। 6–7 दिन पश्चात् कीचड़युक्त भूमि में पुनः जुताई कर दें। 200–250 क्विंटल FYM तथा 80–90 क्विंटल/हैक्टेयर की दर से वर्मी कम्पोस्ट मिला दें। यदि कम्पोस्ट उपलब्ध नहीं हो तो एजोला का प्रयोग करें।

आवश्यकतानुसार खरपतवार निकाल दें।

Then the panicle initiation stage starts. After panicle initiation, it takes about three or four weeks before the plant starts flowering. This growth stage is most sensitive to stress.

Weeds

If levelling is uniform and at least 7–8 cm water level can be maintained at the early stage of vegetative growth, weed emergence will be low. Physical removal of weed is the other way, but it is a tedious job and needs to be done at least four times, at 3–4 week intervals. Walking through the field, raising ducks can also suppress weeds. Hand pulling or mechanical weeding, hoeing, tilling, mowing, burning, flooding, smothering, etc., are the techniques used to remove weeds. Maintaining high plant density and water level also reduces the incidence of weeds. (It should be noted here that many paddy-field weeds, especially the broad leaf type, are also used as green vegetable or fodder, both of which are in short supply during the rains.)

Managing Soil Fertility

Soil should be tested for pH, for percentage of organic matter and for phosphate (if it is a high rainfall area or if the soil is lateritic). To maintain soil fertility, a wide range of techniques are used together. If the rice fields have enough moisture in April, green manure with *Sesbania aculeata* (lowlands) (seed rate is 15–20 kg per acre) or *Crotalaria juncea* is applied. Some farmers add 400–500 kg of rock phosphate and up to 1 kg of PSB/ha at the time of incorporating green manure. Nowadays, few farmers practice green manuring. Such farmers sometimes grow cowpea during the early summer as a food or fodder crop and incorporate the crop residues during the first ploughing in the early rainy season. Farmers who have three or more cows usually make a 3 m long, 1.2–1.5 m wide and 1.5–1.8 m deep pit in which they throw the cow dung, dry leaves, kitchen waste, crop residues, weeds, etc., adding some water from time to time. Such farmyard manure is usually ready for use in six months and is applied usually @ 2.5–3 tonnes/ha. Azolla, which is a kind of aquatic floating fern, is used to fertilise fields of lowland rice. Biogas slurry is also added periodically, along with irrigation water, to rice fields, but this method is rarely practised in WB.

Nutrients

The nitrogen requirement of rice can be supplied by applying about one tonne of high temperature compost or 2.5 tonnes of green manure or 2–3 tonnes/ha of azolla along with some duck or chicken manure (small quantities added regularly). Half this quantity should be applied as manure, compost or azolla at the time of sowing; the rest should be applied in the ratio of 1 : 1 at panicle initiation stage and one or two weeks before flowering. In organic rice, the second and third applications can be in the form of liquid manure, vermiwash or biogas slurry or diluted (5%) cow urine (2–3 weeks old). The phosphate requirement of rice can be met by applying 400– 500 kg of rock phosphate along with 1 kg of PSB biofertiliser at the time of field preparation. For nutrient management of an organic rice field, it is important to return as much of the straw to the field as feasible, either as mulch or compost or ash. If cattle are raised, straw bedding should be used to absorb the urine of the animals and the semi-decomposed straw is incorporated during the field preparation.

मृदा उर्वरता प्रबंधन

यदि खेत में उचित मात्रा में नमीं हो तो अप्रैल माह में 15–20 कि.ग्रा./एकड. की दर से ढेंचा के बीजों की बीजाई कर दें। 400–500 कि.ग्रा. रॉक फास्फेट एवं 1 कि.ग्रा./हेक्टेयर की दर से पी.एस.बी. का भी प्रयोग करें। जिन किसानो के पास गायें हैं वह किसान अपना स्वयं का FYM बनाकर 2.5–3 टन/हैक्टेयर की दर से डालें। इसकी एजोला का भी प्रयोग करें।

धान की फसल में नत्रजन आपूर्ति हेतु 2.5 टन हरी खाद या 2–3 टन/हैक्टेयर की दर से एजोला के साथ मुर्गी एवं बत्तख के बीट का प्रयोग भी फायदेमंद रहता है। इनकी आधी मात्रा रोपाई के समय करें। इसके पश्चात् की अवस्थाओं में तरल खाद एवं वर्मी वाश या बायोगैस स्लरी तथा गो–मूत्र का प्रयोग करें। फास्फोरस की आपूर्ति हेतु 400–500 कि.ग्रा. रॉक फॉस्फेट के साथ 1 कि.ग्रा. पी.एस.बी. का प्रयोग करें।

Water Requirement

The water requirement of rainy season paddy is met mainly by impounding rainwater with 15 to 20 cm high bunds around the paddy field. However, supplementary irrigation is often necessary to facilitate timely transplanting and to make up for shortfall of rain during the critical phases of rice growth. As lowland paddy fields are kept submerged in water for about three to four months, the water quality will affect crop yield to a great extent. Approximately 4,000 to 4,500 litres of water (or more) are needed to produce just one kilo of rice in a hot dry climate. For most of the growth cycle of lowland paddy, the fields need 15–20 cm deep water level to be maintained throughout the growing period – mainly to keep weeds under control. During the rainy season, the problem is often of too much water. Water deeper than 20–25 cm at early growth stage (upto 30– 40 days) can result in reduced yield. During summer, more water is needed to grow rice as the relative humidity is lower and evapo-transpiration losses are much higher. There is hardly any rain in West Bengal during December to April, so summer rice production is dependent on pumping ground water or water supplied via canal from dam reservoirs. Summer rice cultivation is not advisable, especially for water stressed areas.

Management of insect pests

Case worm and leaf folders are major pests affecting rice at its early growth stage. Planthoppers and stem borers may cause damage at later stages. Damage from insects can be prevented by draining fields for a day or two at 7–9 days' intervals; and by allowing natural predators to exist by avoiding use of chemicals and pesticides altogether.

नाशीजीव प्रबंधन

धान की फसल में प्रमुख रूप से धान केस वर्म तथा पत्ती लपेटक कीटों का प्रकोप होता है। यदि धान के खेत से 7–9 दिनों के अंतराल पर पानी निकाल दिया जाये तो कीटों के आक्रमण की संभावना कम की जा सकती है।

Management of Rice bug (gundhi poka) (Leptocorisa oratorius acuta)-

- Control the weeds in and around the rice field.
- Plant rice around the same time as neighbouring farmers.
- At the time of flowering, take 15–20 crabs or snails. These are then smashed, allowed to decay and put on a stick about 1–1.5 m in height. The gundhi bugs are attracted by the stench and are thus caught.

Management of Gall midge (Orseolia oryzae)-

- Plough the land after the harvest.
- The stubble and weeds must be removed and composted.
- Seedlings should be treated.
- Seedlings should be properly spaced (45 seedlings within a sq.m.)
- Pest-resistant varieties should be grown, like Bhadrakali, Pabitra, Ruchi, Dibya, Lalat, Rashi, Karna, Mahavir, Daya, Jyoti, Neela, Kunti, Asha, Surekha, etc.

Management of Brown plant hopper (*Nilaparvata lugens*)-

- Plough the land after harvest. Excess water should be drained.
- After every eight rows, there must be a gap of 0.3 m to allow for movement of air.
- Pest resistant varieties should be grown, such as Vijeta, Chaitanya, Krishnabeni, Prativa, IET 8116, Manassarovar, Jyoti, Chandra, Nagarjuna, Neela, etc.
- Remove the stubble and weeds at field preparing stage and compost them.
- Apply grease around yellow plastic plates (10 cm x 12 cm in dimension). Fix them on top of poles, 30–40 cm in height, and keep at intervals of 4–5 m to attract the insect. The insects stick to the plates and can be easily removed.
- Spray neem oil-soap mixture. Mix 30 ml of neem oil and 2–2.5 gm of soap in one litre of water. About 450 litres of thismixture is required per hectare to control the pest.

Management of Green rice leaf hopper (*Nephotettix negropictus*)

- Plant rice around the same time as neighbouring farmers.

- Remove the stubble and weeds and compost them.
- Around 7–8 light traps must be installed per hectare.
- Pest-resistant varieties should be planted.
- The field should be free from any chemical pesticide contamination so that long-jawed spiders and damselflies can attack the adult pests and nymphs.

Management of Stem borer (Tryparyza incertulas)-

- Plough the land after the harvest.
- Remove the stubble and weeds and compost them.
- Sow pest resistant varieties such as Ratna, Sasyashree, Bikash.
- Treat the seedlings.
- Space seedlings properly (45 seedlings within a sq. m.)
- Locate and destroy the yellowish eggs of the pest.
- Install light traps.
- Before transplanting, trim the top portion of the seedlings.
- Trichograma japanicum is generally spread at least @ 50,000 to 1,00,000 per hectare. This kind of wasp should be released at least five times, commencing 30 days after transplantation.
- Install pheromone traps @ 20 traps/ha. Inside each there must be at least 5 mg of pheromone.

Management of Rice leaf roller (Cnaphalocrocis medinalis)

- Plough the land after the harvest.
- Uproot and compost the stubble and weeds.
- Sow pest resistant varieties.
- Treat the seedling.
- Space the seedlings properly (45 seedlings within a sq.m.)
- Install light traps.
- Before transplanting, trim the top portion of the seedlings.
- Trichograma chillonis is generally spread at least @ 50,000–1,00,000 per hectare. This kind of wasp should be released at least five times, commencing 30 days after transplantation.

Diseases

Management of Sheath blight (Rhizoctonia solani and Rhizoctonia sp.)

- Soak the seeds in cow urine (1 : 5) solution for 30–45 minutes before sowing. The seed may also be soaked in Pseudomonas fluorescens solution (10 gm in 300 ml of water) @ 1 kg seed per 300 ml of solution for four hours.
- Remove the stubble of the old crop and compost it.
- Cut the top 2–3 cm of seedlings if they are older than 21–25 days. Spray with cow urine solution (1 : 6–8) after two weeks from the date of transplanting.

Management of Blast (Pyricularia oryzae)-

- Soak seeds in cow urine (1 : 5) solution for 30–45 minutes before planting in the seedbed. The seed may also be soaked in Pseudomonas fluorescens solution (10 gm in 300 ml of water) @ 1 kg seed per 300 ml of solution for four hours.

गंधी पोका का प्रबंधन:

- खेत में खरपतवार को नियंत्रित रखें।
- धान की रोपाई आस–पास के किसानों के साथ ही करें।
- पुष्पन के समय 15–20 केकड़े या घोंघे ले लें, इन्हें कुचल कर 1–1.5 मीटर ऊँची लकड़ी पर चिपका दें, जिससे गुंधी इन पर आकर्षित होंगी, इन्हें पकड़ लें।

भूरे पौध फूदके का प्रबंधन:

- 10 से.मी. x 12 से.मी. आकार की प्लास्टिक की पीली प्लेट पर ग्रीस लगा लें। इसे 30–40 से.मी. ऊँचे डंडे पर लगा दें। इस प्रकार के डंडे खेत में 4–5 मीटर की दूरी पर लगा दें जिस पर कीट चिपक जायेंगे।
- 30 मि.ली. नीम के तेल तथा 2–2.5 ग्राम साबुन का एक लीटर पानी में मिश्रण तैयार कर छिड़काव करें। एक हैक्टेयर के लिये लगभग 450 लीटर मिश्रण की आवश्यकता होगी।

- Dry seed treatment with TV @ 4 gm per kg of seeds.
- Remove stubble of old crop and compost it.
- Grow blast resistant varieties such as Rasi, Bikash, Krishnahansa, Tulsi, IR 64, Aditya, Swarnadhan, etc.

हरी पत्ती फुदके का प्रबंधन:

- एक हैक्टेयर खेत में 7–8 प्रकाश जाल लगायें।
- कीट रोधक प्रजातियॉ लगायें।
- खेत में रासायनिक कीटनाशकों का प्रयोग न करें जिससे लंबे मुंह वाली मकड़ियां कीटों का भक्षण करेंगी।

तना छेदक का प्रबंधन:

- कीट के अण्डों को नष्ट करें।
- प्रकाश जाल लगायें।
- पौध रोपण से पूर्व पौधे के सिरे की छंटाई करें
- रोपण के 30 दिन बाद 50,000 से 100,000 ट्राइकोग्रामा जेपोनिकम के ततैये प्रति हैक्टेयर की दर से छोंड़े।
- 20 फेरोमोन जाल/हैक्टेयर की दर से लगायें जिसमें 5 मि.ग्रा. फेरोमोन हो।

मियान झुलसा का प्रबंधन:

- बीजों को 1:5 गौ–मूत्र के मिश्रण में 30–40 मिनट तक भिगो कर रखें।
- सूडोमोनास फलोरेसेंस (10 ग्राम 300 मि. ली. पानी) के मिश्रण में भी बीजों को भिगो सकते हैं।
- यदि पौध 21–25 दिन पुरानी हो तो इसके सिरों को 2–3 से.मी. तक काट दें।
- रोपण के दो सप्ताह बाद गौ–मूत्र (1:6–8) का छिड़काव करें।

Management of Bacterial leaf blight (*Xanthomonas campestris*)-

- Grow disease resistant varieties such as Ajay, IR-36, IR- 64, etc.
- Remove the stubble of the old crop and compost it.
- Cut the top 2–3 cm of seedlings, if they are older than 21–25 days.
- Weeding should start 20–22 days after transplantation. After weeding, fresh cow dung solution (1 lt of fresh cow dung in 20 lt of water) should be sprayed.

जीवाणु जनित पत्ती झुलसा का प्रबंधन:

- रोग प्रतिरोधी प्रजातियॉः अजय, IR-36, IR-64 आदि की बीजाई करें।
- 21–25 दिन पुरानी पौध के सिरे 2–3 से.मी. तक काट दें।
- खरपतवार नियंत्रण के पश्चात् 1 लीटर गौ–मूत्र को 20 लीटर पानी में मिलाकर छिड़काव करें।

NEW STRATEGIES FOR RICE

Focusing on overall management of the rice-field environment throughout the year and on total biomass (food, fodder, fibre, etc.) production rather than on grain yield alone are the new strategies adopted by organic farmers. Rice cultivation is done in a wide range of ecosystems. In rice cultivation, competition from weeds is often the main constraint. Growing rice along with maize, cucumber, pumpkin, cowpea, niger, etc., as well as rotating the crop with pigeon pea, cassava and other tubers, cowpea or groundnut, are some of the strategies adopted by farmers. Drought-tolerant Nitrogen Fixing Trees are often planted along contour bunds. In coastal areas, salinity is the major limiting factor and late monsoons often affect crop yield. In the high rainfall coastal zones, growing rice on raised beds and raising shrimp, crab, etc., in the trenches between the beds, as well as growing coconut, *Sesbania grandiflora*, etc., on field bunds are the new patterns of farms. In lowland or wet paddy, availability of adequate nutrients and avoidance of pests are the main concerns. The strategies adopted by organic farmers include the incorporation of green manures; raising azolla and other duckweeds along with the rice; introducing insect eating and/or grass-eating fish as well as local ducks; use of vermicompost; use of bio control agents such as NSKE or neem leaf extract; and planting of nitrogen fixing trees and shrubs such as *Sesbania sesbans*, *Thespesia populnea, Erythrina*

indica, Glyricidia sepium along the bunds with lemon grass, beans, *Ipomea aquatica* or taro planted as under storey crops along the edges of the rice fields.

Madagascar System of Rice Intensification (SRI)

This system of rice cultivation was developed in Madagascar in the mid 1980s and has since been tried in various countries, in both chemical intensive and bio-organic farms and has resulted in 50–100% yield improvement even as seed requirement and the irrigation water used are both reduced by half.

The basic aspects of SRI technique/strategy are: a) transplanting very young plants (7–8 to 11–12 days old); b) transplanting single plants; c) transplanting at accurate intervals and at double the usual space (i.e., 30–50 cm); d) taking special care to prevent root bending at less than 3 cm depth. Emphasis is also placed on good drainage and maintaining low water level and alternately drying and flooding fields where feasible. The nursery is also prepared like a vegetable seedling version, on raised beds, with no water standing above the soil surface. Seedlings are planted shallow and almost laterally to prevent roots turning upward. Fields should be weeded, levelled and puddled, 10–12 days prior to transplanting. Weeding in SRI fields starts 8–10 days after transplantation. Fields should be completely drained 15–18 days before harvesting. Wherever controlling water level is feasible, this method has shown excellent results and improved the status of poor farmers, though initial labour requirement is quite high.

Rice-duck farming

Domestic ducks are used in this system and no weeding is done or external fertiliser supplied. Approximately 7–10 days after transplantation, 10–14 day old ducklings are introduced into the rice field @ 20–30 birds/10 acre, depending on available feed and whether ducks stay in the field day and night or remain there only during the day. The water level should be such that the ducks can either swim or walk. The ducks have to be withdrawn when the rice plant reaches heading stage. The ducks can protect the crop from pests and weeds, improve soil fertility by their excreta as well as by aerating the surface soil. This system has been refined in Japan and was widely tested with minor modifications in many south/south-east Asian countries. Protecting ducks from thieves and predators has remained a limiting factor against widespread adoption, despite the obvious benefits.

Integrated farming models for rice

Integration of various farm enterprises into a farm's operations ensures growth and stability in overall productivity and profitability. It also ensures recycling of residue, optimisation of resources, minimization of risk and generation of employment. Various enterprises in a farming system can be grouped under the following subsystems: Trial plot with seasonal and perennial plant: It includes paddy field where generally crops are grown in Kharif and vegetables along with oilseeds in Rabi and homestead garden where vegetables and medicinal plants are grown throughout the year in West Bengal. The vegetable garden or field are surrounded by fruit trees or trees like neem, subabul, karanj etc. Livestock includes cows, buffaloes, hens, ducks, pigeons (in drier parts of West Bengal), pigs and sheep. Biodigester, FYM, compost, vermicompost pits, biogas plant, compost toilet, etc are some of the facilities to be created. Aquatic systems and plants: consisting of ponds or other water harvesting structures along with fish, frog, shrimp, crab, snails and aquatic plants such as the water lily, lotus, water chestnut, ipomea and azolla, duckweed, etc are also useful. Other farm sector enterprises: bee-keeping, sericulture, mushroom raising, lac cultivation, medicinal plant processing, fibre extraction, etc can also be pratised. These subsystems have to be interconnected in such a way that wastes and byproducts of each subsystem become the input of other systems and so on. There may also be intra-connections between different components within each of the subsystems.

The paddy-fish-duck azolla model

The plot is first re-designed so that a monoculture paddy-field converts itself into a polyculture plot and the rice plant is

helped to grow both with the excreta as well as the activities of ducks, fish, etc., in the fields (an example of 'close-integration'). Fish-azolla and duck may be introduced into the pond as well as in the trenches surrounding the paddy field. While releasing the fish, it is best to wait until the rice is well established. The usual waiting period is 1–3 weeks after transplanting or 4–6 weeks after direct broadcasting, or when two or three tillers have appeared. It all depends on the state of the rice and the size of the fish. The important fish used are catla, rohu, mrigul, silver carp, grass carp, common carp, etc. The fish feed on rice bran, plankton and azolla. They are larva-feeding, mollusc-feeding, or plant-eating, depending on their types. By fertilizing the field through their faecal matter, they act as a 'swimming fertiliser factory'. They also overturn the submerged soil, thus making more nutrients and oxygen available to the roots of the paddy plants, thereby acting like a 'biological plough'. One or two weeks after transplanting, ducks are introduced into the rice field. Usually the age of the seedlings and of the ducklings should be the same. In 1,296 m^2 of rice field, there should be 20–25 ducklings (if they are kept in the field day and night). The ducks stir up the mud using their feet and bills, their excreta sustains the plants and the fields are kept free from destructive snails and weeds. The ducks also consume small fish, aquatic organisms and check excessive growth of azolla within the paddy field. The ducks should be kept in the field till the flowering stage of rice. Azolla fixes nitrogen and can be incorporated in the soil. It is consumed by some fish and ducks and can also be used to feed pigs or as feed for earthworms in a vermicompost pit. It prevents harmful weeds from sprouting as it shuts out some of the light, when it covers the surface of the field.

Low-cost organic certification under PGS Commences in India

The PGS Organic India Council has approved the implementation of the PGS schem through OFAI, MOFF, Timbaktu Collective, DDS, IIRD and Keystone Foundation using the code of 8 alpha-numerals for identification of the Local Groups from April, 2007. The PGS is recognized and promoted as the alternative and scientific method of organic farm certification by both, the Food and Agriculture Organization (FAO) of the United Nations and International Federation of Organic Farming Movement (IFOAM). It is supported by the Government of India through the National Centre of Organic Farming (NCOF). The recognized farms are permitted to use the PGS organic label and logo for their produce.

In Andhra Pradesh, the growth of local groups has been phenomenal in the first six months of PGS operation. It gives IISA and OFAI a reason to smile along with all the people who want to grow and eat natural food. A major part of the credit goes to two organizations in Andhra Pradesh: the Timbktu Collective and the Deccan Development Society. The Andhra Pradesh farmers show all the other states the way forward, naturally. With Deccan Development Society operating in the Medak district of Andhra Pradesh, once represented by Smt. Indira Gandhi in the Lok Sabha, there are as many as forty "Local Groups" with 36 that have completed the formalities for registeration under PGS with PGSOIC. Each Local Group has five members from farm families. These local groups are spread across the villages of Tekur, Shamshoddinpur, Raipalli D, Pyalaram Pastpur, Mamidipalli, Khasimpur, Malgi, Kalimela, Indur, Jharasangam (V&M), Mamidpalli, Hulgera, Humnapur, Hothi, Edakulapalli, Guntamarpali, Cheelamamidi and Bidakanne in Zaheerabad Jharasangam, Munpalli, Raikode, and Nylakal Mandal (Talukas). The DDS has motivated the local groups to use easy-to-remember names for themselves. Total number of members in the forty groups is 200. Similarly other groups are also there in five states. Thus, there are 77 local groups spread over five states. The PGS label for use by some of these groups has been approved by the PGS Organic India Council. The local Groups will use the PGSOIC logo along with their 8-digit alpha numerical code as the guarantee that the product is originally produces, processed and packaged. The PGS works on peer pressure. If any product with the "Organic" label is found not conforming to the "Basic Standards", the whole local group will lose the right to use the label. (source: *The Living Field, OFAI Newsletter, August Issue Seven*)

Quality Assurance under Organic Certification Process

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Growing organic

With the spurt in demand for organically grown items in domestic and international markets and increasing realization of farmers about the long term benefits of on-farm resource based agriculture, more and more farmers are shifting towards organic farming. Efforts have also been initiated at Government level to promote the concept and to ensure quality of the organically grown products. National Project on Organic Farming (NPOF) under Ministry of Agriculture has taken up large scale initiatives to: (a) develop organic input production infrastructure, (b) develop farmers group through service providers for organic certification, (c) human resource development through trainings and demonstrations and ensure market development. National Programme on Organic Production (NPOP) under Ministry of Commerce has defined regulatory mechanism for certification of organic processes. Under the programme so far 12 agencies have been accredited. At least four agencies are in the process of being notified as accredited agencies. Put together, the initiatives taken up by these two Ministries has given a much needed boost to the promotion of organic farming. The area under organic certification process is continuously increasing. As per the data provided by 12 accredited certification agencies, a total of 8.65 lakh ha area is registered for organic certification process. Out of this 4.01 lakh ha area is full certified while remaining 4.64 lakh ha is under conversion process. State wise details of certified, in-conversion and total area under organic certification process are given in Table 1. Agency wise details of area under organic certification process are given in Table 2.

States and Crops

Madhya Pradesh, Gujarat, Maharashtra and Orissa states accounts for 67% of the total area under organic certification process. Cotton continues to be the single largest crop under organic. In Madhya Pradesh and Orissa almost entire area under organic certification process is covered under Cotton. Interestingly, although, cotton is being grown along with other cereals and pulse crops but it is only the cotton which is being certified in these states. Majority of the cotton projects are under Grower groups. The number of holdings in these groups range from 500 to 8,000. Under Service Provider scheme of NPOF also certification process is being adopted but the size of groups are generally up to 1500 farmers. Paddy, Wheat, Soybean and Red gram are other important crops in central and western India. Paddy, sesame and spices are important organic crops in Southern India. Some of the North Eastern States such as Nagaland and Mizoram has launched concentrated efforts to promote systematic organic farming approaches. The area under organic certification process in these two states have grown to 14,490 ha and 16121 ha during the year 2007-08.

Table 1. State wise details of certified, in-conversion and total area under organic certification process (as on 31.03.2008)

Sl. No.	State	Area in ha		
		Total Certified	Total under Conversion	Grand Total
1	Andhra Pradesh	9336.55	12136.43	21472.98
2	Arunchal Pradesh	53.75	985.05	1038.8
3	Assam	3284.7	1462.62	4747.32
4	Bihar	125	0	125
5	Chattisgarh	0	177.98	177.98
6	Delhi	0	0	0
7	Goa	14164.21	448.75	14612.96
8	Gujrat	7633.05	158252.44	165885.49
9	Haryana	972.12	1118.83	2090.95
10	Himachal Pradesh	0	10605.92	10605.92
11	J & K	33047.1	0	33047.1
12	Jharkhand	0	0	0
13	Karnataka	57626.24	7581.41	65207.65
14	Kerala	6961.99	4972.72	11934.71
15	Manipur	171.6	10697.992	10869.592
16	Maharashtra	45320.27	79775.58	125095.85
17	Madhya Pradesh	138320.02	75767.94	214087.96
18	Mizoram	0	16121.69	16121.69
19	Meghalaya	226	47.4	273.4
20	Nagaland	69	14421.4	14490.4
21	Orissa	42302.65	33375.85	75678.5
22	Punjab	67.3	3252.9	3320.2
23	Rajasthan	17631.007	6149.583	23780.59
24	Sikkim	172.08	0	172.08
25	Tripura	0	0	0
26	Tamilnadu	4006.2	3661.054	7667.254
27	Uttar Pradesh	4811.72	15633.06	20444.78
28	Uttrakhand	8260.607	4233.243	12493.85
29	West Bengal	6438.846	3441.234	9880.08
30	Other	0	0	0
	Total	**401002.01**	**464321.076**	**865323.086**

Table 2 Total Area under Organic Certification Process as reported by different Accredited Certification Agencies during the eyar 2007-08 (As on 31.03.2008)

Sl. No.	State	USOCA	LACON India Pvt.	INDOCERT	ROCA	Ecocert	APOF	NOCA	IMO	SGS	One Cert	CUC	Total
1	Andhra Pradesh	0	1432.83	1984	0.00	1301.78	1181.11	0	4886.66	0	340.35	10346.25	21472.98
2	Arunchal Pradesh	0	0.00	149.2	0.00	0	0	0	0	889.6	0	0	1038.8
3	Assam	0	0.00	454.12	0.00	0	20	0	908.8	963.5	0	2400.9	4747.32
4	Bihar	0	0.00	125	0.00	0	0	0	0	0	0	0	125
5	Chattisgarh	2	0.00	34.4	0.00	0	0	0	101.58	40	0	0	177.98
6	Delhi	0	0.00	0	0.00	0	0	0	0	0	0	0	0
7	Goa	0	0.00	0	0.00	66	0	0	4999.28	0	0	9547.68	14612.96
8	Gujrat	11.69	0.00	29.04	0.00	0	0	0	109.75	0	487.68	165247.33	165885.49
9	Haryana	615.88	0.00	5.3	0.00	920.6	0	0	0	199.6	0	349.57	2090.95
10	Himachal Pradesh	179.4	1000.50	0	0.00	0	0	0	49.16	0	9368.7	8.16	10605.92
11	J & K	0	0.00	0	0.00	32165.1	0	0	0	0	0	882	33047.1
12	Jharkhand	0	0.00	0	0.00	0	0	0	0	0	0	0	0
13	Karnataka	755	0.00	76.8	0.00	0	4195.74	0	3193.33	0	0	56986.78	65207.65
14	Kerala	0	539.35	6198.57	0.00	0	0	0	1077.55	0	0	4119.24	11934.71
15	Manipur	0	0.00	371.51	0.00	0	0	0	0	0	10498.082	0	10869.592
16	Maharashtra	0	1636.84	24467.6	0.00	30627.2	0	45800.66	5011.99	0	7362.42	10189.14	125095.85
17	Madhya Pradesh	2935.4	0.00	21960.4	0.00	82042	14.1	0	322	53.2	4918.26	101842.6	214087.96

Sl. No.	State	USOCA	LACON India Pvt.	INDOCERT	ROCA	Ecocert	APOF	NOCA	IMO	SGS	One Cert	CUC	Total
18	Mizoram	0	0.00	394.8	0.00	0	0	0	0	6016.6	9710.29	0	16121.69
19	Meghalaya	0	0.00	273.4	0.00	0	0	0	0	0	0	0	273.4
20	Nagaland	0	0.00	299.5	0.00	0	0	0	46.4	14144.5	0	0	14490.4
21	Orissa	0	0.00	129.8	0.00	40078.4	0	0	5470.78	0	7651.27	22348.25	75678.5
22	Punjab	20	0.00	336.6	0.00	0	0	0	0	535.6	2428	0	3320.2
23	Rajasthan	0	200.00	78.8	452.45	14896.79	0	0	37.86	624.76	7489.93	0	23780.59
24	Sikkim	0	0.00	0	0.00	0	0	0	0	0	0	172.08	172.08
25	Tripura	0	0.00	0	0.00	0	0	0	0	0	0	0	0
26	Tamilnadu	0	492.16	839.01	0.00	0	1620	16	3157.22	0	0	1542.86	7667.254
27	Uttar Pradesh	6085.6	5.00	1811.2	0.00	179	0	0	0	3376.64	6469.55	2517.79	20444.78
28	Uttrakhand	7507.87	0.00	0	0.00	2197	0	0	37.86	607.65	0	2143.47	12493.85
29	West Bengal	0	0.00	0	0.00	0	0	0	5441.96	41.68	0	4396.44	9880.08
30	Other	0	0.00	0	0.00	0	0	0	0	0	0	0	0
	Total	18112.84	5306.684	60019.05	452.45	204473.87	7030.95	45816.66	34852.18	27493.33	66724.532	395040.54	865323.086

India Organic News

Strategies and models for agricultural sustainability in developing Asian countries - The green revolution of the 1960s and 1970s which resulted in dramatic yield increases in the developing Asian countries is now showing signs of fatigue in productivity gains. Intensive agriculture practiced without adherence to the scientific principles and ecological aspects has led to loss of soil health, and depletion of freshwater resources and agrobiodiversity. With progressive diversion of arable land for non-agricultural purposes, the challenge of feeding the growing population *without*, at the same time, annexing more forestland and depleting the rest of life is indeed daunting. Further, even with food availability through production/procurement, millions of marginal farming, fishing and landless rural families have very low or no access to food due to lack of income-generating livelihoods. Approximately 200 million rural women, children and men in India alone fall in this category. Under these circumstances, the evergreen revolution (pro-nature, pro-poor, pro-women and pro-employment/livelihood oriented ecoagriculture) under varied terms are proposed for achieving productivity in perpetuity. In the proposed biovillage paradigm, eco-friendly agriculture is promoted along with *on-* and *non-farm* eco-enterprises based on sustainable management of natural resources. Concurrently, the modern ICT-based village knowledge centres provide time- and locale-specific, demand-driven information needed for evergreen revolution and ecotechnologies. With a system of farm and marine production by masses, the twin goals of ecoagriculture and eco-livelihoods are addressed. The principles, strategies and models of these are briefly discussed in this paper. (Source - Kesavan and Swaminathan Philosophical Transactions of Royal Society, Vol 363, 2008, 877-891)

Organic amendments affect biochemical properties of a subtemperate soil of the Indian Himalayas - Evaluation of suitable organic amendments is prerequisite for sustainable agricultural growth in the northwestern Himalayan ecosystem. The effect of organic amendment applications on the activity of exocellular enzymes were examined on a silty clay loam soil of a subtemperate hill-agro ecosystem. The treatments involved addition of equivalent amounts of N through mineral fertilizer (MF) and two organic inputs, composted cattle manure (CM) and vermicomposts (VC), at four different doses. Soil enzymatic activities and fertility at crop harvest were measured after continuous 3 years of application, and its residual effects were also studied. In comparison with the control, CM and VC addition increased soil organic carbon (OC) by 54% and 52% at application rate equivalent to recommended dose, respectively, whereas there was a 12% increase following MF treatment. Bulk density of CM- and VC-treated soil were 1.16 and 1.14 Mg $m^{â^`3}$, respectively, compared with 1.32 Mg $m^{â^`3}$ in control after 3 years. Dehydrogenase activity was higher in the CM treatments by 44â€“204%, and by 22â€“108% in VC treatments than in control. The addition of CM and VC caused different responses in hydrolase enzymes. Protease and cellulase activity increased in both organic treatments significantly across treatments. However, urease and alkaline phosphatase activity was more influenced by application of CM compared with VC. Î²-glucosidase activity was higher in MF treatment and was at par with the highest rate of organic amendment application. Increase in phosphatase activity is attributed to soil pH and microbial stimulation by organic C and is correlated with the increase in dehydrogenase activity ($R^2 = 0.923$). Differences in activities of all evaluated enzymes were narrowed down in residual treatments compared with control without much change in the trend. Composted CM was found more suitable for sustaining quality of subtemperate soils. (Source Saha et al 2008, Nutrient Cycling in Agroecosystems Volume 80, Number 3 : 233-242)

Organic agriculture opens up new vistas for northeast agriculture - A book on organic farming practices was released on 27th August 2008 by Rev Dominic Lumon, D.D, the Archbishop of Imphal at the Diocesan Social Service Society premises at Mantripukhri. The chief recipient of the first copy of the released book was V Vumlun Mang, IAS, secretary, Government of Manipur. Many eminent guests like Archbishop Emeritus Joseph Mittathany, scientists and officers from different government offices and Helena Bronserud Christensen, the project co-ordinator of Caritas Denmark were present on the occasion. The major officers that represented various departments were Dr. Prakash, joint director and Dr. Behara (senior scientist) of Indian Council of Agriculture Research (ICAR), Dr. Edwin, Associate Professor, Central Agriculture University, (CAU), Iroisenba, Imphal, Dr. S. Greep, Scientic Officer, Regional Centre of Organic Farming, Mantripukhri and Dev Dutta Sharma, Farm Manager, Horticulture and Soil Conservation, Manipur. Fr. Varghese Velickakam, Director of DSSS, in his keynote address highlighted the ongoing activities of the organization and its efforts towards promotion of organic agriculture in Manipur. He said that there was potential for organic agriculture in the state to bring about qualitative and quantitative production. He also mentioned that this nature friendly agriculture system provides the opportunity to our farmers to enhance their socio-economic status. Vumlun Mang, IAS, secretary for horticulture and home, Government of Manipur who was the chief recipient of the book, while acknowledging his interest in organic farming and the activities of DSSS, also encouraged the promising private entrepreneurs to participate in the upcoming summit which is to be held at Guwahati. He assured DSSS of good partnership with his department in promoting organic agriculture in Manipur. Talking in the context of Manipur he said that organic agriculture is the sunshine for Manipur. Helena Bronserud Christensen, the programme coordinator of Caritas Denmark, on the occasion thanked the government of Manipur for her PAP. She said that organic agriculture is sustainable agriculture and added that poverty among the farmers can be ameliorated to certain extent through the promotion of civil societies and organic agriculture. (Source - Kangla Online 28-Aug-08 through Electronic Organic Reference Service of ICCOA, Issue 8, August 2008)

Organic Tea - India is in the final stages of launching a project for organic tea under the aegis of the Inter-Governmental Group of the UN-based Food and Agricultural Organization (FAO). The $1.6 million project is to be funded by another UN body, the Common Fund for Commodities (CFC). The formal launch is likely to take place in mid-September, here. It coincides with a growing interest in tea as a wellness beverage the world-over. Under this project, which would have three components, India would evolve a package of farm practices which conform to organic tea cultivation. Towards this end, 100 hectares each have been given to three tea estates in Coimbatore district in Tamil Nadu, in Darjeeling district in West Bengal and in Upper Assam. Each of these estates will remain attached to a research association with which it will coordinate over the three year tenure of the project. The research bodies which will be associated are: Tea Research Association, the Darjeeling Tea Research and Development Centre and the United Planters' Association of Southern India. These estates will try out three models — uproot the entire gardens, rejuvenate it or convert existing bushes into organically cultivated ones. Thereafter, the institutes will come out with a package of farm-practices, which will then be standardised for application to all organically grown teas. As part of the project, a uniform system of certification would be evolved through empanelment of Indian agencies. The Tea Board would take the responsibility of empanelling agencies whose people would be trained in overseas schools for this purpose. This would replace the present system of a plethora of international agencies providing this certification. The project also envisages conducting a worldwide study on demand for organic tea for both black and green tea. It may be mentioned that China had already launched an FAO scheme for green tea. However, although India does produce some organic

tea, especially in Darjeeling (where 50 per cent production is stated to be through organic methods) conversion to this manner of tea production on a large scale may not be very smooth. It would need an attitudinal change as well as absorption of higher costs by at least 25 per cent. Of course, there is scope of passing this on to customers who might not mind it at all if it assures them a clean cup of their favourite morning brew which will not leave behind either any leaves or residues. (Source: The Hindu 17-Aug-08 http://www.hindu and Electronic Organic Reference Service of ICCOA, Issue 8, August 2008**)**

Great Cotton Rush – If you happen to buy an organic cotton shirt – in Delhi, London or elsewhere – don't be surprised to know that the basic raw material, seed cotton, has been procured from a non-descript Indian Village. Many farmers find organic farming a win-win situation for all the parties concerned. The income level of organic farmers have increased considerably as their input costs have come down by almost 30-40%. What's more the farmers get roughly 30% more (Rs. 500 to 700 per quintal more) for organic cotton as compared to conventional cotton. The fiber quality is also better, and all this have been chieved without making use of the genetically modified seeds (BT cotton). Many US based companies are also keen to promote organic farming in India. Bernard Chaus Inc. – a leading women's sportswear in US recently gave a financial grant of $ 47,044 (Rs. 20 lakh) to a firm in India for sourcing organic cotton. Growing certified area in Madhya Pradesh, Maharashtra and Orissa is mainly comprise of cotton crop. (Source – Hindustan Times, New Delhi, September 17, 2008).

Farming Technique from Vedas

Horticulturist of Unnao uses "Homa" to reap Pest free Mango

Four years ago, when Central Horticulture Subtropical Research Institute (CHSRI), Lucknow floated the idea of Homa Farming, some cultivators in the Mango belt of Kakori and Malihabad adopted it. However most of them gave it up having little patience to wait for reasonable period of time. But one man stuck to the process. Today, Ramesh Chandra Tiwari, a petty farmer in Unnao District is reaping the benefits and is thankful to the CHSRI. According to Mr Tiwari, the process begins early morning with a 'Havan' which is carried out at specific place at sun rise. Four resonance points replicate the energy and energize the entire area. This is believed to make the atmosphere pure and soothing before the day begins. Green manure maulching, compost, vermicompost, vermiwash and biosol among others make up for the organic sprays and fertilizers used after th prayrs. The sprays consists of the havan ashes and fertilizers-green manure and vermicompost – are prepared using a mix of green leaves, water and cow dung. They are then left to decompose for 20 days. Earthworm are also dumped in the preparation, as they are very effective in preparing organic sprays. With the application of such practices, there is no trace of pests and insects that usually afflict mango trees in peak season and destroy a major portion of the crop in this belt. Tiwari says that "when I took up homa farming in 2004, I could hardly break even and my initial investment was high. But it was one time investment and now my costs are meager – on sprinkler, vehicle and labour. The profit is increasing every year. In June 2008, Mr. Tiwari organized a fair in his mango farm and invited interested farmer, besides scientist and visitors from around the globe.
(Source – The Times of India, Bhubaneshwar – National, July 8, 2008. Contributed by Dr. R.N. Bisoyi, RCOF, Bhubanshwar)

Global Organic

Long-term organic farming fosters below and above ground biota: Implications for soil quality, biological control and productivity - Organic farming may contribute substantially to future agricultural production worldwide by improving soil quality and pest control, thereby reducing environmental impacts of conventional farming. We investigated in a comprehensive way soil chemical, as well as below and aboveground biological parameters of two organic and two conventional wheat farming systems that primarily differed in fertilization and weed management strategies. Contrast analyses identified management related differences between "herbicide-free" bioorganic (BIOORG) and biodynamic (BIODYN) systems and conventional systems with (CONFYM) or without manure (CONMIN) and herbicide application within a long-term agricultural experiment (DOK trial, Switzerland). Soil carbon content was significantly higher in systems receiving farmyard manure and concomitantly microbial biomass (fungi and bacteria) was increased. Microbial activity parameters, such as microbial basal respiration and nitrogen mineralization, showed an opposite pattern, suggesting that soil carbon in the conventional system (CONFYM) was more easily accessible to microorganisms than in organic systems. Bacterivorous nematodes and earthworms were most abundant in systems that received farmyard manure, which is in line with the responses of their potential food sources (microbes and organic matter). Mineral fertilizer application detrimentally affected enchytraeids and Diptera larvae, whereas aphids benefited. Spider abundance was favoured by organic management, most likely a response to increased prey availability from the belowground subsystem or increased weed coverage. In contrast to most soil-based, bottom-up controlled interactions, the twofold higher abundance of this generalist predator group in organic systems likely contributed to the significantly lower abundance of aboveground herbivore pests (aphids) in these systems. Long-term organic farming and the application of farmyard manure promoted soil quality, microbial biomass and fostered natural enemies and ecosystem engineers, suggesting enhanced nutrient cycling and pest control. Mineral fertilizers and herbicide application, in contrast, affected the potential for top-down control of aboveground pests negatively and reduced the organic carbon levels. Our study indicates that the use of synthetic fertilizers and herbicide application changes interactions within and between below and aboveground components, ultimately promoting negative environmental impacts of agriculture by reducing internal biological cycles and pest control. On the contrary, organic farming fosters microbial and faunal decomposers and this propagates into the aboveground system via generalist predators thereby increasing conservation biological control. However, grain and straw yields were 23% higher in systems receiving mineral fertilizers and herbicides reflecting the trade-off between productivity and environmental responsibility (Source **-** Birkhofer et al Soil Biology and Biochemistry Vol 40 (9), 2008 : 2297-2308)

Effects of organic farming on weed flora composition in a long term perspective - In 1987, the Ekhaga Experimental Farm in Sweden was established on a site that previously had been subjected to conventional farming, and has been managed since then as an organic farm. To study the effects of organic farming on weed population development and crop yields, two different crop rotations were designed, one adapted for animals (six fields) and one without animals (six fields). Each field contained a fixed 1 m^2 reference plot in which all the weed observations were done each year. During the period 1988–2002, number of weed plants in spring and weed biomass at harvest were recorded in the reference plots. No differences in these two parameters were observed between the crop rotations. Number of weed plants in

spring did not differ between annual crops and did not increase over the 15-year period. Neither did weed biomass at harvest nor weed species diversity change over the 15 years. The two crop rotations kept weed pressure at the same level as under the previous conventional farming practice. General field observations suggest that invasion of *Cirsium arvense* (L.) Scop. is occurring along the field borders. Competitive ability of the crop showed to be important in weed regulation. Peas, a weak competitor, had significantly higher weed biomass at harvest compared with oats and winter wheat. Weather conditions during the period from April to September caused weed occurrence and development through the season to vary between years. To improve weed management in organic farming, advisors and farmers should recognise the importance of individual field and farm analyses to design location-specific, farm-adapted crop rotations (Source – Lundkwist et al European Journal of Agronomy Volume 28, Issue (4) 2008 : 570-578)

Organic Crops Impressively Productive When Compared With Conventionally Grown Crops - Can organic cropping systems be as productive as conventional systems? The answer is an unqualified, "Yes" for alfalfa or wheat and a qualified "Yes most of the time" for corn and soybeans according to research reported by scientists at the University of Wisconsin-Madison and agricultural consulting firm AGSTAT in the March-April 2008 issue of Agronomy Journal. The researchers primarily based their answer on results from the Wisconsin Integrated Cropping Systems Trials, conducted for 13 years (1990-2002) at Arlington, WI and 8 years (1990-1997) at Elkhorn, WI. These trials compared six cropping systems (three cash grain and three forage based crops) ranging from diverse, organic systems to less diverse, conventional systems. The cash grain systems were: (a) conventional continuous corn, (b) conventional corn-soybean, and (c) organic corn-soybean-wheat where the wheat included a leguminous cover crop. The three forage based systems were: (1) conventional corn-alfalfa-alfalfa-alfalfa, (2) organic corn-oats-alfalfa-alfalfa, and (3) rotationally grazed pasture. In this research they found that: organic forage crops yielded as much or more dry matter as their conventional counterparts with quality sufficient to produce as much milk as the conventional systems; and organic grain crops: corn, soybean, and winter wheat produced 90% as well as their conventionally managed counterparts. In spite of some climatic differences and a large difference in soil drainage between the two sites, the relatively small difference in the way the cropping systems performed suggested that these results are widely applicable across prairie-derived soils in the U.S. upper Midwest. The researchers also compared their results to other data analysis done on this topic in the U.S. Midwest. Although researchers found that diverse, low-input/organic cropping systems were as productive as conventional systems most of the time, there is a need for further research, according to the study's author Dr. Joshua L. Posner, University of Wisconsin. "There continues to be improvements in weed control for organic systems that may close the gap in productivity of corn and soybeans in wet seasons," Posner says. "On the other hand, technological advances may accelerate productivity gains in conventional systems that would outstrip the gains in organic systems even in favorable years." The true question of whether organic cropping systems are as productive as conventional systems is a dynamic question and one that requires continual reevaluation. (Source – *Science Daily Mar. 26, 2008)*

Re-thinking the Transformation of Organics: The Role of the UK Government in Shaping British Organic Food and Farming - The focus of international scholarship on the contemporary transformation of organic food and farming has been a rather narrow preoccupation with the conventionalisation thesis that describes a process whereby the structure and ideology of the expanding organic sector is seen increasingly to resemble that of the conventional food and farming sector that it has traditionally opposed. This study seeks to contribute to this literature by examining the role of the UK government in shaping the British organic sector since 1980, when it first

began to engage seriously with organic farming. It draws on the analysis of a wide range of government and organic movement publications for the period 1980 to 2006, as well as a programme of semi-structured interviews with key organic policy actors during this time frame. By analysing the way in which the UK government has discursively constructed three separate story-lines about organics, this study argues that the effects of government action on British organic food and farming are best described as a process of containment. Further, it posits the need to move on from the rather reductionist focus offered by the conventionalisation thesis to more nuanced approaches to the transformation of contemporary food and farming that account for different geographical contexts, and the particular roles of different actors actively constructing what "organics" is (Source - Isobel Tomlinson 2008, Sociologia Ruralis 48 (2) 133-151).

New Natural herbicide find from fescue - Certain varieties of common fescue lawn grass come equipped with their own natural broad-spectrum herbicide that inhibits the growth of weeds and other plants around them. Cornell researchers have identified the herbicide as an amino acid called meta-tyrosine, or m-tyrosine, that these lawn grasses exude from their roots in large amounts. Reporting on the discovery in the Proceedings of the National Academy of Science, Frank Schroeder, the paper's senior author and an assistant scientist at the Boyce Thompson Institute for Plant Research on Cornell's campus, said, "We at first didn't believe m-tyrosine had anything to do with the observed herbicidal activity, but then we tested it and found it to be extremely toxic to plants but not toxic to fungi, mammals or bacteria." While m-tyrosine itself is too water soluble to be applied directly as a herbicide, this research may lead to development of new varieties of fescue grasses that suppress weeds more effectively, which could reduce the need for synthetic herbicides, said Schroeder. By increasing our understanding of basic plant biology, the discovery of m-tyrosine's herbicidal properties could also help researchers discover more sustainable ways to control weeds or completely new herbicides, Schroeder added.Schroeder and colleagues are also trying to understand why fescue grasses do not succumb to the toxin themselves. They found that when phenylalanine was added to plants dying from m-tyrosine exposure, they recovered. As a result, the researchers suspect that these fescue varieties may overproduce phenylalanine to save themselves from their own toxin. People have not recognized how effective some fescue varieties are at suppressing weeds because m-tyrosine production appears to be highly dependent on environmental conditions, Schroeder said, which is another area that the researchers are currently investigating.
(Source - www.sciencedaily.com, posted by Mahidi Ebrahimi, November 2007).

Natural fumigants from Brassica species- Some Brassica species such as mustard, radish, or rapeseed have been identified to manage soil-borne pests and weeds. Brassica plants naturally release compounds such as isothiocyanates (ITCs), which most people would recognise as the 'hot' flavour in mustard or horseradish that suppress pests and pathogens, says CSIRO's Dr John Kirkegaard. When ITCs are released in soil by green-manuring, soil-borne pests and pathogens can be suppressed and the yields of solanaceous vegetables such as potatoes, tomatoes and eggplants can be increased by up to 40 per cent in some cases. The technique is relevant to developed countries seeking alternatives to banned synthetic pesticides such as methyl-bromide, as well as poor farmers in developing countries who often have few alternatives for controlling serious diseases in their crops, Dr Kirkegaard says. The technique can also be an effective tool under organic management practices. Australian scientists are at the forefront of this area of research, in projects on tropical vegetable production systems in north Queensland and the Philippines, supported by the Australian Centre for International Agricultural Research (ACIAR), and using voluntary contributions from industry and matched funding from the Australian Government.
(Source – www.sciencedaily.com, July 28, 2008)

National and International Events

India Organic Trade Fair cum International Congress, November 27 – 30, 2008 - India Organic Trade Fair-cum-International Congress co-organized jointly by ICCOA-NCOF-APEDA and IFOAM is a platform for organic stakeholders to showcase the advancement of organic agriculture, newer technologies, products, processes and its derivatives. It Invites participation from the world of organic agriculture with a broad spectrum of stake holding groups as this trade fair has been playing a crucial role in accelerating the growth of business as well as brand building by establishing a link for the trading community across India and World as well. A meeting ground for businessmen, technocrats, entrepreneurs, manufacturers, exporters, suppliers, importers, distributors, service providers amongst others. Each edition of the fair turned out to be more successful than the preceding fair. The venue of the programme is famous Mela Ground, IARI, PUSA Campus, New Delhi. India Organic 2008 Trade Fair is associated with International Seminar, B2B Meetings, Organic Food Festival and Cultural Events For more information contact: International Competence Centre for Organic Agriculture (ICCOA) 951 C, 15th Cross, 8th Main, Rajarajeshwari Nagar, Bangalore-560098, India Phone: 80-28600935/28601183 Email: info@iccoa.org Web: www.iccoa.org or www.indiaorganictradefairs.com.

BioFach India – International Organic Trade Fair, April 29-May 1, 2008 - India's agriculture has long-lasting traditional links to organic farming. Nature friendly farming systems such as mixed farming, mixed cropping and crop rotation have been practiced in India for generations. The variety of climate zones enables this large subcontinent to grow an outstanding selection of products from teas and coffees, to spices, nuts, fruits, grains and vegetables. Several states in India have either declared themselves as organic states or are promoting organic farming and production vigorously. India is also one of the fastest growing economies in the world. In India's mega-cities like Mumbai and Delhi this is leading to higher purchasing power and to consumers aiming to select higher quality in their daily food and personal care consumption. Organic food trade is fast coming up as upcoming market. BioFach India offers prospects for India to become a key market for organic products. Producers from India and international suppliers are invited to show case their organic products in Mumbai from 29 April to 1 May 2008 at Bombay Exhibition Centre. The first edition of BioFach India is being organized by Nuremberg Messee, Germany in collaboration with ICCOA, Bangalore and IFOAM. Admission criteria to BioFach India is the same as that of mother fair BioFach Germany. Exhibitors have to meet the admission criteria set by the organizers. Products certified under NPOP and certified by any of the accredited agencies under NPOP shall be eligible for entry into BioFach India. For further details contact Indo-German Chamber of Commerce German House, 2, Nyaya Marg, Chanakyapuri New Delhi 110 021 (India) Ms. Tanu Ailawadi Phone: +91 11 2687 87 21, email tanu@indo-german.com

1st International IFOAM Conference on Animal and Plant Breeding -BREEDING BIODIVERSITY - Both organic plant and animal breeding are in early phases of development, although they share a great deal in common, primarily socioeconomic aspects, but also genotype-environment interaction, genetic diversity and robustness. Each field can inspire the other to develop and build upon successful strategies. Even though technical aspects may differ dramatically, organic farms ideally utilize integrated systems, and bringing both animal and plant breeding together in one international conference explicitly highlights the important interdependences and holistic approach of organic agriculture, while maximizing the use of limited resources to bring together a diverse constituency that

shares common goals. The conference will be divided into three sections: (a) Technical aspects (Breeding techniques, Methods, Genotype environment interaction, Selection criteria, Breeding for farmers vs. hobby gardeners) (b) Socio Economic aspects (Participatory approach, Financing, Indigenous knowledge, Gender) and (c) Legal aspects (Registration, Intellectual Property Rights, Farmers Rights). The conference will take place in Santa Fe, New Mexico, in the central part of the US.Conference website: http://www.ifoam.org/events/ifoam_conferences/ 2009_ animal_ and _plant_breeding/animal_plant_breeding.html

BioFach America 2008 Boston, MA Trade Show is scheduled for October 16-18, 2008. BioFach - producers of Europe's largest organic exhibition - and New Hope Natural Media - producers of North America's largets natural and organic products trade shows - have partnered to produces North America's largest all-organic and natural show. With more than 20,000 attendees, there is no other show in the United States that allows one to talk to so many potential customers. Organic Products Expo-BioFach America delivers cutting-edge organic finished products, raw materials, market intelligence and education that trade who and conference attendees can't find anywhere else in North America. Located at Natural Products Expo East, the all-organic Organic Products Expo-BioFach America delivers the largest retail-buying audience in the United States. (For details visit **www.ifoam.org**)

BioFach Japan 2008 Tokyo Big Site September 24-26, 2008 - BioFach Japan is Asia's leading trade fair for organic products. For the last six years, BioFach has been the one and only organic trade show with strict criteria and the passport to the Japanese organic market. It offers excellent business opportunities for Japan's growing consciousness for a healthy lifestyle. BioFach Japan is the meeting point for organic supply and demand. BioFach Japan invites stakeholders to: (a) export your organic products to Japan (b) create brand awareness (c) introduce yourself as a supplier (d) underline your commitment to the organic movement and (e) establish and deepen your business ties For further information, contact: BioFach Japan Secretariat c/o ABC Enterprises, Inc. Fukide Heights 305 Toranomon 4-1-11, Minato-ku Tokyo 105-0001 Japan Mr. Heinz Kuhlmann Tel: +81-3-5404-7351 Fax: +81-3-5404-7352 Email: heinz@inter.net

Natural & Organic Products Exhibition, Cape Town/South Africa 2008 - The Natural and Organic Products Exhibition caters for environmentally aware, intelligent consumers and trade representatives looking for sustainable solutions to suit their changing life style and work style requirements. Key concerns are health, safety and the environment which are driving consumers to be more informed and to make better choices. For further details contact Exhibition Director: David Wolstenholme Exhibition Manager: Janine Johnston PO Box 23107, Claremont, 7735, 16 Thistle Street, Fernwood, Newlands, Cape Town, 7700, South Africa Tel: +27 21 671 0935, Fax: +27 21 671 0176**,** E-mail: info@specialised.com

International Seminar on Sustainable Utilization of Tropical Plant Bio-mass in Kerala State, India – is scheduled for August 29, 2008) On December 15 and 16 2008, the 'International Seminar and Workshop On Sustainable Utilization of Tropical Plant Bio-mass' takes place in Thiruvananthapuram, Kerala State in India. It is organised by the University of Kerala and the Kerala Agricultural University in cooperation with other agricultural research institutions. The aim is to present a platform for discussing sustainable utilization of the tropical plant bio mass addressing not only to the day to day needs of the human beings regarding food, shelter, health and social well-being but also covering aspects of biodiversity, environmental hazards and climatic changes in a long term perspective.

Natural Ingredients 2008 – is scheduled at Paris Nord/Villepinte, France November 4-6 2008, Natural ingredients (Ni) 2008 is the annual event for buyers, sellers and product developers of natural food ingredients, cosmetics, medical remedies,

beauty products and nutraceuticals. At the Organic Pavilion, a dedicated area on the show floor focused on the booming organics market, companies from Europe, Asia and North America as far away as Canada will be featuring their organic ingredients to the thousands of visitors. In 2008 Ni is co-located with Health ingredients (Hi) Europe. Hi Europe is the largest meeting place in Europe for buyers and sellers of a full range of health ingredients. For further details visit Internet www.ni-events.com

28th Guleph Organic Conference – is scheduled for January 22-25, 2009 at Guleph University Centre, University of Guelph, Guelph, Ontario, Canada. This year's theme: "O" is for Opportunity. This four-day event will feature over 150 booths, workshops, seminars and expert panels. For further details contact Cathy Nesbitt, 43 Thornton Avenue, Bradford Ontario Email: cathy@cathyscomposters.com, Phone: 1-888-775-9495 Web Page URL: http://www.cathyscomposters.com/

Eastern Rajasthan Agricultural Science Fair and Agriculture Industries Exhibition-2008, 27 to 29 September, 2008. Lupin Human Welfare and Research Foundation jointly with Indian Agricultural Research Institute and in collaboration with Government of India, Government of Rajasthan, Public and Private sectors, propose to organize a 3 days Eastern Rajasthan Agricultural Science Fair and Agriculture Industries Exhibition-2008 at Gramin Haat campus, Bharatpur. As per the details provided by the organizers the event is to provide first hand information on the latest technologies and interventions in the field of agriculture, animal husbandry and rural livelihood. The theme of the exhibition is “Rajasthan Marches Towards Higher Productivity and Commercialization” For further details contact Lupin Human Welfare and Research Foundation, 160 Krishna Nagar, Bharatpur-321 001, Phone 05644-23023.

Workshop-cum-Training Program on Organic Farming and Certification in North Eastern States – North Eastern Region of India is strategically important as it has international borders with Bangladesh, Bhutan, China, Myanmar and Tibet. The area is characterized by rich bio-diversity, heavy precipitation and high seism city. It is endowed with forest wealth and is ideally suited to produce a whole range of plantation crops, spices, fruits and vegetables and flowers and herbs. mostly organic by tradition. According to government figures, of the net cultivated area of 4.3 million hectares, around 30.92 lakh hectares have never seen the use of chemical or inorganic fertilizers. Conscious organic farming has suddenly picked up across Assam, especially among those cultivating ginger, turmeric, oranges, black pepper and pineapples. The focus is on recognizing the dynamics of organic agriculture, indigenous knowledge and enhancing capacities of Govt. Department Official /Field Functionaries/Farmers. Recently ICCOA initiated a series of training programs with the objectives of : (a) To create awareness about Principles of Organic agriculture (b) Train on Soil and Fertility management. (c) Train on production of various organic manures /organic inputs. (d) Certification, Standards Regulation and ICS (Group Certification Program) (e) Marketing and organization building and (f) Organic farm visit. Four such training programs had been conducted one each in Nagaland, Manipur, Mizoram and Meghalaya during August and September 2008.

Launching of Local Certification System Based on PGS Spirit - JATAN : A Mission for Organic Farming is active in since long to promote Sajiv Kheti (organic farming) in Gujarat since 1985. With intensive efforts of JATAN and in collaboration with Organic Farming Association of India, a unique system of certification system has been launched. Jatan has developed a ‘Microsoft Office_Excel’ based Computer Programme to evaluate the “Organicity” (a measure in percentage - to check, up to what extent the organic farm is really “organic”) of the organic farms. The programme also generates certificate automatically. The uniqueness of this evaluation cum certification system includes bottom–up approach for organic certification, development of organic standard after series of consultations with farmers group at

regional level, farms will be appraised (not inspected) by genuine organic farmers of the same region who are democratically selected by farmers groups and trained by Jatan. The system is a holistic approach to the real principles of organic farming aiming at sustainability, social justice and producing healthy food (not just a guarantee to consumers for chemical-free food). It is an effort towards quality assurance to domestic consumers with education and transparency.

The system was formally launched on 20th Sept. 2008 in in a one day event at Gujarat Vidyapith, Ahmedabad. Main **Objectives of the even were:**

1. To take an account of Sajiv Kheti movement in Gujarat.
2. To raise awareness about evaluation and certification of Sajiv Kheti farms.
3. To understand various pros and cons of different organic certification systems.
4. To distribute certificates to some sajiv kheti farmers based on Jatan's "Sajiv Kheti Evaluation & Certification System".
5. To make demonstration on "Sajiv Kheti Evaluation & Certification System".
6. To share information about scheme available by Govt. agencies to promote organic farming. 6. To share views related to contemporary issues like "Climate change and organic farming" as well as "Biotechnology and organic farming".
7. To share information about research findings & scope of research in Sajiv Kheti.
8. To share information about scheme available by Govt. agencies to promote organic farming. 6. To share views related to contemporary issues like "Climate change and organic farming" as well as "Biotechnology and organic farming".
9. To share information about research findings & scope of research in Sajiv Kheti.

The event was inaugurated by Mr. P. N. Roychowdhury, Principal Secretary, Agri & Co-operation, Govt. of Gujarat, Gandhinagar. Important speakers during the event were: Shri Bhaskarbhai Save,Pioneering Organic Farmer of India, Dr. A.K. Yadav, Director and Head, National Centre of Organic Farming, Gaziabad (UP), Mr. D.V. Raidu (IAS), Project Coodinator, Society for Elimination of Rural poverty(SERP),AP, Dr. Ramanjaneyulu, Executive Director, Centre for Sustainable Agriculture, Hyderabad, Dr. R.A. Sherasiya,Director, Gujarat Organic Products Certification Agency, Dr. Rajendra Khimani, Trustee, Jatan, Vadodara and Registrar, Gujarat Vidyapith, Ahmedabad.

State Level Workshop on Organic Farming in West Bengal – Department of Agriculture, Government of West Bengal propose to organize a two days "State Level Workshop on Organic Farming in West Bengal" during 23-24 October 2008 at Bhasha Bhavan, National Library, Kolkata. The programme will include discussion on various issues viz. the current agricultural scenario of India with special reference to West Bengal, the scope and possibilities of organic farming, economics of organic farming, institutional support measure, discussion on best practices and their successful replication and financial and policy support measures that the state Government should offer to the farmers interested in organic farming. According to Dr. S.P. Chatterjee, Director of Agriculture, the workshop will also be an appropriate forum for farmers, academicians, policy makers and those engaged in organic movement to discuss the practical concerns faced by the organic farmers from production techniques to certification and domestic and export markets. The different sessions will cover eco-friendly agriculture, sustainable farming and gradual adoption of organic farming in West Bengal, particularly in rainfed regions having resource poor farming community depending on agriculture for their livelihood. For furher details and participation contact Director of Agriculture, Government of West Bengal, Writers Building, Kolakata – 700 001, Phone 033-22145856.

National Conference on Organic Farming in Horticultural Crops with Special Reference to Plantation Crops – Indian Society for Plantation Crops and Central Plantation Crops Research Institute, ICAR, Kasargod, Kerala, propose to organize a 4 days conference on "Organic Farming in

Horticultural Crops with Special Reference to Plantation Crops" during 15-18th October 2008at Kasargod, Kerala. The theme of the conference is "Promoting Organic Horticulture for Safe Food and Healthy Environment". The main issues related to the production, technological achievements in the organic production front, market situation, including outlets, logistics, certification and standards and outlook for organic horticultural products and on ways in which India can take advantage of potential market opportunities will be covered. The conference also aims to analyze the constraints and to overcome in order to successfully produce and export organic horticultural products. The conference also showcases innovative regional examples of grassroots and private sector initiatives in the field of organic horticulture.

National Workshop on Climate Change and Sustainable Agriculture – Centre for Sustainable Agriculture, Hyderabad, Jatan Trust, Baroda and OXFAM India, New Delhi jointly propose to organize a two days National Workshop during 3-4th November 2008 at Delhi. The objective of the workshop is to try and create a clearer, collective understanding on the potential that sustainable agriculture holds in the era of climate change world over in general and India in particular. Main issue to be addressed during the workshop will be: (a) climate change, (b) green house gas emissions in the intensive agricultural models, (c) the impact of climate change on Indian Farming, (d) energy economics of organic farming and (e) the mitigation and adaptation potential of sustainable agriculture in the context of climate change. For further details contact GV Ramanjaneyulu, Executive Diorector, Centre for Sustainable Agriculture, 12-13-445, Street No. 1 Tarnaka, Secundarabad-500 017, Phone 040-27017735. Email csa@csa-india.org.

Horti Expo-2008 – A three days Horti Expo-2008 is being organized by Indian Society of Agribusiness Professionals (ISAP) concurrently with 3rd India Horticulture Congress during 6-9 November 2008 at Orissa University of Agriculture and Technology campus, Bhubaneshwar, Orissa. Organic Agro and Rural Industry and Organic farming and food and biotechnology are also important theme to be demonstrated during the Expo. For further details contact Horti Expo Secreteriate, ISAP, R-289A, Greater Kailash, New Delhi – 110 048, Phone 011-41630967, Email ved@isapindia.org.

Organic ASIA - The Way Forward Innovations, Challenges and Collaboration for the Future! – A two days Organic Asia Conference is scheduled for 28-31 October 2008 at Sarawak Cultural Village, Kuching; Malaysia The conference is organized in collaboration with IFOAM, UNCTAD and the International Task Force for harmonisation and equivalence in organic agriculture (ITF). The conference is proposed to show case:

- Innovations in Production, Processing and Market development in the region
- Provide input on Best Practice for Organic Policy and Building Sustainable Organic Sectors in collaboration with UNCTAD and IFOAM
- Host policy framework and public - private sector partnerships discussions between stakeholders
- Facilitate action planning on harmonisation in organic norms and collaboration in certification to facilitate trade in organic products within the Asia region.

Conference input will include recommendations of the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) panel issued in mid-April, calling for a U-turn in agricultural production methods, emphasizing organic agriculture as a key sustainable production system. Also the relevance of organic agriculture to climate change mitigation and adaptation as well as achievement of our Millennium Development Goals. For further details contact - Rosalind Wong/Marcella Gider
Tel : 082-415484 / 416484
Fax : 082-412799/ 419799
Email : rwong@sdi.com.my

Book Reviews

Handbook of Organic Farming and Organic Foods with Vermi-Composting and Neem Products. New Delhi, Engineers India Research Institute, 2007, xx, 572 p., tables, (pbk). ISBN 81-89765-05-1.- In this handbook almost all the aspects related organic farming are covered with a balanced approach. The author demonstrates the newness of the organic concept for readers. This will help the readers to discover easily the philosophical and technical differences between organic and conventional (synthetic input dependent) farming systems." Total 30 chapters has been included in this book under the categories viz 1. Introduction. 2. Organic farming-principles and concepts. 3. Cycle for survival. 4. Organic farming. 5. Soil environment and plant growth. 6. Soil organic matter and Humus. 7. In-Situ manuring. 8. Ex-Situ manuring. 9. Production of compost. 10. Vermi-composting. 11. Ecological pest management. 12. Neem. 13. Utilization of neem. 14. Patents on neem. 15. Neem in medicine. 16. Preparation of neem products and their uses. 17. Neem in pest control. 18. Neem as a fertilizer. 19. Synonyms and properties of Neem. 20. Adoption and success. 21. Economics and marketing. 22. Organic food and organic farming. 23. Certification of organic food. 24. Specifications of organic food. 25. Principles of organic production. 26. Permitted substances for the production of organic foods. 27. Minimum inspection requirements and precautionary measures under the inspection or certification system. 28. Soil for cultivation. 29. Biogas generation and organic farming. 30. Waste water treatment and organic farming.

Integrated Nutrient Management for Sustaining Crop Productivity and Soil Health/Subhash Chand. Lucknow, International Book Distributing Co., 2008, viii, 110 p., ISBN 81-8189-231-3.- The book is a compilation of best integrated nutrient management strategies for suggesting answers of various soil and crop related problems, like disparity in NPK consumption, imbalance use of fertilizers, decreasing Soil Organic Carbon (SOC) stock and decreasing factor productivity etc. The book suggested appropriate and best INM options for important crops, viz., rice, wheat, sorghum, maize, pearl millet, soyabean, groundnut, sunflower, cotton, mustard, sugarcane, pulses, vegetables, spices, fruit crops and ornamental plants besides important cropping systems of the country for sustaining their productivity on one hand and maintaining soil health for future generation on the other hand. The book also cover a part of ICAR syllabus of PG and Doctoral Degree courses of soil science. For better understanding of students and researchers some comprehensive and detailed information about soils and crop are provided through appendices. The INM production recommendations and practices given in the book will be very useful for farmers, agriculturists, agronomists, soil scientists, environmentalists, agricultural, extension workers, researchers, students, research institutions etc. The book contains 200 INM options covering important crops and cropping systems prevailing in various states for ensuring food security.

The World Of Organic Agriculture - Nearly 31 Million Certified Organic Hectares Worldwide: IFOAM, FiBL and SÖL present new facts and figures about the organic sector at BioFach 2008 Presented for the ninth consecutive year, The World of Organic Agriculture: Statistics and Emerging Trends 2008 includes chapters reviewing organic agriculture worldwide, numerous illustrations and graphs, and completely revised reports about the emerging trends and regional development highlights on each individual continent, the study includes a comprehensive annex with the entire data set and expanded coverage of commodity specific data. (www.ifoam.org)