

# Challenges for organic and IPM farmers in Senegal

PAN Africa works with small-scale vegetable farmers trained in organic and integrated pest management looking to improve marketing options. Marie Suzanne Traoré reports on findings from a recent survey of smallholder experiences in growing and marketing vegetables with reduced or zero pesticide inputs.

Since 2005 the Pesticide Action Network Africa (PAN Africa) has been working to improve market options for Integrated Pest Management (IPM) and organic growers and to promote local consumer interest in and demand for safer and healthier produce [PN79 10-11]. Currently this programme is addressing how to best 'add value' to products sold in local fruit and vegetable markets. This project has three objectives: data collection amongst farmers trained in IPM and organic methods in the Niayes area; developing and defining criteria for a produce labelling system; and awareness raising amongst consumers and policy makers on the importance of organic and IPM production systems.

## Training organisations

During 2008 PAN Africa conducted a survey and mapping exercise of farmers who had been trained in IPM and/or organic techniques to identify: the main reasons why particular farmers were applying, or not, the knowledge they had acquired in training; problems experienced in growing with reduced or zero pesticides; market outlets. A survey form was sent out to different NGOs, government agencies and farmer associations, which identified five main

organisations involved in IPM or organic training:

- Agrécol Afrique, an NGO promoting organic agriculture in West Africa
- the Senegalese Association for the Promotion of Organic and Biodynamic Agriculture (ASPAB), created over 20 years ago by peasant farmer associations and now established as an independent NGO
- ENDA-ProNat which works to promote healthy and sustainable agriculture through reducing agrochemical inputs and the regeneration of local natural resources
- FAO's local programme of Integrated Pest and Production Management (IPPM), part of their West African Farmer Field School training programme in Benin, Burkina Faso, Mali and Senegal
- PAN Africa itself which has run training programmes for IPM in cotton and vegetables

Interviews with these training organisations revealed a total of 2,633 horticulture growers trained between 1994 and 2008. Of these, 2,580 were trained in IPM and 53 in organic agriculture in the Niayes area of Dakar and Thiès. All the trained farmers are now grouped in seven farmers' associations covering 27 villages.

**Table 1. Pest control products used by organic farmers**

Products	Frequency (%)
Neem extract	59
Biobit	12
Pepper extract	8
Tomato leaf extract	3
Tobacco leaf extract	3
<i>Caccia occidentalis</i> extract	3
Garlic extract	3
<i>ndjandame</i> * extract	3
<i>ndinate</i> * extract	2
<i>kheu kheum</i> * extract	2
Horse urine	1
Salt solution	1

\*Local plants

## Organic farmers' experiences

Of the 2,580 trained farmers a representative sample of 315 was selected for individual questionnaire surveys. Among these 315 farmers, 51 had been trained in organic farming alone and 80% of these stated that they did apply organic techniques on their farm. Roughly half of the trained organic farmers are women. 63% of the organic farmers cultivate less than one hectare. Pests and diseases are one of the problems facing organic farmers in this region which can cause serious losses. Organic farmers identified seven main pests in order of importance: nematodes; caterpillars; aphids; grasshoppers and crickets; termites; whitefly; and rodents. When questioned about their crop protection methods, organic farmers interviewed identified 12 different products used to control pests and diseases (Table 1).

All these are home-made products, with the exception of the *Bt*-based biopesticide Biobit which is available in most pesticide retail outlets. Neem extract is the product most used by organic farmers. The neem tree is present throughout Senegal, accessible to all, and so does not present a major cost as almost all parts of the tree (seeds, leaves, bark) can be used for crop protection purposes, although farmers recognise that different plant parts vary in their efficacy. Biobit is the only biological product formulated commercially by the agrochemical industry and easily available to farmers. This is why it is the second most widely used pest management product in organic farming in Senegal. The other botanical extracts, such as extract of pepper, tomato and tobacco leaves, are less used since they are not available in all localities or they cost more than most farmers are willing to pay.

The main problems facing the organic farmers interviewed are: lack of good quality seed; neem seed is only available at cer-



Survey of producers in Niayes

Photo: PAN Africa

tain times of year; availability of organic matter for compost; maturation time of organic crops; pest attacks from neighbouring conventional farms; knapsack sprayer contamination with synthetic pesticides.

Lack of good quality vegetable seed poses a serious problem for good application of organic practices as vegetable crops grown tend to be less resistant to pest attack and often yield poorly without synthetic agrochemical inputs. Availability of certified seed is another issue - the national seed industry offers an extremely limited range of seed varieties suitable for organic production and these are often hard to obtain.

Neem seed extract plays an important role in organic farmers' pest management strategies, however, seed is only available from March to June and outside this period farmers must use less effective extracts made from leaves or bark.

Compost is an essential component for organic farming. However, in the Niayes area organic matter suitable for compost mainly comprises animal manure, which is not available for most vegetable farmers who do not own any livestock. They therefore buy animal manure from livestock owners at 300 CFA<sup>1</sup> (£0.40) per kg or 1500 CFA (£2.03) per cartload. This additional cost limits the amount of land they are able to cultivate organically with volumes of compost sufficient for good organic production. The lack of transport for bulky organic matter and for water needed to make good compost is also a constraint.

In terms of the cropping period, organic farmers complained that often their fruit and vegetables take far longer to reach harvest than those of conventional growers, who can often produce two harvests in the season.

Organic farmers with fields next to conventional neighbours described how their fields are often affected by pests which appear after their conventional neighbours have sprayed their fields. Furthermore, pesticide drift can contaminate their organic produce.



IPM plot in the the Niayes Zone

Photo: PAN Africa

Another problem is that most horticulture smallholders do not own their own spray equipment and borrow from other farmers and so risk using equipment which has been used to spray synthetic pesticides.

### Marketing organic produce

The main crops grown by organic farmers are cabbage, onion, aubergine, tomato and lettuce, along with 12 other crops grown in minor quantities. Hibiscus and nana (*Mentha spicata*), an aromatic plant, are also important, either in terms of good yields or because they are fairly resistant to pest attack. Organic produce is sold in five main sales outlets. Choice of marketing outlet depends on the probability of sale, proximity to collection points and prices offered. More than half of the organic farmers interviewed sell their products in the main market in Thiès. Although this is not specifically for organic produce, it is the busiest in the region and supplies a large number of customers. The second most common marketing outlet is through bana-bana traders who buy produce at the farmgate.

According to the farmers interviewed, these traders prefer their organic produce in quality terms and particularly because it stays fresh for longer than conventionally grown produce. The traders are therefore willing to come and buy at the farmgate, which helps farmers to avoid transport costs. A third group of farmers sell at Keur Abdou Ndoye, the largest wholesale outlet along the Niayes road. A minority of farmers prefer, in contrast, to go themselves to the centre of Dakar city to sell their produce in the Kermel market where prices are a little higher than in other markets. The small weekly organic market in Thiès is only accessible to farmers trained by Agrécol, in order to guarantee produce traceability to consumers. A last group of farmers also supply on order to certain restaurants.

Organic farmers highlighted the lack of recognition or understanding of organic produce among clients. Either through ignorance or through lack of concern, most traders or consumers only consider size and external appearance of fresh produce. This leads to organic farmers having difficulties when negotiating with clients on prices as organic produce tends to be smaller in size than conventional. The lack of market outlets specifically for organic produce is another problem: the Thiès organic market is unknown by most customers and offers only a small selection of fruit and vegetables. Competition with conventional produce occurs as in all markets organic produce is sold at the same price as conventional. In an attempt to avoid losses from unsold produce, organic farmers feel obliged to sell their produce at the same price as conventional. Also some farmers reported that they may wait for several days without selling their total produce volume and with the lack of any cool storage this can lead to high losses. Transport is difficult during the winter when the roads are in bad condition. 35% of organic farmers use carts to reach the sales points, while 65% use public-transport or taxis. Price per sack varies between 200 to 400 CFA (£0.27 to



Surveying in the Niayes Zone of Thiès, Senegal.

Photo: PAN Africa

£0.54) by cart and 500 to 1000 CFA (£0.68 to £1.36) in taxis or bus.

A minority (20%) of farmers trained in organic methods said they do not apply the training received. The main reason (43% respondents) is due to the poor yields obtained through organic methods. Without use of artificial or synthetic agrochemicals and the lack of readily available organic matter, yields are very low compared with conventional systems. While organic trained farmers are aware of the benefits in terms of reduced production cost and absence of health risks, their main concern is to earn a decent income, which is difficult when organic produce is sold at the same price as conventional. There is currently no policy to promote organic farming, either at the level of government support or by NGOs, and therefore some trained farmers do not see the viability of adopting organic production systems.

### Farmers trained in IPM

Amongst the 315 farmers surveyed, 254 had been trained only in IPM methods. Of these, 75% confirmed that they do apply IPM methods in their fields. The majority (62%) of IPM trained farmers are men. A considerable proportion of IPM trained farmers have not received formal education. 54% cultivate areas less than one hectare, but a small minority are so-called 'large' farmers, cropping on areas of two to four hectares. IPM trained farmers described five main pests: caterpillars; nematodes; aphids; whitefly and grasshoppers. The main control method for these is through application of crop protection products, either botanical extracts, biopesticides or synthetic pesticides.

IPM implementation focuses on good agricultural practice and a rational use of synthetic pesticides. Crop protection under IPM can be with either natural or synthetic products. The majority (88%) of IPM trained farmers uses both synthetic pesti-

**Table 2. Pest control products used by IPM farmers**

Natural products		
Name	Frequency (%)	
Neem extract	35	
Biobit ( <i>Bt</i> )	29	
<i>Calotropis procera</i> extract	5	
<i>Jatropha curca</i> extract	1	
Pepper extract	1	
Synthetic chemicals		
Product	Active ingredients	Frequency (%)
Metaphos	Methamidophos	8
Dimethoate	Dimethoate	5
Lannate	Methomyl	3
Conquest	Triazafos, acetamiprid, cypermethrin	2
Deltamethrine	Deltamethrin	2
Furadan	Carbofuran	2
Keltan	Dicofol	1
Maneb	Maneb	1
Cypercal	Cypermethrin + methamidophos	1
Malathion	Malathion	1
Tamaron	Methamidophos	1
Kart	Cartap	1

cides and natural products while 12% use only synthetic pesticides. This latter group say that they practice IPM by applying good agriculture practices learnt through Farmer Field Schools. Neem seed extract and Biobit are the most utilised botanical and biological methods, as with organic farming practice. Other botanical products are used in relation to their availability. In terms of synthetic pesticide use, a total of

12 pesticide products were recorded in this survey (Table 2). It should be noted that the frequency of pesticide application is related to pest incidence and persistence.

Other problems encountered in cropping practice are: poor efficacy of biological products; cost of inputs; and lack of organic matter for composting. The range of natural pest control products available to IPM farmers is small compared to conventional pesticides. Neem seed extract and Biobit are only effective for certain types of pests and, according to farmers interviewed, this causes farmers to perceive a low efficacy of botanical and biological methods. In terms of cost, although IPM trained farmers recognise that they use less agrochemical inputs than conventional growers, some farmers felt that the cost of synthetic inputs was a major factor in their production costs. All farmers interviewed use synthetic fertilisers and pesticides to some extent in order to reduce losses and increase yields.

### Marketing IPM produce

IPM trained farmers grow a range of crops, the most common being hibiscus, turnip, cabbage, nana, tomato and carrot. Potato and aubergine also give good yields. They supply to four main sales points, Keur Abdou Ndoye being the most important, followed by farmgate sales to traders. Other outlets are Dakar's Thiaroye market and



Organic market stall in Thiès

Photo: PAN Africa

Notto sales point in Niayes. As for organic farmers, lack of specific markets for IPM produce, transport costs and losses from unsold produce are major problems. Farmers feel that their IPM produce should be sold at a slightly higher price than conventional as they invest more time in production and the production system respects the environment and poses less of a health risk to consumers. Although IPM production is carried out in 30 different localities, only three principal market outlets are utilised. Over 60% of farmers use carts to take produce to sales points, while 31% use public-transport. Transport costs are not considered when it comes to sales price. Market saturation was also reported, partly due to lack of adequate markets, but also because farmers in the same zone do not work together to organise production systems and often grow the same crops. As for organic farmers, lack of recognition of the healthier produce from IPM was cited as a constraint to better marketing.

For the 25% of IPM trained farmers who do not apply the IPM techniques they learnt, inefficacy of natural products was the main obstacle to IPM implementation and lack of control options for pests not controlled by neem seed extract or Biobit. Lack of water is another constraint and several farmers also complained about the lack of follow-up after training. Farmer field schools in IPM only last around four months and after that there is no further interaction with either field staff or the training organisations. They prefer to use synthetic pesticides that are easily available rather than what they consider wasting time in preparing botanical extracts. They also like the fact that synthetic pesticides are formulated locally in small volume packages affordable by farmers, unlike natural products such as Nimix which is expensive. Another reason some gave for non-implementation of IPM was that the farmer who had been trained was not the person who actually worked in the field. Field work is often done by foreign workers without any form of training. Another constraint was the workload of IPM, particularly agroecosystem analysis to check for pests and diseases, as well as poor soil fertility.

### Addressing the challenges

Whether trained in organic or IPM approaches, farmers face serious problems putting their training into practice. Several of these are common to both organic and IPM farmers but there are also specific problems for each production system. Beyond production there are serious constraints in marketing common to both production systems: lack of specific markets for healthy produce; lack of recognition by consumers; competition with conventional produce; transport costs to sales points; intermediaries in supply chains; lack of produce preservation systems. Despite these problems, the large majority of trained farmers do apply their training.

## Stockholm Convention lists nine new chemicals

For the first time, new chemicals have been added to the original 12 Persistent Organic Pollutants to be phased out under the Stockholm Convention. 800 delegates representing 149 countries, intergovernmental organisations and observers including NGOs from around the PAN network, met in Geneva in May 2009 for the 4th Conference of the Parties to the Convention. It was always going to be a difficult meeting. For those governments who see no need for further restrictions, adding new chemicals can be seen as a precedent which paves the way for many more to be added in the future. Right into the early morning of the last day of the meeting, there was still heated debate. Nine chemicals were added giving a new total of 21. Five of the new POPs are no longer in production, and so are not controversial. But for the remaining four, including lindane (the elimination of which is a goal for PAN internationally), although they were added to the list, exemptions have been included.

In the case of lindane, the exemption (which will last for five years) is for treating headlice and scabies. All agricultural uses will be phased out, and production will cease, but as Karl Tupper of PAN North America and one of the observers at the meeting says 'While we are pleased that production of lindane and its use in agriculture will now end, it's very disappointing that a loophole has been added allowing parties to use existing stocks in treatments for lice and scabies. This pharmaceutical exemption in essence allows the disposal of existing stocks by dumping them on children's heads.' Mike Williams, Chief of the Yupit Nation in Alaska and part of one of the Arctic Indigenous groups at the meeting, said 'It is wrong to allow the use of lindane on our children. We know that there are healthy, safe alternatives.' Discussions between African NGOs and country delegates helped prevent an exemption for one agricultural use, seed treatment, being included in the final decision.

The other eight chemicals added to the Stockholm Convention's list of POPs targeted for elimination are:

To Annex A – for elimination: two byproducts of lindane manufacture – alpha hexachlorocyclohexane and beta hexachlorocyclohexane; chlordecone, an agricultural pesticide; three types of flame retardants: hexabromodiphenyl ether and heptabromodiphenyl ether, tetrabromodiphenyl ether and pentabromodiphenyl ether, and hexabromobiphenyl; pentachlorobenzene (used in PCB products, in dye production, as a fungicide and as a flame retardant); to Annex B - for restriction: PFOS (perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride), with a number of exempted uses.

Also at the meeting, World Health Organisation (WHO) Director of Public Health and the Environment Maria Neira announced a 'rejuvenated international effort' to roll back both malaria and the use of DDT. This is the commitment that PAN and its allies have been waiting for, to counteract the 2006 WHO announcement that DDT had a 'clean bill of health' for use in indoor residual spraying for malarial mosquitoes. At the meeting, a new initiative between the WHO and the UN Environment Programme (UNEP) supported by the Global Environment Facility was announced which will support sustainable alternatives to DDT in combating malaria through regional programmes encompassing 40 countries. This will include significant investment in Integrated Vector Management techniques, which have proved successful in countries such as Mexico [PN76, p15]. PAN welcomes this new focus on alternatives to DDT. The reality is that DDT use is growing each year, in spite of the aim of the Stockholm Convention to eliminate it, so real effort and willingness by international organisations to make available the known alternatives, and seek new solutions, is essential and timely. (LC)

The mapping exercise and survey has enabled PAN Africa and its partners to identify in detail the villages and farmer associations where organic or IPM production takes place and to identify problems linked with each production system and with marketing. To overcome these problems it is important to:

- protect and encourage smallholders engaged in safe and sustainable food production
- inform Senegalese consumers about IPM and organic food
- guarantee consumers product quality through the establishment of a labelling scheme

- create market outlets for IPM and organic produce at local level and promote these
- PAN Africa is working to

- define terms for a collaborative network of organic and IPM farmers
- define cropping guidance protocols for organic and IPM production and support their implementation
- establish a quality control system for fruit and vegetables produced under organic and IPM methods.

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