

How well do we understand the agro chemicals that we use?

Brief on Agriculture in Uganda

Agriculture is the backbone of the Ugandan economy and contributes roughly 22.5% to the country's Gross Domestic Product (GDP), more than 70% to the working population, accounts for approximately 48% of the country's exports and provides a large proportion of the raw materials industries. The country was divided into ten agricultural production zones according to the 2004 zoning strategy by Ministry of Agriculture Animal Industry and Fisheries (MAAIF).

A five-year Agricultural Sector Development Strategy and Investment Plan (DSIP) 2010/11 – 2014/15 identified four main challenges of the agricultural sector in Uganda: low production and productivity; low value addition to agricultural produce and limited market access; weak implementation of agricultural laws and policies; and weak public agricultural institutions. Increased commercialisation of agriculture (in order to shift from subsistence) can only yield positive results when the aforementioned constraints are averted. This commercialisation is cross cutting irrespective of the farmers' acreage; small holder vegetable farmers sell at local markets and roadside stalls on a daily basis to sell their produce, not to mention the growing number of large scale farmers. This has compelled farmers to intensify use of inputs like fertilisers and pesticides in order to leverage their productivity on the farm.

Brief on what pesticides are

Pesticides are widely used in agricultural production to protect crops and animals from pests (including insects, mites, birds, ticks, nematodes, weeds, fungus and other organisms that cause losses in agricultural enterprises) in an effort to reduce or eliminate yield losses and maintain high product quality. Pesticides are also used in public health for controlling disease vectors such as mosquitoes and in households to control bedbugs, rats, and cockroaches.

Some pesticides are prepared locally by farmers (natural pesticides e.g neem extract, wood ash, urine) while others manufactured in industries through advanced procedures (synthetic or artificial pesticides e.g glyphosate, cypermethrin).

Pesticides can be grouped according to a number of ways including their toxicity, what pest they manage and how they manage it. According to toxicity (capacity to cause harm to human) we have class Ia (most toxic), Ib, II, III and IV/U (least toxic). According to what they manage, we can have insecticides, Acaricides, fungicides, herbicides etc According to how they manage, we can have contact, systemic, selective, non selective/broad spectrum, pre emergent, post emergent pesticides. Colour codes in form of a coloured triangle or a coloured strip are also included on pesticide labels to indicate the toxicity and they range from purple to red, yellow/orange, blue to green respectively as per the toxicity classes.

It is important to understand that every manufacturer/distributor has brand/trade names for their products/pesticides however in addition to there is always the name of the active ingredient (poisonous component of the pesticide) on every genuine pesticide label. For example a herbicide like glyphosate may have different trade names like Weedmaster, Sweep, Roundup.

It is crucial to be very cautious when handling pesticides by ensuring that we buy from reputable agro chemical shops, we get enough guidance on the instructions of use, safely store them in lockable areas away from children, animals and food/feedstuffs, mix the recommended dose, spray using well functioning and non-leaking spray pumps and properly protect ourselves with a minimum of long sleeved clothes, gumboots, and hand gloves, and responsible disposal of empty pesticide containers.

Given our tropical climate, dressing up in a full personal protection kit (including covering the face) like an astronaut makes the person spraying very uncomfortable; therefore the first line of protection is use of a non-dripping spray pump and observing the wind direction. We also need to avoid spraying during hot time of the day as this makes the protection clothes even more discomforting and also a sweaty skin is prone to quickly absorb any accidental spill of pesticide.

Pesticides picture across Africa

Each year around 30% of the US\$900 million pesticides marketed in developing countries do not meet internationally accepted quality standards. They are posing a serious threat to human health and the environment, according to a joint statement from the UN Food and Agriculture Organization (FAO) and the World Health Organization (WHO). The FAO and WHO statement said that the problem of poor quality pesticides is particularly widespread in sub-Saharan Africa, where quality control is weak. Pest management commentators in West, East and Southern Africa agree that one major consequence is the rapid decline in quality of pesticides and their effective regulation and control at retail level, following privatisation. Pesticides are increasingly sold through informal networks of small distributors and hawkers, many of whom have no technical knowledge of pesticide hazards or safe handling. Products are usually imported in bulk and repackaged into all kinds of containers for local retail but these rarely carry adequate or any labelling. Restricted and banned pesticides can still be purchased, suggesting that illicit trade, often across national borders, is a major problem. In Uganda, for example, farmers in 1999 were still buying dieldrin from small traders despite this active ingredient being severely restricted for several years.

Blatant adulteration of products approved for grain storage by unauthorised dealers is a key problem in Tanzania and has become a major issue since liberalisation of input supplies. A survey of farmers' maize stores in Benin asked smallholders about their current pest management practices, compared with five years before. The percentage of farmers using approved products for grain treatment had dropped from 13% to 0% in one province, while those applying field pesticides (i.e. products not approved for storage use) had increased from 24% to 53%. Misuse of organophosphates and fumigants carries the greatest risks to human and livestock health. There are anecdotal reports of acute poisonings in Ghana when highly toxic phosphine has been applied to grain or used as rat poison. The experience of farmers and researchers in northern Ghana is that organic farming approaches can be successful and are often more productive and cost-effective than reliance on chemical pesticides.

Ghana was one of the first countries on the continent to sign the Rotterdam Convention on Prior Informed Consent for importation of pesticides and the Ghanaian Environmental Protection Agency has banned nine problem pesticides in WHO Classes Ia, Ib and II. Zimbabwe has set up a

coloured triangle code for pesticide labels to indicate hazard levels and recommended safety precautions.

An overview of pesticide practices in Uganda

Most smallholder farmers supply the local markets with fresh vegetables on a daily basis and production is intensive with crop duration of less than two months for some vegetables. There is high pest infestation and disease infection on the vegetables and other crops like cotton and so is the spraying with pesticides.

There are several pesticide safety concerns in the intensive cut rose industry in greenhouses, private fumigators and also the intensive use of pesticides by small scale farmers. The smallholders lack adequate knowledge on safe pesticide use. For example most farmers don't use personal protective clothing when spraying, others unblock the nozzle of the knapsack sprayer by blowing in with their mouth, others store pesticides in their bedrooms and disposal of empty pesticide containers in water ways is a wide spread practice. Also most tomato farmers often spray the fresh tomatoes towards or even after harvesting before taking them to the market, thus it is not uncommon to find tomatoes with pesticide residues on sale. It has also been noted that due to farmers' ignorance of the pesticides naming, they end up buying one pesticide in duplicity under different trade names (they switch brand names instead of active ingredients); this has resulted into pests on the farm acclimatising to the same or related chemicals and hence forth developing resistance thus leaving farmers frustrated after investing their hard earned money in a crop enterprise.

Commercial flower farms give their employees, especially the spray team basic training on pesticide safety but due high cases of labour turn over, it is so demanding to organise training for every new employee. There are also reported cases of spray men going blind in large estate tea farms.

Pesticide legislation in Uganda

FAO statistics show that the import value ('000'\$) of pesticides in Uganda has been on an increase: 13,894 (year 2005), 20,511 (year 2007) and 32,575.5 (year 2010). On top of that it is estimated that there is big percentage of pesticides smuggled into the country over non-secured borders.

The development of quality assurance standards in Uganda is governed by three international conventions, namely: the International Plant Protection Convention (IPPC) for plant disease and health standards; Codex Alimentarius Commission (CODEX) for food safety standards; and the International Office of Epizootics (IOE) for standards for animal health and animal products. However, a considerable number of laws, rules and legislations are now obsolete and need to be revised in the light of current conditions. Across the board, the review process is on-going but very slow. This is partly because the implementation of much of the legislation lies in the hands of several ministries or authorities with no proper co-ordination (Agriculture sector DSIP 2010/11-2014/15).

The pesticide legislation is primarily based on the Control of Agricultural Chemicals Act of 1989 (*with latest version revised in 2006*) that established the Agricultural Chemicals Board (ACB) in the

Department of Crop Protection of the Ministry of Agriculture Animal Industry and Fisheries (MAAIF). The board is responsible for the registration of agricultural chemicals of which pesticides are an important part. The registration criteria in Uganda follow the same lines as elsewhere, for example to comply with the Plant Protection Product Directive of EU, US Environmental agency, FAO code of conduct and international conventions on pesticide exports and restrictions.

The National Environment Management Authority (NEMA) prepares environmental guidelines for management of hazardous chemicals and it also takes initiative to conduct Environmental Impact Assessments of regularly used practices in order to mitigate adverse environmental impact. NEMA is a member on the Agricultural Chemicals Board and provides guidelines on the effect of residues on human health and the environment, disposal of expired pesticides and restricting or banning extremely toxic and hazardous pesticides.

Wrapping up

Whilst more effective control and regulatory mechanisms are obviously necessary, including stricter penalties for non-compliance, these mechanisms require adequate funding for revamping the extension service system and for pragmatic implementation of redundant stipulations in the Agricultural Chemical Control Act. Of equal importance is the need to raise awareness amongst the general public, key stakeholders and decision makers, and to encourage the promotion of safer and more sustainable alternatives to the dependency on chemical control of pests.



Aggrey Atuhaire

-Research fellow at 'The Agency'

-Agronomist on PHE Uganda Project