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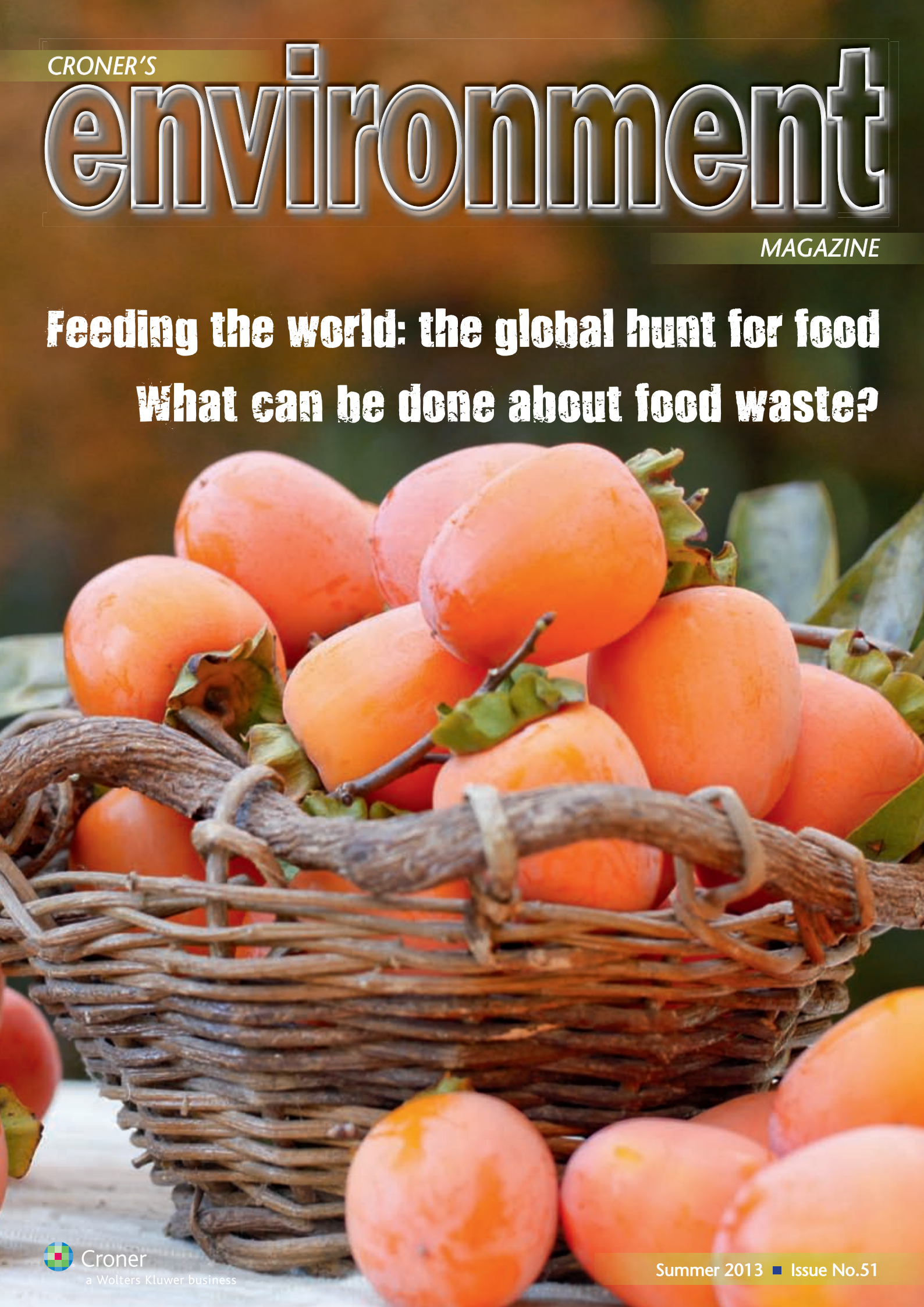
MAGAZINE

Feeding the world: the global hunt for food

What can be done about food waste?



Croner
a Wolters Kluwer business

Summer 2013 ■ Issue No.51

Feeding the 9 billion: the global hunt for food

Mankind's evolutionary success is built largely on winning the battle for food. Are modern humans in danger of losing the war? asks ***Jon Herbert***.

Food is one of life's staples. Nothing defines *Homo sapiens's* relationship with the environment more definitively than the endless human hunt for sustenance.

Originally, the balance was a natural one. Mankind's limited number as a species made no great impact on the planet. Even the agricultural revolution was quite easily accommodated within the natural environment.

Now there are many more of us and we demand far more. Technology has largely banished famine, but it has also allowed the affluent world to indulge in food fads and fancies. We expect food to be available as we want it, where we want it and when we want it.

As a result, we have turned the world into one highly organised food production machine. Far from being meek, we are now the overlord species. Cattle country has replaced forests. Wide prairies are ploughed and harvested on an industrial scale. Irrigation makes the desert bloom. Fish are seen as a perpetual harvest.

Yet the machine, and the delicate balance that makes it work, are beginning to show signs of stress. The environment and climate we now depend upon so closely no longer seem to be as benign as before.

Wild weather and an increasing number of mouths to feed is turning nutrition into a commodity suffering from limited supplies and erratic prices. Scarcity is making a comeback. Could the world as a giant food factory possibly fail? How finely tuned is the balance between want and plenty? Can policy-makers and technologists offer a man-made solution? Is it possible to build new resilience into the system with high-selected plant strains and genetically modified crops? And what would be the sustainable social implications?

Of mice and geology

There are several aspects to this unfolding conundrum. The first is that we have made ourselves completely dependent on a stable planet to feed us. It is easy to forget that natural events common on a geological timescale, such as tsunamis, volcanic eruptions, or even meteors and asteroids, can destroy our carefully laid plans in seconds.

In our rush for cheap food, it is also very easy to overlook the fact that an efficient food strategy based on carbon-creating global shipping and air links might also be damaging the very environment on which we have come to depend for sustenance.

This is by no means a clear-cut question. What we want to eat can be more harmful than how we produce it. Calculations show that freighting foods around the world often has a far lower carbon footprint than relying on artificial heating to ripen out-of-season fruit and veg locally. The answer might be not to "want" specific foods all year round. But this now has serious employment implications.

Finally, if change is inevitable as a result of either natural or man-made causes, can even more technology, biotechnology, or discovering how to adapt to a less kindly environment save us? Or is the correct answer simply to learn to do with less and suffer when there is no alternative?

In the second decade of the 21st century, part of the problem is one of ignorance. We are only now starting to understand the complex interactions between rising temperatures, unpredictable wet, cold and dry weather,

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excessive waste, a dependence on long food supply chains and other seemingly unrelated parameters that actually interact closely.

Rights and responsibilities

Acres of white stretching to the horizon in southern Spain at first glance might seem to be snow. In fact, they are mile after mile of polythene tubing used to grow export tomatoes. This graphic snapshot of modern horticulture begins to illustrate man's ingenuity in manipulating arid land to yield lush crops.

The result may be far more good than bad. A critical factor is that it is now estimated that some 1.5 million African workers depend for their living on putting food into northern hemisphere mouths. This may be efficient but is it sustainable? The answer is not necessarily "no". In fact, it may be more sustainable than the alternatives. But the vulnerability of long-distance food chains cannot be underestimated.

When Iceland's Eyjafjallajökull volcano erupted three years ago, aviation was paralysed for days over northern Europe. Although the skies were later declared safe for delicate jet engines that are easily damaged by certain sizes of fine dust particles, this could just be a portent.

Although it failed to blow in 2010, the larger Katla volcano has historically vented shortly after Eyjafjallajökull, throwing ash and dust high into the atmosphere not for days but for several years. This is a cyclical geological event that last took place before the Wright brothers invented powered flight at Kitty Hawk in 1903. Could we cope today with not being able to fly thousands of tonnes of fresh produce into Britain daily for months on end?

Global warming is also slowly threatening the food production machine we have crafted directly. Floods can unexpectedly decimate the southern Russian grain harvest, as happened in 2012. Freak storms did the same to the American Mid-West. Grain prices soared.

In the UK, a 2012 spring drought in East Anglia followed by heavy rain a year later was not conducive to good reliable crop yields. Unexpectedly cold winters and waterlogged fields ruin harvests and depress vital farm output.

Waste not

Perhaps we can begin by not piling more necessity on top of uncertainty. Waste could be a good starting point.

The Institute of Mechanical Engineering (IMechE) estimated recently that up to 50% of the food the world produces is probably squandered. Poor storage is a major contributor in the developing world. Whims and fine regulation distort developed world markets. Food is often fashion. An aversion to oddly shaped vegetables, plus a general misunderstanding over the meaning of "best before" labels, result in far too much food going to landfill where it decomposes to produce the greenhouse gas methane.

The report *Global Food: Waste Not, Want Not* suggests that between 30% and 50% of the four billion tonnes of food produced globally each year never finds its way to the plate. In the worst case scenario this could be two billion tonnes wasted or lost.

Although the basis of the figures has been questioned and is said to draw on previous information, particularly from the UN Food and Agriculture Organization, if true, waste on this level could be used to feed the extra three billion people expected to swell the Earth's human population in decades to come.

It also points to an extreme misuse of land, energy and water. Some 550 billion cubic metres of water is now estimated to be wasted in growing these crops. The figure could rise to between 10 and 13 trillion cubic metres annually by 2050. That is 2.5 to 3.5 times greater than the total volume of fresh water mankind uses today. Dangerous worldwide water shortages could result, says the IMechE.

Cheapness and low-price promotional offers can also cause foods to be undervalued. Too many bananas and carrots find their way into the shopping trolley and then the wheelie-bin.

The net upshot is 3.6 million tonnes of uneaten — often unopened — UK food hauled off to landfill annually. Innovations in food delivery, or our attitude to a never-ending supply of plentiful, affordable food, are urgently needed.

And then there are governance issues. Can we be assured that a beef product is totally free from camel or penguin meat? We take an awful lot on trust when we open a packet and commit food to our mouths.

Beneath the waves

If food policy above sea-level is confusing, it is fast being revealed as a catastrophe in the oceans.

Fishing boats were vulnerable targets during World War II. As a result, the North Sea and other coastal waters were exploited less. When commercial fishing resumed post-1945, fish stocks were booming after half a decade of relative sub-sea peace.

Today, the bottom of our shallow seas appears to have been at war. Heavy beam trawling has progressively scoured the sea-bed into a flat, lifeless plateau. Natural carpets of weed, sponges, invertebrate life and fish shoals are all but gone. Sensitive food chains have been destroyed. Destruction on this scale would not be tolerated if it was easily seen. The waves hide a nightmare.

The cause is years of gross overfishing. The solution is largely political. Although they account for more than 95% of planet Earth's habitable space, the oceans are in desperate need of being nurtured rather than plundered. We have made them part of the food machine.

Only in February 2013 did EU policy-makers finally agree to allow fish stocks to recover above the level known as the maximum sustainable yield. This is the point where they are no longer considered to be overfished. On more than 70 occasions when the science has called for fishing moratoriums, politicians failed to act. Since the 1980s, landing quotas have regularly been a third higher than the sustainable recommendation.

After years of delay, the much-derided European Common Fisheries Policy has now been changed fundamentally, much to the chagrin of several nations that have seen fish as pawns to be bargained and bartered with politically.

On a strategy-changing vote of 15 to 9, the practice of throwing back under-sized fish has now ended. So has the setting of excessive quotas. The new policy goes further. Vessels that cheat will now lose their EU subsidies. Small-scale fishermen are to be given preference as they kill fewer fish. Changes in the amount of time boats are allowed to be at sea mean that trawlers must work closer to home ports.

In addition, 15,000 square miles of English waters have been designated as marine conservation zones in 31 well-defined protected blocks. While cod stocks are recovering, the focus has moved on to the fate of mackerel in far northern Nordic Atlantic waters, where the problems are again political.

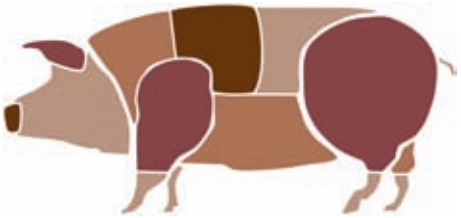
Modified ambitions

What other weapons are in the food armoury as the world's population peaks at around nine billion before falling back again later in the century?

One answer might be genetically modified (GM) crops. This is a controversial fulcrum that could well decide whether we are the planet's guardians or destroyers. In the worst scenario, it is argued we could be the authors of a pathogen — an infectious agent that causes disease or illness to its host.

GM crops have specific DNA changes introduced by genetic engineering techniques that are much more precise and faster than traditional selective breeding methods. Commercial sales began in 1994. Typical target benefits are quicker growth, resistance to viruses and diseases, additional nutrients and economically useful characteristics such as delayed ripening.

Opponents object on safety grounds, because they have ecological concerns and because they do not approve of the restricting access by placing intellectual property restraints on food sources. To date, GM has included plants but not animals, although a genetically modified salmon was close to obtaining approval in the USA (by the US Food and Drug Administration) at the close of 2012.



Complex field trials and marketing approval must be in place before seeds can be mass marketed. Farmers in turn introduce their new crops to market as commodities rather than defined, named products. Some 25 GM crops can now be grown commercially.

Great debate continues as to whether GM crops and produce could be harmful, should be labelled, need close government regulation, may affect wild strains, have a beneficial or adverse economic effect on farmers — particularly in the developing world — or are in fact a key ingredient in feeding a hungry, growing world population.

Organisations such as GM Freeze are concerned at the speed at which genetic engineering is being introduced and believe we must all stop and think about the potentially huge implications of this new technology and its safety.

Could carefully modified grapes eventually ripen in West Country vineyards while rice is harvested over the plains of East Anglia? Despite other GM arguments, there could be a major new problem. It might be a tall order to invent a crop that could withstand torrential rain one year and prolonged drought the next. Science does not do magic.

So is it a case of eat, drink and be merry because tomorrow we die? Or can wise policy-makers, scientists, technologists, millions of responsible consumers, or all four working together intelligently, guarantee sustainable food supplies that will always hold at bay one of man's oldest mortal enemies — starvation? ■

Jon Herbert has been a Director of ISY International. He is a former communications manager and investment advisor. He has written on environmental issues for many years.