**GM crops - Frankenstein Food ?**

**Are "genetically modified" crops really dangerous? Or are they essential for feeding the world's growing population?**

*"Genetically modified* ***crops****" are controversial. In Europe, militant "greens" and angry small-farmers have attacked and destroyed fields of experimental "GM"* ***crops****, seeing them both as symbols of  multinational agribusiness, and as a* ***threat*** *to the world's natural environment.
    Is there any sound scientific evidence to back up the protestors' fears, or are the protests largely motivated by ignorance? Is the anti-GM movement progressive, or is it a form of fundamentalism, caused by fear of the unknown ? Different people have different views on the matter, but history shows that* ***quantum*** *developments in science or technology have always provoked a backlash motivated by fear or misunderstanding.*

     When industrial machinery began to appear in British factories over 200 years ago, ***factory****-owners* were wildly enthusiastic; so were many workers. But there were other people who took a different view. Groups known as the **Luddites**, opposed to the mechanisation of factories, sprang up across Britain, adopting commando tactics to break up new machinery in factories -  *claiming* that it would destroy jobs and change people's lives for the worse.

    When the first steam trains appeared in the 1830's, they provoked violent reactions too; opponents claimed that  they were dangerous, noisy and dirty, would destroy cities by fire, and kill people through speed. Some landowners resolutely refused to allow lines to be built over their land. Fifty years later, the arrival of the motor car was met with a similar mixed response - opponents arguing that "horseless carriages" were far too dangerous to be allowed on Britain's roads.  *For a while*, the opponents almost won the battle, and until 1896, cars on Britain's roads had to be preceded by a man walking with a red flag.

    Indeed, the history of scientific and technical progress is full of examples of resistance to progress - in a paradoxical illustration of Newton's third law of motion\*.

    This being the case, the vigorous reaction in Britain and several other countries against the introduction of genetically modified ***crops*** is not surprising; indeed, it is probably inevitable. Since the catastrophe of "Mad Cow Disease", - and in spite of the enormous benefits brought about by modern agricultural practice - agribusiness and scientific modern farming methods are seriously contested *in many quarters.*

    In Britain, the argument over GM crops has become the most contested scientific dispute since the arrival of the atom bomb *.* In 1998 a  public opinion poll showed that 77% of British people did not want genetically-modified crops to be grown in Britain - though only 58% were opposed genetic modification in principle.  And in spite of historic parallels that tend to suggest that resistance to change is rarely effective in the long run, the  *controversy* over genetically modified crops is perhaps more critical than most.

    In spite of public apprehension, UK governments have continued to support research into GM crops, and today hundreds of hectares of genetically engineered plants are  growing in Britain, mostly in agricultural research centres, universities and plant laboratories. Here and there, fields of genetically modified crops have been planted  and to the passer-by, they  *look* no different from other fields.

    In many ways, GM crops are not really very different from others. Scientists have been selecting and "improving" crops for hundreds of years, often by the slow and dubious method of "trial and error". Most of the crops and fruit growing in today's fields are very different from the varieties grown two centuries ago, and far more productive; far from being "natural" plants, they are new strains that have been developed by genetic selection of  the best. "Genetic Modification" just takes the process one stage further, allowing agricultural scientists to produce new varieties with specific required qualities.
    One of the main objectives in altering the genes of certain plants is to make them resistant to ***disease*** and to pests, and thus reduce the need for pesticides. Another is to make them resistant to particular ***weed***-killers, so that farmers can spray fields knowing that the spray will kill almost all plants except the *selected*  crop that they are growing. Other genetic modifications are aimed at producing plants that need less fertilizer or are more resistant to ***drought***, and thus need  less watering. Most developments in these directions are strongly positive in environmental terms.
     They are also positive in human terms, and development of drought-resistant and disease-resistant crops will have major implications for developing countries, where ***famine*** is a constant risk. It is therefore not surprising that developing nations with large populations to feed, such as China and India, are keen supporters of  genetic research; unlike Europe and North America, with their agricultural surpluses, many poorer nations already cannot produce enough food to feed their populations.
    In other developments, laboratories are genetically incorporating vaccines - including hepatitis B and ***rabies*** - into certain plants. Plant-based vaccines are potentially far cheaper to produce and easier to store than their chemically-manufactured equivalents.

    Rejecting these arguments, opponents of genetic modification point to the enormous risks that could be involved. While fears of "mad corn disease" are *as yet* purely hypothetical, other risks seem more realistic. Greatest of these is perhaps the fear that genetically modified crops can naturally interact with other plants, producing super-resistant weeds that could create chaos in agriculture. According to the Government's own advisory ***body* English Nature**, genetic crops "pose a ***threat*** to all wildlife". In a recent paper, English Nature scientists *stressed* that the introduction of genetically modified plants might dramatically reduce plant diversity in Britain, destroying fragile ecosystems and leading to the rapid disappearance of certain species of plantlife, insects and birds.
    Cynics might reply that species of plant life, insects and birds have been disappearing for years already.

    In the short term, the arguments seems unlikely to go away. American farmers are already mass producing genetically modified crops, and so far there has been no reported disaster. That does not mean that disasters are impossible. In ten or twenty years' time, we may have a better idea of how likely, or unlikely they are; in the long run the argument about genetic modification will sort itself out one way or another. Until then, ***it is up to each individual*** to weigh up the pros and the cons and decide if the risks outweigh the advantages or not.

**WORDS
crop:** *food plant -***threat:** *risk -***quantum:** *major, game-changing -* **factory:** *industrial production unit -* **disease:** *illness, sickness -* **pest:** *insect, animal or micro organism that attacks plants -* **weed:** *plant that is not wanted -* **drought:** *exceptional dryness -* **prevent:** *stop -* **famine:** *when people do not have enough to eat -* **rabies:** *a fatal disease transmitted by foxes, etc. -* **body:** *committee -* **it is up to each individual :** *each person must*

*. Explain or rephrase the following expressions:*

* *Backlash*
* *A mixed response*
* *In spite of public apprehension*
* *Will have major implications...*
* *as yet*
* *the arguments seem unlikely to go away*
* *in the long run*
* *weigh up the pros and the cons*
* *outweigh*