

The Agriculture of British Hemp in the 1990s

In this major report prepared by pioneering hempsters Hemcore, Peter Messenger and Ian Low, outline how they persuaded the Home Office to let them grow hemp, and all the details of hemp cultivation.

Hemp made a commercial reappearance in Britain in 1993 after an absence of thirty two years. The Home Office and the Ministry of Agriculture allowed the relaxation of restrictions concerning the cultivation of *cannabis sativa* in February, 1993, albeit under strict licensing controls. They indicated their belief that hemp would be a minority crop and would not become a common feature of Britain's rural landscape. We hope to share the experience of hemp's re-introduction and ascertain that the plant could weave its way into the very fabric of future rural and economic life. In time, hemp could become an even bigger motif in the tapestry of patchwork England than the yellow flowers of oilseed rape or the blue flowers of flax.

In the mid 1980s, Peter Messenger realised that there was a discrepancy between the dictionary definition of hemp and the status of *cannabis* as an illegal drug and he began to discuss the possibilities of tree-free paper and hemp cultivation in the UK with a friend, Haricot Vert.

Having set up Ecologically Sound Papers (ESP), in October, 1989, he approached Europe's only commercial hemp paper mill, Cellulose de Levante in Spain. Although they couldn't foresee a market for non-cigarette grades of paper, they agreed to supply initial quantities of pulp and successful paper-making trials were commissioned with James Rivers Fine Papers of Scotland. At this time, hemp fibre was imported by one UK mill to produce cigarette paper tissue and sold as horse bedding by one company in Gloucestershire. France was the source for both raw materials. In the Spring of 1992, Messenger established Hemp UK and THC (The Hemp Centre, which overlooks the dreaming spires of Oxford) in order to collate and to co-ordinate agricultural and research information.

Ian Low, Managing Director of Harlow Agricultural Merchants (HAM) in Hertfordshire, became interested in the possibilities of growing hemp after meeting a natural fibres consultant in 1991. Then HAM started selling the French hemp horse bedding from its shop in Little Hallingbury and it quickly became popular with customers who were persuaded to switch from using wood shavings, chiefly because of hemp's biodegradability. This product alerted Ian Low to the fact that the French were growing hemp with impunity and so HAM got in touch with the Ministry of Agriculture and began to research the possibility of growing hemp in this country.

HAM quickly realised that hemp was prohibited - because it's *cannabis sativa* - but felt that they had learned enough about the plant to conduct some initial trials in 1992 and applied to the Home Office for a license. The land on which HAM grow experimental crops is remote from public access and they had little trouble obtaining a license to grow up to 40 ten square yard plots of different hemp varieties. The FNPC in Le Mans organise several aspects of seed research, regulation and supply and have developed a dozen seed varieties, from Italian, Russian and German stocks, which satisfy EC regulations by yielding plants with a THC content of less than 0.3%. Visits from representatives of Hemp UK and HAM in 1992 paved the way for a vital seed source that has been denied to British farmers for decades.

Home Office officials monitored the THC levels in the various strains grown experimentally by taking samples from each plot and sending them for forensic analysis at the grower's expense. One variety of *cannabis* that HAM grew actually exceeded the statutory maximum THC level of 0.3 per cent and that plot had to be cut down and burnt in the presence of a local policeman.

The trials went well so well in 1992 that the following year HAM set up Hemcore, a consortium of hemp growers which would supply raw hemp fibre to industry, and decided to go ahead and plant a commercial crop. In the Autumn of 1992, Hemcore approached the Home Office for a license to grow 1,500 acres of hemp in various sites around East Anglia. While the Home Office officials had been quite happy to allow a small experimental crop, they had not envisioned anyone wanting to grow a crop that was likely to yield several thousand tons of *cannabis* and were not convinced that the benefits of hemp cultivation to UK farming outweighed any foreseeable problems.

Reports were commissioned from the Agricultural Development and Advisory Service and from the Home Office Drugs Division. We have only ever had cordial and constructive

discussions and dealings with these bodies, among whom there has been much accord that hemp could again become a useful cellulose resource. Their deliberations took up most of the Winter of 1992-93 and during that time there were several meetings at which the possibility was discussed of taking action through the European Courts if British farmers were denied permission to grow 1,500 acres of hemp while French farmers were growing ten times that acreage and receiving EC subsidy payments on their crop. It was also pointed out to the authorities that other European countries, notably Germany, were becoming increasingly interested in the re-introduction of hemp.

However, it didn't come to that and Michael Jack of the Home Office announced an easing of the restrictions on 18 February, 1993, thus permitting farmers access to the EC subsidy of £200+ per acre that the hemp crop attracts. Hemcore, Hemp UK, plus a small number of farmers in sites around the UK were issued with licenses to fields of grow cannabis sativa. The Ministry of Agriculture was eventually supportive, in concept, because they saw hemp as the natural fibre crop that offers British farmers the most viable alternative to food crops, which were in over production. While British business has been slow and is ill equipped to deal with the opportunities presented by hemp and have scarcely invested in research, the number and scope of interested parties was encouraging to those who had already put their money where their mouths were.

A year prior to the first licenses to grow were issued, hemp projects began to attract media attention. First specialist magazines, then increasingly larger publications starting writing articles about hemp. That Summer, once the crop was growing, we were inundated by journalists. Not only domestic newspapers, radio and TV, but stations from around the world sent representatives. We accepted every media opportunity that arose during that first Summer to explain to the general public that the kind of cannabis we were growing isn't the kind that gets you high when you smoke it and to discourage them from interfering with UK cannabis crops. As a consequence, perhaps, the Home Office now acknowledge that there were almost no problems with abstractions.

On the whole, we have found the media interest in hemp to be disappointingly facile. More has happened in the field of hemp in the past five years than in any other area of the debate surrounding cannabis for the past 30 years, yet no serious documentary programmes on the subject have yet appeared on British television. Perhaps the likes of Channel 4 and the BBC 'Panorama' programme, both of which covered cannabis-related topics in 1995, are unable to see the wood for the trees!

Licenses

The application form (MD 29) for a Home Office hemp license doesn't mention cannabis and this is left for the applicant to fill in, along with details of seed source, purpose, possessions, preparations and supply. Drug Squad officers sweep efficiently into action, arranging a site visit to validate the grid references of locations that must be well away from roads and public rights of way. The licence relates to sections five and twelve of the 1971 Misuse of Drugs Act. The definition of cannabis is '... any plant of the genus cannabis or any part of such plant (by whatever name designated) except that it does not include cannabis resin or any of the following products after separation from the rest of the plant, namely: a) mature stalk of any such plant; b) fibre from any mature stalk of any such plant; c) seed of any such plant.'

Under the CE Common Agricultural Policy (No. 1308/70, as amended) a subsidy is payable on hemp. Payment of the subsidy supposedly ensures that there is an even balance between the volume of production within the Community and the amount that can be marketed. EC definitions allow for 'true hemp' (cannabis sativa), raw or processed but not spun; tow and waste of true hemp (including yarn and garnetted stock). 'Hemp straw' is defined as true hemp, raw or retted. 'Hemp fibres' means true hemp scutched, combed or otherwise processed, but not spun, and tow and waste of true hemp including pulped or garnetted rags or ropes. The aid is only allowable on crops which have been completely sown and harvested and on which normal cultivation work has been carried out. Hemp can also be grown on set aside land and farmers can claim the arable area payment, as long as the crop is not for food use.

In the UK, the Intervention Board acts as the agricultural police and Leaflet CD 37 explains the full rules and obligations of EC hemp cultivation. Detailed records have to be kept of seed, sowing, cultivation methods, yield, and contracts of sale. While the crop is growing, Home Office licensees are required to protect it, monitor its progress, and record agricultural details.

Cultivation

Hemp will grow on marginal land, but this prince of plants will reward growing on good quality, fertilised land with higher and more homogenous yields. Throughout the world, there is currently a shortage of hemp seeds for planting and seed breeding programmes. In the future it is fervently to be hoped that a more global consciousness will permit poorer developing nations, which could most benefit from such a valuable plant resource, to sow hemp on marginal land. At the same time, the necessary processing infrastructure should be provided.

Soil considerations should weigh on the minds of land stewards all year round. Preparation for Spring sowing should begin the preceding Autumn and tie in with the appropriate rotation programme. Deep soil working and dung application, at a rate of 15-20 tonnes per acre, is the basis for allowing nutrients to be chelated by micro organisms prior to sowing. Other nutrient replacements include worm compost, rock dust and traditional N (Nitrogen), P (Phosphorus) and K (Potassium) inputs, which should also be incorporated prior to sowing. Particular attention should be paid to seed bed preparation. Hemp is a small seed (1,000 kernel weight between 10-25 grams) and relishes fine, uncompacted soils with a balanced pH of no less than 5.

Some research has gone into seed rates, row spacing and depth as these factors directly affect plant density at harvest, height and stem thickness, in particular the proportions of outer baste 'line' fibre to woody inner hurd fibre. Sowing rates for fibres vary from 300 to 500 seeds per square metre, depending on soil and intended applications. 20 pounds of seed per acre (50kg per Ha) are sown at a depth of between 2 and 6cm, depending on timing, soil structure and potential water availability. Traditional row widths are 7cm to 15cm. Standard sowing machinery can be used, although work on small seed kits and more adjustable row coulters would improve drilling performance.

Hemp seed will germinate at low temperatures, although a soil temperature of 10 degrees centigrade is suggested for optimum early growth. Depending on annual climate and regional differences, sowing usually starts in the UK in early May. Crops planted earlier have a tendency to slow initial growth and are not likely to produce higher yields.

Growing

Hemp seeds germinate in three to seven days and a green sheen across the field signifies emergence; before this stage, the crop should be rolled or lightly harrowed to consolidate the surface and to kill weeds. By the initial cotyledon leaf stage and the showing of the first pairs of true leaves, the young plants will have a sufficient head start over any re-emerging weeds. From then on the hemp plant will excel in normal conditions. Given humus-rich soil, average UK rainfall and as much sun as we're likely to get, the farmer can anticipate growth of up to two inches per day.

Opposite leaf stems (petioles) quickly create a full ground cover and a canopy, which will lead to superb shading out of weeds and a clear soil for the next crop. Trials indicate that couche grass, sterile broom and old sod can be eliminated in one year and our experience is that hemp is the ideal break crop to bring fallow land and permanent pasture back into production. This has immediate relevance as regards the vast tracts of set aside land in the UK (some 350,000 acres).

Significantly, hemp requires no further additions of fertiliser, or pesticides. There is mounting public concern about agrochemical residues in the soil and hemp is a crop that can be grown without pesticides, so if you can get it into the rotation you can give the land a bit of a breather even if its only once in a ten-year cycle. Hemcore accept the use of use artificial fertilisers, but does include one or two organic farmers. There was also a separate organic growing project in 1993, which reported lower yields, but of a more uniform quality.

The Hemcore co-operative also includes a couple of growers who are growing hemp after hemp, year on year, which will enable us to see how hardy the crop remains without any artificial intervention. When a new crop is introduced, its quite common for it to grow perfectly well for a few years, with no pests or diseases, and then - as we've seen

with linseed and flax - no end of problems start to develop. The French and some of the Eastern Europeans have reported that they've grown hemp continuously on the same piece of land for more than twenty years, but that's not the way we want to see British farmers use hemp, which makes an ideal entry crop.

Over the four month growing period, the field of hemp grass will grow into a tree-free forest. At Hemcore, we made an awful lot of mistakes in our first year and learned a massive amount, but we did have a reasonable crop and we managed to harvest it without too many problems. There was a particularly rocky moment in July, when the police seemed close to ordering the whole crop to be uprooted because of local teenagers getting into the fields and cutting the tops of the plants. One was apprehended with a transit van containing plastic bin liners filled with hemp tops, having spent the whole night in one of our fields with a pair of shears. Over the past two years, however, this problem has abated and the onus is on the public to continue to have respect for hemp farming.

To the untrained eye and nose a cannabis hemp plant and inflorescence closely resemble a cannabis drug plant, but several safeguards will deter its abuse as hemp is re-introduced. Firstly, all cannabis leaves and flowers are included within the scope of the 1971 Misuse of Drugs Act. Secondly, hemp leaves are unpalatable to smoke and give insignificant psychoactive effects. Licensed hemp farmers will not be above the law and there is talk of genetic plant markers and portable THC testing kits. Budding entrepreneurs should note that male hemp plants can flower as early as the first weeks of June and will pollenate any other cannabis crop in the vicinity.

In all our dealings with the media, we have taken pains to emphasise that we are not for marijuana legalisation, nor are we against it. What we are doing is a separate issue. This is industrial hemp; it is not pot. Our farmers need a new crop and, as agriculturists, we believe that hemp is both economically viable and ecologically sound.

Harvest

During the Summer months, hemp will grow between five and fifteen feet. Male plants will shed their pollen in July. Maximum height is achieved upon female flowering, which starts in August. Harvesting usually occurs toward the end of August and continues through the first weeks of September. The plant will continue to grow, although leaves will die back, lignin content in baste fibres will rise and dying male plants can frustrate harvesting and lower overall batch quality.

There are two main methods of harvesting: binding and stooking; mowing-conditioning and baling, which is by far the most popular practise in Western Europe. The crop is cut and left to begin dew-retting and dry before baling. Round balers have proved to be the most efficient means of getting the crop out of the field. Machinery used has included standard mower-conditioners, modified rape swathers, and binders, with combine harvesters sometimes used to cut the seed-bearing heads prior to mowing of the stems.

The yield of crops in this country have reflected a steep learning curve. Already, farmers can plan with confidence to harvest five tonnes per acre of dry stem and up to half a tonne of seed, if equipped. Organic farmers report lower yields of three tonnes per acre. Baled hemp is currently valued at around £60 per tonne. Seed sells for upwards of £400 per tonne. Within Hemcore, seed yields have been low because we've found that they do not ripen until October in the British climate and, by that time, the quality of the fibres have deteriorated. We cut our crop early now, in mid-to-late August, and then leave it on the ground to ret.

Retting is the process of breaking down the lignin and pectin, the natural glues that hold a twelve foot tall plant upright. It's more of an art than a science and can take between one and six weeks. The crop is round-baled and brought to our factory in Essex, where it undergoes primary processing. There are several schools of thought on best practise, but water tank retting has traditionally produced the finest fibre. Dew retting may be followed by traditional hammer mill or other mechanical decorticating process, and stem steaming is also possible. Other new processes under consideration include the application of enzymes, steam explosion, steam retting, infield decortication, and ultrasound.

Peter Messenger and Ian Low, 1st April '96