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(*Cannabis sativa* L.)
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Robert C. Clarke

The sex identification of pre-floral hemp (*Cannabis sativa* L.) is problematic for taxonomists and plant breeders, because the distinguishing morphological characteristics of male and female plants do not appear before flowering. Employing the RAPD (Random Amplified Polymorphic DNA) technique with 15 random primers, we have

found that the genomes of female individuals bear female-associated polymorphic DNA fragments (870 bp and 1160 bp amplified by primer OPA-04; 1680 bp by primer OPF-05), which are absent in the genomes of male individuals amplified by the same primers. This technique makes it possible to determine the gender of dried herbarium specimens lacking flowers, and to select male or female seedlings for breeding parents and other uses.

KEYWORDS. PCR, RAPD, random primers, *Cannabis sativa*, female associated DNA polymorphisms, hemp genetics, China

Quality Aspects in Hemp Fibre Production–Influence of Cultivation, Harvesting and Retting

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Jörg Müssig
Reent Martens

For hemp cultivar Fedrina 74 we investigated the influence of different sowing dates in 1997 and 1998. The highest yields occurred with early sowing dates, at the middle of April. The pure fibre content of the plants of the last sowing date increased rapidly, reaching the same amounts as earlier sown plants. We measured the influence of harvesting technique and retting duration on strength and fineness. Comparison of the results of the purely visual assessment of the degree of retting with the Near Infrared Spectroscopy (NIRS) results shows a good correlation. The NIRS method can supply a reproducible method of analysis for retting. In 1998 we examined damage to the fibres due to the wet conditions during retting. In 1997 an increase in retting time led to a decrease of fibre bundle width. In the North German region, with high humidity in autumn, early sowing is advantageous. For both years early sowing in combination with early harvesting proved the optimal way to get a good yield and a secure collection of the stems after retting.

KEYWORDS. *Cannabis sativa* L., sowing date, plant development, pure fibre content, harvesting technique, retting, separation, fibre quality, strength, fineness

Byssinosis in Hemp Mill Workers

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John M. McPartland

This review article concerns byssinosis, a respiratory disease that affects workers in textile mills. According to experts in the field of occupational medicine, hemp mill workers suffer worse than workers in flax, cotton, jute, and sisal mills. The causative factor in hemp dust has not been determined with certainty. However, this review assembles evidence that implicates hemp dust contaminated by bacterial endotoxins, rather than fungal toxins or constituents in hemp itself. Endotoxins are expressed by Gram negative bacteria, and *Enterobacter cloacae* is a prime suspect. It is proposed that endotoxin contamination occurs during the biological retting process, and not before (in living hemp plants) or after (within the textile mill). Methods of preventing and treating byssinosis are assessed, including some new proposals for management.

KEYWORDS. Byssinosis, Monday chest tightness syndrome, asthma, hemp retting

OTHER CONTRIBUTIONS

Current Status of Hemp Production and Transformation in Spain 45
Gil Gorchs
Jaume Lloveras

Hemp has long been a traditional crop in Spain, although it almost disappeared in 1972. In that year the paper industry started using hemp as a raw material, and as a consequence, there was a renewed interest in the crop. At present, hemp is mainly grown in northeast Spain (800 ha). Farmers appreciate its agronomic and economic advantages but the future of the crop depends on the effect of the recent EU regulations and the ability of the industry to develop new hemp based products. The objective of this paper is to describe the hemp cropping practices, fibre processing and uses in Spain.

KEYWORDS. Hemp, *Cannabis sativa* L., fibre crops, crop production, crop management, gross margin, processing, uses, regulations

Proposal of the European Industrial Hemp Association (EIHA)
for the Reform of the European Union Flax and Hemp
Processing Subsidy 65
Michael Karus

This proposal for the reform of the flax and hemp processing subsidy by the European Union has been developed in cooperation with a large number of primary processors and Natural Fibre Associations. It tries to further improve the current regulations. The control and bureaucracy expense should be considerably reduced, and more attention should be paid to the different interests of the primary processors and the fibre qualities. At the same time a more secure future will be provided to the short and total fibre producers.

KEYWORDS. Flax, hemp, long fibre, processing subsidy, short fibre

Manitoba Fibre Conference Shows Commonalities—May
Stimulate Industries 71
Arthur Hanks

A conference like AgFibe 2002—covering all potential agfibres such as wheat straw, linseed flax straw and hemp—allows people to put their heads together over common, shared problems. With participants drawn from several disciplines—almost 30 speakers—a deep pool of knowledge was created that made for a stimulating, exciting treat. The conference made it clear that successful fibre processing is not simply a question of growing fibre, processing it, and selling the fibre to willing and rich buyers downstream. What a successful fibre value chain does is link grower, processors and buyers into a continuum that allows for a steady, continuous and regular supply of fibre.

KEYWORDS. Fibre, Canada, processing

THE WIDE WILD WORLD OF HEMP

Food for Thought
John E. Dvorak

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In this column, John E. Dvorak provides insight into some of the best industrial hemp websites on the Internet. Areas covered in detail include news portals, hemp associations, new products and research sites. Reviews relating to specific topics such as hemp food, textiles, paper and other industrial uses will also be periodically touched upon. The ever-changing nature of the world wide web will be reflected in the many different types of websites reviewed. While the focus of this column is on North America, a concerted effort is being made to incorporate as many sites from as many countries as possible.

KEYWORDS. Cannabis, industrial hemp, hempseed, hemp seed, hempnut, fiber, clothing, nutrition, food, news, history, politics, paper, plastic, concrete

HEMP PRODUCTION NOTES

Production of Hemp Sowing Seed in Poland
Henryk Burczyk

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The basic factor determining the yield of industrial hemp is the use of high-quality sowing material. Obtaining good sowing material requires extensive knowledge and rich experience on the part of the seed producers. The rules regarding the production of sowing material for industrial hemp are regulated by the relevant act of Polish Parliament. The farmers and the organizations involved in seed processing, storage and state control should obey those rules. First of all attention should be paid to genetic stability, the presence of male plants in seed plantations and the obligation to remove them. Furthermore the appropriate distance between seed plantations should be observed, considering the allogamy (wind pollination) of this species. The state services conduct relevant control during the vegetation period and carry out laboratory assessment of seed. The positive results of tests provide producers with a qualification certificate, which is the base for the further distribution of the sowing material. The disqualified seed, i.e., having low germination power, low weight of 1,000 seeds or high moisture can be used for technical purposes in the industry, e.g., for the production of oil for pharmaceutical and cosmetic applications.

KEYWORDS. Industrial hemp, sowing material, seed plantations, seed quality control