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IVC: Man-Made Fibers – A Contribution to the Ecological Future

The growing trend and the rising demand for eco-friendly and under socially acceptable conditions manufactured textiles has eco labels and collections sprout from the very ground. Labels like “Nature”, “Bio” or “Eco” are so far not protected, what clothing is concerned. A fast judgement according the motto “Nature is better than Chemistry” however is not justified, since in the total eco balance the synthetic fiber behaves more favorable than cotton. Besides energy and resource expenditure there are also factors like use of machines, fertilizers, finishing and transport costs to take into account, as Dr. Wilhelm Rauch, managing director of the Industrievereinigung Chemiefaser e.V. / IVC (www.IVC-V.de), explained in his lecture “Man-made fibers - a Contribution to the Ecological Future“ on the occasion of the 46th International Man-made Fibre Conference this year Dornbirn/ Austria.

His assessment is that chemical fibers are not only conducive to ecological sustainability but are a means to overcoming of ecological problems. Man-made fibers are designed specifically on a molecular level for a special application area. Compared to the manufacturing of natural fibers emissions and byproducts are negligible, he said. Combined with the search for alternative raw materials the call for use of renewable primary products gets louder. In the textile sector there are also voices to hear which propagandize the intensified cultivation of natural fibers for this reason.

This demand shows that the connection, still known until one hundred years ago, between a strong use of natural fibers and famine has been lost. The first signs of the fact that this connection has still a validity nowadays are visible in the global surge of food prices since agricultural areas are more and more used for purposes of agricultural use for industrial raw materials. Therefore, chemical fibers constitute even today an exoneration of the agricultural areas and contribute their share in sustainability, without aggravating the food situation.

Merely 0.8% of the current crude oil production are needed for the worldwide manufacturing of synthetic chemical fibers. Even the cellulose chemical fibers are competing in no way with food production, as Rauch stated in Dornbirn. Only 0,2% of the worldwide wood chopped off is being used for the extraction of cellulose for the production of cellulose chemical fibers. Moreover, this wood comes from sustainably run plantations or minor yield areas. Comparing the area necessary to produce one ton of fibers, the wool production takes 67 ha, the cotton production 1.3 ha, while for rayon fiber production there is only 0.8 ha needed and nearly no agricultural area at all for synthetic fiber production.

The sustainability of man-made fibers compared to natural fibers is even clearer – according to Rauch – when looking at the area that is worldwide needed for fiber production. The pasturage currently used for production of wool adds up to 867,000 sqkm (69% of the total fiber production area), for the cotton cultivation are 344,000 sqkm (27%) used. By contrast, 44,000 sqkm (3.5%) of this area are enough to produce rayon fibers and only 400 sqkm (0.03%) to produce synthetic fibers. Thereby the expenditure of area is inversely

proportionate to their productiveness. With only 3.5% use of area man-made fibers cover 60% of the worldwide fiber production. By contrast, 27% of the area (cotton) give only 38% of cotton fibers or 55% of area (wool) give only 2% of wool fiber share of the world fiber production.

According to the IVC-director the consumption of enormous amounts of water for artificial irrigation at cotton cultivation is alarming. The natural precipitation, however, is sufficient for the growth of the wood for rayon fibers. The water consumption for the production of one ton of fibers of cotton is specified with 25,000 m³, for rayon with 350 m³ and for polyester with 4 m³. Without man-made fibers there would be neither enough agricultural area for the food production nor enough water supplies for the nourishment of the human race available. Man-made fibers have, compared to natural fibers, furthermore the advantage that they can be produced where there is a respective demand in the market, as was emphasized.

They are used for optimizing the mobility, construction products, industrial applications as well as medicinal articles. Neither modern sportswear nor airbags or seat belts or inherent flame-retardant textiles would be possible without man-made fibers. They perform valuable ecological services, as Rauch stressed. Cellulose chemical fibers are biodegradable and synthetic fibers can be recycled in a process over the monomer-path and used again. Also do many chemical fibers consist already of recycled raw materials, e.g. around 40% of the PET-bottles used in Europe per year are worked up to fibers. Not least it is possible to regain the energetic part which is contained in the chemical fibers and be used in the form of long-distance heating; valuable primary energy is saved this way. The conclusion of the IVC: “Man-made fibers are not the cause of environmental problems, but a means to overcoming them, and they contribute to ecological sustainability.”

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