TOOLS
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Use of resistant/tolerant varieties

Systems

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WHAT IS…	Different varieties of different crops have different levels of tolerance towards attack by pests and diseases. If a variety is not affected by an attack at all, it is said to be resistant towards this pest or disease.
WHY	The use of resistant or tolerant varieties is one of the cornerstones of Integrated Pest Management (IPM). By always using the most tolerant variety, the use of pesticides may be kept at a minimum. It is however very important to remember, that the level of tolerance may shift over time as, for example, the disease population also adapts. Varieties that might have been resistant or very tolerant to mildew (*Blumeria spp*.), for example, for several years may over a short period of time show significant increases in attack. Therefore, it is also important to monitor and test the varieties annually, to try to forecast the development in tolerance.
HOW	The key to success is to choose varieties which are competitive from an economic point of view, while at the same time showing a low susceptibility towards the important pests and diseases. Therefore, whenever a choice of variety has to be made, search relevant databases or similar for information on the properties of specific varieties (see Sources). The table below shows nine of the most important winter wheat varieties in Denmark (all figures in euro/hectare): **Variety** / **Gross yield** / **Net yield** / **Cost fungicides, incl. application** Hereford / 950.34 / 848.59 / 50.47 Oakley / 945.91 / 824.30 / 70.34 Conqueror / 932.08 / 816.38 / 64.43 Mariboss / 927.52 / 818.79 / 57.45 Frument / 925.23 / 813.83 / 60.13 Timaru / 913.83 / 819.73 / 42.82 Ambition / 909.26 / 797.72 / 60.27 Alfaromero / 905.91 / 801.21 / 53.42 Tuareg / 881.88 / 761.61 / 68.99 The table gives an insight into the dilemma that the farmer is facing when choosing a variety. The variety with the highest yield potential (Hereford) is also the variety that gives the highest yield when subtracting the costs of seeds, fungicides, extra N fertiliser etc. (Net yield). It is, however, not the variety which is cheapest to control diseases in. This is the variety Timaru. And even though Timaru shows

	low susceptibility towards diseases, it is not able to compete with the yield potential of Hereford. The opportunities for marketing are also important parameters for choice of variety. This is, for example, relevant for production of bread or fodder wheat.
What I have to do	Choose winter cereal variety based on the following: 1. Winter hardiness 2. Use (for example, bread or fodder) 3. Yield potential 4. Risk of lodging 5. Tolerance towards important diseases and pests This prioritised list will of course depend on the crop and region. In a training session, these tables may form the basis for a discussion with a group of farmers or advisers. For this, you can use the ENDURE documents (see Sources) or any local document about varieties and use it during a training session using participatory methods (see Methodology).
SOURCES	For information about the varieties in Europe in winter wheat or potato, see: ► http://www.eurowheat.org/EuroWheat.asp ► http://www.euroblight.net/EuroBlight.asp For information (in English) about the varieties of different crops available in Denmark, see: ► http://www.sortinfo.dk/Oversigt.asp?Sprog=uk For information (in French) about the varieties of different crops available in France, see: ► For oil-seed crops: http://www.cetiom.fr/index.php?id=2260 ► For sugarbeet: http://www.institut-betterave.asso.fr/