We are observing increasing problems with the contamination of seed lots with fungal spores, the so-called seed borne diseases. This naturally follows the increasing contamination of the field with fungal spores due to constant cultivation. As a consequence, the seed borne infections are more easily transferred to the plant and then on to the seed. In this context it is of particular relevance to mention the development of seedling blight fungi. Increasing seed size and, in the future, thermal treatment and biological agents offer good possibilities of control.

The control of seed borne diseases is of vital significance for the organic production. There is a need for developing new methods for prevention, monitoring and control and more qualified thresholds are required.

The most effective preventive method for control of seed borne diseases is to only introduce healthy seed into the system. Normally, organic agents listed in Annex IIb can only be used in case of acute risk to the crops. The regulation of seed borne diseases must, thus, be based on a risk assessment of the whole production chain.

In Germany experiments have been carried out during the last decade on the development of an irradiation installation, which irradiates the grains of treatment in order to be efficient (Winkelmann 1955) – therefore, it will probably not be economically justifiable to use this technique for commercial application.

Thermal treatment is able to control all relevant diseases in cereal, but the various types of loose smut (e.g. Ustilago nuda, Tilletia tritici and Pyrenophora teres) are sometimes not or at least not efficiently controlled. The ideal is to remove the spores as completely as possible. However, removing all spores is not always possible due to the physical properties of the seed and the contamination encountered. This is, however, the aim to achieve a level below the danger of infection.

The spores may be removed in a similar way as for bunt spores in wheat. Thermal treatment is also a possibility (Borgen and Davanlou 2000). It is often used in the future to remove seed borne fungi. In some cases, solve the problem by removing the most infected grains. Thermal treatment may, when more developed, be used in the future.

The control of loose smut is of particular importance, as this disease is difficult to control by thermal treatment. In many cases, minor seeds are not at all controlled by thermal treatment. It is therefore necessary to develop new methods of control. Biological treatments with bacteria or fungi are a potential mean of control. At present no organism or products are approved in Denmark, but in other countries products like Cedomon (Pseudomonas chlororaphis) and others can be used. In the coming years it is likely that more products will become available, and improved heat treatment techniques are being developed and are likely to be available for practice in the future.

The choice of resistant varieties is also an important component in the preventive strategy. Loose smut of barley (Pyrenophora graminea) and dwarf bunt (Ustilago nuda) may occur, but only rarely. The most serious seed borne threats to winter cereals are reported to be seedling blight fungi (Tilletia tritici) and others, which can be used. In the coming years it is likely that more products will become available, and improved heat treatment techniques are being developed and are likely to be available for practice in the future.

Biological treatments are a potential mean of control for seed borne diseases. Some biological agents have been approved and used. However, the greatest problem for biological treatments is that only a few agents are available. Some agents have also not been developed for the control of seed borne diseases, but may be effective. Biological treatments are a potential mean of control for seed borne diseases. Some biological agents have been approved and used. However, the greatest problem for biological treatments is that only a few agents are available. Some agents have also not been developed for the control of seed borne diseases, but may be effective.

Possible control measures exist, but only a few are used at present. Small seeds are statistically more infected by a number of seed borne diseases than large seeds. This is due to the fact that small seeds are more often contained in the same lot as other seeds. The highest contamination is found in the grain in the same lot as other seeds. The highest contamination is found in the grain in the same lot as other seeds. The highest contamination is found in the grain in the same lot as other seeds. The highest contamination is found in the grain in the same lot as other seeds.

Introduction
Seed borne diseases, like bunt (Tilletia tritici) and loose smut (Ustilago nuda), are common problems in the cultivation of cereals. These diseases are caused by fungi that contaminate the seed during the propagation of the crop. The infected seeds then act as a reservoir for the disease and can spread the infection to the crop when planted. The most common method of control is to use chemical fungicides, but these can be expensive and may have negative environmental effects.

In the last few decades, biological treatments have become a more popular method of control. These treatments involve the use of microorganisms, such as bacteria or fungi, that are able to control the disease. Biological treatments are generally considered to be safer and more environmentally friendly than chemical fungicides.

In recent years, there has been a growing interest in the use of biological treatments for the control of seed borne diseases. This is due to the fact that these treatments are effective, cost-effective and environmentally friendly. However, there are still some limitations to the use of biological treatments. For example, the effectiveness of these treatments can be affected by environmental factors such as temperature and humidity.

One of the biggest challenges in the use of biological treatments is the development of resistance to the microorganisms used. This can be a problem, as it can reduce the effectiveness of the treatments. However, researchers are working on developing new microorganisms that are able to control the disease without the risk of resistance.

In conclusion, biological treatments are a promising method of control for seed borne diseases. These treatments are effective, cost-effective and environmentally friendly. However, there are still some limitations to the use of these treatments, and researchers are working on developing new microorganisms to overcome these limitations.

References

Nielsen B. J. 2001: Control of loose smut in organic agriculture (Borgen and Davanlou 2000). Nevertheless, bio-agents are listed in Annex IIb in the EU regulation and are accepted by a number of certifying bodies in Europe. In the same way the use of a single or a very limited number of micro-organisms may develop into a problem in the cultivation. The spores may be removed in a similar way as for bunt spores in wheat. Thermal treatment is also a possibility (Borgen and Davanlou 2000). It is often used in the future to remove seed borne fungi. In some cases, solve the problem by removing the most infected grains. Thermal treatment may, when more developed, be used in the future.

The control of loose smut is of particular importance, as this disease is difficult to control by thermal treatment. In many cases, minor seeds are not at all controlled by thermal treatment. It is therefore necessary to develop new methods of control. Biological treatments with bacteria or fungi are a potential mean of control. At present no organism or products are approved in Denmark, but in other countries products like Cedomon (Pseudomonas chlororaphis) and others can be used. In the coming years it is likely that more products will become available, and improved heat treatment techniques are being developed and are likely to be available for practice in the future.

The choice of resistant varieties is also an important component in the preventive strategy. Loose smut of barley (Pyrenophora graminea) and dwarf bunt (Ustilago nuda) may occur, but only rarely. The most serious seed borne threats to winter cereals are reported to be seedling blight fungi (Tilletia tritici) and others, which can be used. In the coming years it is likely that more products will become available, and improved heat treatment techniques are being developed and are likely to be available for practice in the future.

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