

## Introduction to High Tunnel Production in Minnesota

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High tunnel vegetable and fruit production in Minnesota is a relatively new concept in season-extension and risk management. Initial research began about 6 years ago, while extensive research started in 2002 with the purchase of two 21'x48' high tunnels at the North Central Research and Outreach Center in Grand Rapids Minnesota. The North Central Research and Outreach Center is the most northern university research center in the continental United States, making it an ideal place for season-extension research with high tunnels. In this area of Minnesota, warm season crops such as tomatoes do not mature until late August or early September and have a very short harvest window before frost. Research has indicated that tomatoes can mature as much as four weeks earlier in high tunnels, depending on weather conditions.

While high tunnels resemble greenhouses in appearance, this is the only similarity. High tunnels do not use electricity, do not use artificial heat (except in emergency situations), use only a single layer of plastic, and achieve ventilation from natural airflow by rolling up the sides instead of using electric fans. Drip irrigation is used to water the crops.

High tunnels can have many advantages for the grower. Although container crops are sometimes an option, crops in high tunnels are typically grown in the ground, as is the case for field crops. Unlike field crops, however, the yield and quality are often far superior. Additionally, Minnesota research has indicated that high tunnels have greatly aided in the control of diseases and in reducing common vegetable pest problems. While no intensive research has been done in Minnesota regarding organic systems in high tunnels, indications are that high tunnels would provide an excellent tool for organic production in Minnesota since diseases and other pests can be controlled without chemical intervention. As a financial investment, high tunnels often can pay for themselves in one year and even return a profit, if managed properly.

High tunnel production is not without its risks, however. Growers starting in high tunnel production must realize that high tunnel production in Minnesota currently is in a learning phase, and they must be willing to experiment to find the best solutions for their own areas and crops. High tunnels, while definitely offering many advantages over traditional field production, require more labor and more intensive management. If growers do not monitor their high tunnels on a daily basis, the results can be disastrous. A few of the needed management practices may include proper variety selection, pollination management, water management, temperature management, and pruning and staking of crops.

While the future of high tunnel production in Minnesota looks bright, much research remains to be done. Many growers have contributed to the research by conducting observational trials on their own farms and reporting the results during the high tunnel session at the annual Minnesota Fruit and Vegetable Growers Show, which is held annually the first week in February at Saint Cloud. Some producers have cooperated with the University of Minnesota Extension Service and obtained grants for on-farm high tunnel research with new crops. Recently the University of Minnesota Central Regional Partnership at Staples has funded high tunnel research by helping to erect high tunnels for future research at the Central Lakes Agriculture College. Work on research and demonstration plots will begin there in the spring of 2005. For this important research to continue, growers and University staff must work together to share effort, to determine best practices, and to disseminate knowledge.

This manual is offered as a three ring binder. As additional research and high tunnel production information become available, you can easily add it to the proper sections.