



Urban Agriculture and

Backyard Season Extenders

Amended June 2020



A Blueprint Developed by the Cass Clay Food Partners

Backyard Season Extenders

This issue brief will provide background information related to backyard season extenders, specifically structures used for greenhouses and hoop houses. The brief will address the common concerns and benefits from a health, environmental, social, and economic standpoint. Appendices have been provided to share how regional jurisdictions are managing their greenhouses, hoop houses, high tunnels, and other structures as well as example policy language from other jurisdictions.

Background

The need and desire for local food has increased over the years but it has always been hard for people living in the city to get access to fresh, local food. However, with urban agriculture becoming more popular and present in many cities throughout the United States, people's access to local food is increasing. The presence of fresh food within the cities can contribute to decreasing food insecurity. Urban agriculture means the growing of plants and the raising of animals within and around cities. One of the means of growing food within the city is using structures like hoop houses and greenhouses. Residents can use these structures to grow their own food and sell it to people in the community at farmer's markets or farm stands.

Hoop houses and greenhouses are very similar, in that they allow to grow crops outside of the normal growing season, but they have some key differences that set them apart. Hoop houses, also called high tunnels, are defined as unheated greenhouses made from polyethylene covering and plastic piping that are used to extend the growing season. Hoop houses are often times temporary, however they can be permanent. Greenhouses are permanent structures that are used to grow crops throughout the whole year and use alternative ways of heating and cooling the inside environment. Deep winter greenhouses are passive solar greenhouses that limit the amount of fossil fuel required to grow crops in northern latitudes. They maximize solar energy with their east to west orientation. There are also low tunnels, also called quick hoops, that act like mini hoop houses. They are often not big enough to walk into but they cover crops enough to protect them and function as a regular hoop house would.

Season extending structures like hoop houses and greenhouses have been used successfully throughout many urban areas. But people would first need to consider zoning laws and other stipulations to discuss with city officials. Some considerations would be adhering to fire safety rules regarding the use of certain plastic coverings for hoop houses, considering the distance these structures have to be away from each other or other buildings, land usage, and height or width requirements. If a person would want to construct or install a hoop house or another structure they may have to obtain a permit, depending on where the structure will be located. They may also need to obtain a set of rules that need to be followed, for example using approved materials and using the proper amount of space.

To build a safe hoop house the proper materials need to be used. Standard materials that should be used in building a hoop house are steel pipes or PVC pipes to make the "hoops" of the hoop house. Heavy gauge galvanized steel should be the first choice of material because of its strength and durability. PVC pipes can be used when constructing smaller hobby structures in sheltered locations. When using PVC, be prepared to use bracings and cables to help the structure be more firm. As for the plastic material that covers the hoop house, UV resistant polyethylene is the most common. The thickness of the plastic can be chosen by the individuals themselves. Hoop houses are typically not permanent structures and do not need a foundation to be built underneath it. If building a permanent structure, there are different ways of heating the soil underneath the hoop house. The methods could include a rock bed that transfers heat, solar closed convection air system, or small pipes underground that circulate water. These would have to

be approved by the jurisdiction first. If a jurisdiction is to write an ordinance allowing the accessory use of hoop houses they would need take into account, some considerations. These considerations include:

- Size of the allowed structure;
- Location on a lot;
- Whether it is an accessory use or primary use;
- Permissible materials used; and
- Structure security.

Many larger cities around the United States are specifically using terms like hoop house, high tunnel, or greenhouse to describe structures that are permitted or ones that are not permitted in their city codes. This lets residents know what they can do within the city. Many smaller cities or towns have not addressed the usage of hoop house or high tunnels, but some do mention the accessory use of greenhouses. As urban agriculture becomes a large form of access to food, the usage needs to be addressed clearly in the city codes and ordinances.

The domains for evaluating season extending structures in the city are based on the health, environmental, social, and the economic benefits and concerns. Table 1 summarizes the approval of greenhouses in the local area, Table 2 summarizes the approval of hoop houses in the local area, and Table 3 lists the benefits and concerns for each domain.

Table 1. Summary of backyard structures approval for greenhouses (As of June 2020)

Moorhead	Dilworth	Clay County	Fargo	West Fargo	Cass County	Horace
Permitted*	Permitted**	Permitted***	Permitted****	Permitted**** *	Permitted**** **	Permitted*** ****

For current and additional information regarding policy provisions and stipulation in each jurisdiction, view the Frequently Asked Question Guide PDF: <https://z.umn.edu/cassclayurbanag>

**Raised beds and greenhouses are allowed but may need a permit depending on type of structure*

***Structures such as raised beds, rain barrels, root cellars, and temporary greenhouses are allowed on private property. Depending on size and type of structure, a permit may be required.*

****Accessory structures require building permit, meet zoning code standards. Accessory structures on lot meet zoning standards- lot coverage requirements, building setbacks within applicable zoning district.*

*****Allowed as accessory use. Structures up to a 10ftx12ft, either temporary or permanent, do not require permit. Structures more than 120sq ft require permit. Additional information, call building inspection at (701)241-1561*

******structures for gardening allowed as accessory use, provided that 3 feet of side line of lot is unobstructed and structures are less than 15 ft in height. Structures more than 120 sq ft need a building permit.*

******In selected zones/townships*

******All of these items are deemed accessory structures and would need to adhere to the accessory structure requirements of section 17.3.8. Permits are required for sheds and garages that are over 160 sf.*

Table 2. Summary of backyard structures approval for other season extenders, including hoop houses

Moorhead	Dilworth	Clay County	Fargo	West Fargo	Cass County	Horace
Not Addressed	Not Addressed	Not Addressed	Not Addressed	Not Addressed	Not Addressed	Not addressed

Table 3. Framework for evaluating backyard structures: Greenhouses/Hoop Houses

DOMAIN	BENEFIT	CONCERN
Health	<p>Choice over chemicals used in growing process</p> <p>Control over processing and storage of foods¹</p> <p>Control over bacteria that that your produce is exposed to</p> <p>Gardening can be a great physical activity</p> <p>Helps manage stress by being able to get outside and be active in the colder months</p>	<p>Some pieces of land may be contaminated and unfit for agricultural use⁴</p>
Environment	<p>Storm protection</p> <p>Keeps animals away from the produce²</p>	<p>Temperature regulation</p> <p>May also attract certain pests that like to live under the protected environment⁵</p>
Social	<p>If used as a business endeavor:</p> <ul style="list-style-type: none"> -Retain old customers -Attain new customers -Year-round income -Year-round employment 	<p>Size of structure</p> <p>Best for high-quality produce (tomatoes, broccoli, etc.)</p>
Economic	<p>Extended growing season</p> <p>Crops grown in hoop houses can hit the market early while prices are still high, helping to capture loyal customers for the entire season³</p> <p>Crops grown in hoop houses can have higher quality and yields than those grown in the field</p>	<p>If not properly taken care of, the hoop house or greenhouse could cost a farmer more money</p>

¹ <http://davesgarden.com/guides/articles/health-benefits-of-hoop-house-gardening/#b>

² <http://www.noble.org/ag/horticulture/hoophouse/>

³ https://attra.ncat.org/newsletter/attra-news_0509.html

⁴ <http://www.farmalliancebaltimore.org/wp-content/uploads/2012/05/Agriculture.Industrial-Renewal.pdf>

⁵ http://www.aces.edu/timelyinfo/Horticulture/2010/July/July_2_2010.pdf

**Additional concerns:*

- *Due to being located in a high wind area, structures should be properly secured to sustain high winds. Structures that become detached from the land due to wind could be dangerous to people or other property in the proximity.*
- *Hoop houses, greenhouses, and other structures may attract vandalism. Be sure to install anti-vandalism methods like motion censored lights.*

Resources

If you have questions, please contact Kim Lipetzky with the Fargo Cass Public Health Office at 701-241-8195 or klipetzky@fargond.gov.

Food and Agriculture Organization of the United Nations:

<http://www.fao.org/urban-agriculture/en/>

HighTunnels.org

<http://hightunnels.org/>

Greenhouse production systems in organic production:

<https://www.colorado.gov/pacific/sites/default/files/Organic%20Greenhouse%20Production%20System.pdf>

Deep winter greenhouses:

<http://www.extension.umn.edu/rsdp/statewide/deep-winter-greenhouse/>

Selecting your structure:

http://www.uvm.edu/sustainableagriculture/Documents/HighTunnels_SelectingStructure.pdf

High tunnel hoop house construction:

<https://web.extension.illinois.edu/bcjmw/downloads/54183.pdf>

Appendix A: Greenhouses/Hoop Houses in the Local Jurisdictions

Fargo, ND

§20-0404 - Temporary Uses

E. Time Limit

Temporary uses will be permitted for a maximum of 15 days, provided, however, the Zoning Administrator should be authorized to allow such temporary use to extend for as long as 8 months. Upon expiration of a temporary use permit, another permit for the same premises may not be obtained for at least 30 days. The applicant shall submit a written explanation of the length of time needed for the temporary use.

Examples of uses that require temporary use permits include, but are not limited to the following:

1. Greenhouses,
2. Fireworks sales (permitted outside City limits only),
3. Outdoor seating and serving area at a restaurant (must include an alternative parking plan if on-site parking area is affected),
4. On-site storage tents, trailers, or other shelter to house inventory during construction or other unusual business interruptions.

The districts that crop production is allowed are the AG, SR0, GI, and PI districts.

https://www.municode.com/library/nd/fargo/codes/code_of_ordinances?nodeId=CH20LADECO_ART2_0-04USRE_S20-0401USTA

West Fargo, ND

4-442. ACCESSORY BUILDING AND USE PROVISIONS. Accessory buildings and uses, except as otherwise permitted in this Ordinance, shall be subject to the following regulations:

1. An accessory building or use which is structurally attached to a main building, shall be subject to, and must conform to, all regulations of this Ordinance applicable to the main building.
2. No detached accessory building or use in any residential district shall exceed one story or 15 feet in height.
3. No detached accessory building or use shall be erected in any required yard, except a rear yard, nor shall it be located closer than three (3) feet to any side or rear lot line, subject to the following exceptions:
 - a. Where the rear lot line is coterminous with any alley right-of-way, the accessory building or use shall not be closer than one (1) foot to such a rear lot line except when a garage is entered from an alley at right angles, it shall not be nearer than ten (10) feet to the rear lot line.
 - b. On corner lots, an accessory building or use, including driveways on the street side, shall maintain the same side yard setback required for the main building, except for garages accessing a public street, which shall maintain a setback of 18 feet for lots of 50 feet or less and 20 feet for lots greater in width than 50 feet.
 - c. In no instance shall an accessory building or use be located within a dedicated easement right-of-way.
 - d. On through lots or double frontage lots where one of the front yards is intended to serve as the rear yard and is consistent with the other lots on the block, detached accessory buildings may be erected within twelve (12) feet of the intended rear lot line and three (3) feet of the side lot line.
 - e. Accessory buildings for townhouses may be constructed up to the interior lot line following the principal building scheme.
4. No accessory building shall be constructed upon a lot until the construction of the main building has been actually commenced.
5. No accessory building in a residential district shall exceed 1,000 square feet, except in the Rural Residential District where accessory buildings up to 1,600 square feet are allowed. Accessory buildings

greater than 1,000 square feet in the Rural Estate District and 1,600 square feet in the Rural Residential District are allowed as a conditional use.

Moorhead, MN

10-12: ACCESSORY USES:

The following are permitted accessory uses in an RLD-0, RLD-1, RLD-2, RLD-3, RMD-1, RMD-2, RHD-1 district:

- Noncommercial greenhouses and conservatories.

10-18-2: USE REGULATIONS

P. Agricultural related commercial uses:

1. Building footprints shall amount to a minimum of one thousand (1,000) square feet or five percent (5%) of the site, whichever is greater, and the buildings shall be oriented to front on adjacent arterial or collector streets. Where parcels have double frontage such as along an interstate corridor, the building shall have a similar architectural character on both frontages.

ARTICLE A. MU-1 DOWNTOWN MIXED USE DISTRICT

10-15A-3: ACCESSORY USES:

The following are permitted accessory uses in a MU-1 district:

- All permitted accessory uses as allowed in the NC neighborhood commercial district.
- Rooftop gardens.

ARTICLE B. MU-2 CORRIDOR MIXED USE DISTRICT

10-15B-3: ACCESSORY USES:

The following are permitted accessory uses in an MU-2 district:

- All accessory uses as permitted in the MU-1 downtown mixed use district.

10-15C-3: ACCESSORY USES:

The following are permitted accessory uses in an MU-3 district:

- All accessory uses as permitted in the MU-1 downtown mixed use district.
- Buildings, structures or uses accessory to the principal use and limited to not more than thirty percent (30%) of the gross floor space of the principal use.

http://www.sterlingcodifiers.com/codebook/index.php?book_id=530

Clay County, MN

1. Accessory structures over 200 square feet require a building permit and must meet applicable building codes standards.

2. If an accessory structure is 200 square feet or less, no building permit is required.

3. All accessory structures on a lot would need to meet zoning standards (whether it needs a building permit or not) – such as lot coverage requirements and building setbacks within the applicable zoning district (standards vary depending on the zoning district).

4. The total footprint of all accessory structures on a lot (such as attached/detached garages, shed, greenhouse, etc.) may be equal to or less than the total footprint of the house.

5. The total height of accessory structures on a lot may not exceed the height of the house on the lot.

Dilworth, MN

11.020 PERMITTED USES

The following are permitted uses in the Transition Zone (TZ) District:

B. NON-RESIDENTIAL USES.

1) Farming (includes crop, trees, hobby farms, etc) and Agricultural related uses subject to MPCA standards, but not including livestock operations;

2) Home Occupation;

3) Essential Services;

4) Nurseries, greenhouses, landscape material operations including retail and wholesale operations;

CHAPTER 12: SINGLE-FAMILY & LIMITED TWO FAMILY RESIDENTIAL DISTRICT (R-1) SECTION 12.030 ACCESSORY USES

4) Noncommercial greenhouses and conservatories;

CHAPTER 13: SINGLE-FAMILY & TWO FAMILY RESIDENTIAL DISTRICT (R-2) SECTION 13.030, ACCESSORY USES

4) Noncommercial greenhouses and conservatories;

CHAPTER 14: LIMITED MULTIPLE FAMILY RESIDENTIAL DISTRICT (R-3) SECTION 14.030, ACCESSORY USES

5) Noncommercial greenhouses and conservatories;

CHAPTER 15: MULTIPLE-FAMILY RESIDENTIAL DISTRICT (R-4) SECTION 15.030, ACCESSORY USES

4) Noncommercial greenhouses and conservatories;

16.030 ACCESSORY USES

The following are permitted accessory uses in the Manufactured Housing Residential District (R-5):

4) Noncommercial greenhouses and conservatories;

Cass County, ND

Greenhouses, hoop houses, and other structures are permitted according to individual township codes.

Appendix B: Backyard Structures in Regional Jurisdictions: Greenhouses/Hoop Houses

Bismarck, ND

A building permit may be issued for a new accessory building on a parcel of record with an existing single-family principal building, provided:

1) the parcel of record meets the minimum lot area requirement for a zoning lot in the district in which the parcel is located; 2) the parcel of record has its principal frontage on a dedicated public right-of-way or on a permanent, exclusive, non-obstructed access easement to a dedicated public right-of-way not less than twenty feet wide; and 3) the parcel of record is an auditor's lot or aliquot description rather than a metes and bounds description.

Commercial greenhouses are permitted to be used in certain districts throughout Bismarck, including the commercial district, agricultural district,

In the agricultural district, an accessory building may be constructed if the building is no more than the maximum of 1% of the total area, a maximum of up to 5,000 square feet. The maximum wall height should be no more than 14 feet and the maximum building height should be no more than 25 feet. If the rural single-family residency lot is at least 40 acres, then the maximum is increased to 7,500 square feet with a 16-foot wall height limit. If the rural single-family residency is at least 80 acres, then the allowable maximum space for an accessory building is 15,000 square feet and no wall height limit was listed.

Duluth, MN

The Minnesota Building Code allows individuals to build accessory structures up to 200 square feet without a permit, which would include hoop houses and greenhouses. While no permit is required to erect such a structure, it would need to meet code requirements (which for this type of structure are not well defined in the residential building code). The Minnesota zoning code would require a minimum rear yard setback of 5 feet and a side yard setback of 3 feet. In addition, the structure could occupy no more than 30% of the rear yard area.

If the structure is greater than 200 square feet, a building permit would be required and the structure would need to be reviewed by a plans examiner to insure it meets the requirements of the building code.

Grand Forks, ND

The two agricultural district allows for farming and crop production. The other districts do not address the use of these structures.

18-0208. - R-1 single-family residence district.

The following shall apply in all R-1 single-family districts:

(Q) Customary accessory uses and buildings, provided such uses are incidental to the principal use. Any accessory building shall be located on the same lot with the principal building.

18-0215. - B-2 shopping center district.

(4) *Temporary uses:*

(A) All temporary uses permitted in the B-1 limited business district.

(B) Seasonal sale of farm produce:

1. Maximum length of stay shall be for six (6) months of each calendar year.

2. Sales areas, including the produce stands, shall be set back a minimum of thirty (30) feet from the nearest right-of-way of any street or highway. Entrances and exits to the parking lot shall be a minimum of thirty (30) feet from any intersection.

(C) Greenhouse, for a period not to exceed three (3) months.

18-0216. - B-3 general business district.

Uses permitted:

(M) Greenhouses, retail.

(4) *Temporary uses:*

(A) All temporary uses allowed in B-2 shopping center district.

Also, the two agricultural district allows for farming and crop production. The other districts do not address the use of these structures.

https://www.municode.com/library/nd/grand_forks/codes/code_of_ordinances?nodeld=PTICICO

Lincoln, NE

"AG" AGRICULTURAL DISTRICT & ARTICLE 5 "AGR" AGRICULTURAL RESIDENTIAL DISTRICT
4.007 Permitted Special Uses.

i) Garden centers;

4.017. Height and Area Regulations.

1) Required Yards:

vii. Accessory buildings which are attached to or not located more than ten (10) feet from the main structure shall be considered a part of the main structure and shall comply with the front, side and rear yard requirements of the main building. Accessory buildings not a part of the main structure may be located: (Resolution No. R-12-0058, July 24, 2012) 1. in the required rear yard, but such accessory buildings shall not be nearer than two (2) feet to the side or rear lot line; such accessory buildings located in the required rear yard shall not occupy more than thirty percent (30%) of the required rear yard, and; (Resolution No. R-12-0058, July 24, 2012) 2. not nearer than a distance equal to ten percent (10%) of the average lot width from the side lot line. Resolution No. 3740, August 31, 1983) (Resolution No. R-12-0058, July 24, 2012)

27.63.430 Greenhouses.

Greenhouses are intended to be located in areas of special consideration such as designated flood plains and noise hazard districts or in urban fringe or large lot developments where such use will not have an adverse impact on surrounding residential uses. Greenhouses shall be allowed by special permit in the R-3 district under the following conditions:

(a) The minimum lot area is at least two acres;

(b) No retail sales shall be conducted on the premises;

(c) The greenhouse is an accessory use to a main residential use;

(d) All materials are stored inside buildings;

(e) Not more than twenty-five percent of the lot area may be devoted to such use;

(f) The proposed use shall not have any adverse or detrimental effect upon the values of the surrounding land uses;

(g) In order to assure such use is compatible with surrounding uses, the Planning Commission may impose more restrictive height, area, parking, and sign requirements as may be necessary. (Ord. 18480 §10; December 20, 2004; prior Ord. 13724; §3; October 31, 1983).

<https://www.lincoln.ne.gov/city/attorn/lmc/ti27/ch2763.pdf>

Mankato, MN (Blue Earth County, MN)

Sec. 24-112 Uses

(a) *Permitted uses.* The following are permitted within the A district.

(15) Greenhouses

Sec. 24-502 Uses.

(b) Conditional Uses. The following may be allowed as conditional uses within the UFD, subject to provisions of article II of this chapter.

(5) Garden nurseries and greenhouses in the RR, A, and C districts.

https://www.municode.com/library/mn/blue_earth_county/codes/code_of_ordinances

Rochester, MN

62.148 Agricultural Uses: The following is a list and description of the agricultural use categories:

1) Agricultural Production: Establishments engaged in the production of crops, plants or vines, including forestry, and the incidental sale of produce raised on the premises to individuals, or establishments in existence on the effective date of the ordinance which are engaged in the keeping, grazing or feeding of livestock for sale, value increase, or livestock increase.

5) Retail Agriculture: Establishments that are primarily engaged in providing services related to or conducting the sale at retail of horticulture and floriculture products, including nurseries, greenhouses, lawn and garden services, or ornamental shrub and tree services. These enterprises typically produce their own stock, unlike a garden center which imports from other establishments the products it sells at retail.

<http://www.rochestermn.gov/home/showdocument?id=9851>

Sioux Falls, SD

Chapter 160: Zoning

FORM DD4: DETACHED DWELLING— HISTORIC PRESERVATION

§ 160.093 ACCESSORY USES.

(2) Residential accessory buildings. No accessory buildings shall be constructed upon a lot until the construction of the main building has been actually commenced, and no accessory buildings shall be used unless the main building on the lot is also being used. Residential accessory buildings include, but are not limited to:

- A. A noncommercial greenhouse that does not exceed in floor area 25% of the ground floor area on the main building.
- C. Vegetable or flower garden.

Appendix C: Greenhouse/Hoop House Example Ordinances

Kansas City, Missouri

88-810-692 - HOOP HOUSE

A temporary or permanent structure typically made of flexible pipe or other material covered with translucent plastic, constructed in a "half-round" or "hoop" shape, for the purposes of protecting and cultivating plants. A hoop house is considered more temporary than a greenhouse.

(Ord. No. 120697, § 1, 8-23-2012; Ord. No. 120783, § 1, 10-4-2012)

Boston, Massachusetts

SECTION 89-4. Urban Farm, Ground Level.

1. Urban Farm, Ground Level.

(a) *Use Regulations.* The primary activity to be performed on an Urban Farm shall be the cultivation of plants and horticultural crops; other activities may be subject to permitting.

i. Urban Farm, Ground Level, Small. Small Ground Level Urban Farms are Allowed in all Districts and Sub districts.

ii. Urban Farm, Ground Level, Medium. Medium Ground Level Urban Farms are Allowed in all Districts and Sub districts.

iii. Urban Farm, Ground Level, Large. Large Ground Level Urban Farms are Allowed in all Industrial Districts and Sub districts. Large Ground Level Urban Farms are Conditional in all other Districts and Sub districts.

(b) *Maximum Height of Farm Structures.* Farm Structures, including but not limited to Hoop houses, sheds and shade pavilions, shall be subject to the applicable height limits in the Underlying Zoning.

(c) *Setbacks for Farm Structures.*

i. Subject to Article 10 (Accessory Uses), all Farm Structures shall be set back five (5) feet from all property lines in all Districts and Sub districts.

(d) *Design Review.* The following Farm Structures on an existing and/or expanded Ground Level Urban Farm are subject to the Design Component of Small Project Review pursuant to subsection (b) (iv) of Section 80E-2.1 of the Boston Zoning Code (Design Review Required by Underlying Zoning):

i. Any proposed Freight Container in any District or Sub district except Industrial; and

ii. Any proposed Farm Structure greater than 300 square feet located on an existing Ground Level Urban Farm or proposed Ground Level Urban Farm not undergoing Comprehensive Farm Review (See Section 89-6), and located in a Neighborhood Design Overlay District; and

iii. For all other Districts and Sub districts not within a Neighborhood Design Overlay District, any proposed Farm Structure greater than 750 square feet located on an existing Ground Level Urban Farm or proposed Ground Level Urban Farm not undergoing Comprehensive Farm Review (See Section 89-6).

(e) *Signage.* The following regulations shall apply to signage used for Urban Farms:

i. *Types of Signage:*

a. All Ground Level Urban Farms shall be required to post one (1) identification sign, not exceeding six (6) square feet in total area, attached at a height of no more than four (4) feet high to a structure or fence stating only the name of the Ground Level Urban Farm and contact information.

b. One (1) temporary sign shall be Allowed for a Farm Stand and may be displayed during sales hours but must be removed from the premises and stored inside a structure when the Farm Stand is not in operation. Temporary Farm Stand signs shall not encroach upon sidewalks, driveways and / or other rights of way, and shall be displayed so as not to create a nuisance or hazard.

ii. *Sign Design Review.*

a. Urban Farms subject to Comprehensive Farm Review (See Section 89-6) shall provide, as part of their CFR submittal, a signage plan showing proposed signage and related architectural features on the sign frontage (See Section 89-6.5(a)v).

b. Urban Farms not subject to Comprehensive Farm Review (See Section 89-6) and exceeding the requirements of Section 89-4.1(e)i.a shall be subject to Article 11 of the Boston Zoning Code,

or, alternatively, shall submit plans for signs under the Comprehensive Sign Design provisions of Article 80, Section III-80E-2 of the Boston Zoning Code.

1. Rooftop Greenhouse.

(a) *Use Regulations.* The primary activity to be performed on an Urban Farm shall be the cultivation of plants; other activities may be subject to permitting.

i. Rooftop Greenhouses are Allowed in all Largescale Commercial, Industrial, and Institutional Districts and Sub districts.

ii. Rooftop Greenhouses are Conditional in all other Districts and Sub districts.

(b) *Maximum Height.* Rooftop Greenhouses shall be no higher than twenty-five (25) feet from the roof surface.

2. Urban Farm, Roof Level.

(a) *Use Regulations.* The primary activity to be performed on an Urban Farm, or within a Farm Structure, shall be the cultivation of plants; other activities may be subject to permitting.

i. Urban Farm, Roof Level, Small. Small Roof Level Urban Farms are Allowed in all Districts and Sub districts.

ii. Urban Farm, Roof Level, Medium. Medium Roof Level Urban Farms are Allowed in Large-scale Commercial, Industrial and Institutional Districts and Sub districts. Medium Roof Level Urban Farms are Conditional in all other Districts and Sub districts.

iii. Urban Farm, Roof Level, Large. Large Roof Level Urban Farms are Allowed in Large-scale Commercial, Industrial and Institutional Districts and Sub districts. Large Roof Level Urban Farms are Conditional in all other Districts and Sub districts.

(b) *Maximum Height of Farm Structures.* Farm Structures, including but not limited to Hoop houses, sheds and shade pavilions, shall be subject to the applicable height limits in the Underlying Zoning except for Rooftop Greenhouses (See Section 89-5.1(b)).

(c) *Design Review.* The following Farm Structures on an existing and/or expanded Roof Level Urban Farm are subject to the Design Component of Small Project Review pursuant to subsection (b) (iv) of Section 80E- 2.1 of the Boston Zoning Code (Design Review Required by Underlying Zoning):

i. Any proposed Farm Structure that is visible from a public street or public open space in any District or Sub district, other than Industrial which does not about a Residential District or Sub district.

<http://www.bostonredevelopmentauthority.org/getattachment/8405c72c-7520-43ad-a969-0e27dddade7a2>

Appendix D: Examples of Greenhouses/Hoop Houses

Other cities across the United States are adopting official policies on urban agriculture. Here are some examples of those cities.

Baltimore City, Maryland



The Baltimore Sustainability Plan

Baltimore's sustainability plan is intended to complement the comprehensive plan through the introduction of 29 policy goals under seven general themes: cleanliness, pollution prevention, resource conservation, greening, transportation, education & awareness, and green economy. Under the greening theme 'establish Baltimore as a leader in sustainable local food systems' emerged as one of four main goals.

The city will utilize a variety of strategies to achieve this goal including various methods to increase cultivated land, develop an urban agriculture plan, and increase the demand for locally produced food in schools, institutions, supermarkets, and by individuals. Increased land use planning and zoning changes will be necessary to identify locations for urban agricultural infrastructure and institutions. The city will also attempt to increase city farms and community gardens on vacant and abandoned lots.

In addition, this plan includes a strategy to compile local and regional data on various components of the food system. By connecting regional and urban farms with local institutions, processing facilities, and distributors Baltimore has the potential to create a successful urban agricultural system that not only accommodates urban growers but also supports the ability of nearby farmers to tap into urban markets for locally grown products.

http://www.minneapolismn.gov/www/groups/public/@cped/documents/webcontent/convert_282989.pdf

Cleveland, Ohio

Cleveland, Ohio has recently determined that urban agriculture is a viable economic development strategy that can play a role in revitalizing its urban areas. In response, the city has updated its zoning code to protect and accommodate urban agriculture. Other cities are following Cleveland's lead and embarking on rezoning studies to determine how their cities' codes can be updated to fulfill their individual needs.

Cleveland has established an Urban Garden District within its zoning code in order to ensure that urban gardens are appropriately located on sites and represent the highest and best use for the community. The code defines community gardens, market gardens, greenhouses, hoop houses, and cold frames. Permitted main uses within the urban garden district include only community gardens and market gardens. Permitted secondary uses include greenhouses,

hoop houses, cold frames, open space, fences, signs, benches, bike racks, raised beds, compost bins, seasonal farm stands, garden art, rain barrels, chicken coops, beehives, and children's play areas. Buildings are limited to tool sheds, shade pavilions, barns, restroom facilities with composting toilets, and planting preparation houses. A list of supplemental regulations controls the specific elements of permitted accessory uses including location, height, and coverage.

Elsewhere in Cleveland's zoning code are restrictions on farm animals within the city. These codes allow for and regulate chickens, ducks, rabbits, and bees within residential areas. Goats, pigs, and sheep require at least 24,000 square feet of land within residential districts and 14,400 square feet within non-residential districts. Horses, cows, alpacas, and llamas are generally not allowed.

http://www.minneapolismn.gov/www/groups/public/@cped/documents/webcontent/convert_282989.pdf

Appendix E: Additional Greenhouse/Hoop House Information

Concordia College, Moorhead, MN



In 2010, Concordia College started the Cornucopia Organic Garden, the college's experiential learning site. In the fall of 2015, a hoop house was built to extend the growing season and allow for the growing of a diverse selection of vegetables and herbs during cooler months in the fall and the spring. Concordia's hoop house uses a solar closed convection air system to extend the season even longer by heating the soil inside the structure. Concordia College encountered several barriers before being able to build this structure. These barriers were related to the closed convection system, materials used, zoning codes and setbacks, square footage, seasonal versus permanent use, proximity of a maintenance structure to the hoop house, and its overall use. The closed convection system hoop house was the first of its kind in Moorhead and the city did not have language in its ordinances which would permit a structure to incorporate this type of heating system. To allow for this, the city adopted a new ordinance to allow for closed convection systems. Another issue with the structure dealt with its zoning, as it was planned adjacent to a residential neighborhood and zoned within an institutional district. In order for the designers of the structure to get plan approval, the city asked that neighboring residents give their consent to build the hoop house. An additional barrier in the approval process was the head house connection to the hoop house. Traditionally, the head house is connected to the hoop house or greenhouse so heat does not escape. There were fears that the plastic that covers the structure had the potential to catch on fire and that the fire could spread if it was connected to the head house. From a growing stand point, it is very important for the head house to be connected to the hoop house in order for it to maintain a proper temperature and function as it should. Ultimately, it was determined the material used to cover this structure is a specific type of plastic that is less flammable. When using the fire safe material, the hoop house would not catch fire and spread to the head house.