

Final Project: Thesaurus Construction

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LIBR 247: Vocabulary Design

San Jose State University

May 13, 2015

Introduction

This container vegetable garden thesaurus is designed to aid information retrieval and indexing within the knowledge domain of container vegetable gardening. The target audience for this controlled vocabulary includes beginning gardeners as well as hobbyist and urban gardeners growing vegetables in containers. Term selection, relationships, and notation work together to give the target audience understanding about the included terms' scope and meaning. It is important to note that the target audience for this thesaurus excludes commercial as well as home gardeners using large spaces for gardening. The type of gardening is also restricted to vegetable gardening as opposed to gardening of non-edible vegetation. This thesaurus is not designed as an exhaustive listing of terms related to gardening in general. As the focus of this thesaurus is hobbyist gardeners growing vegetables in containers, the boundaries of our domain are limited to *vegetables, environment, pests, diseases, beneficial insects, and plant care*.

Thesaurus Construction

Terms were extracted by consulting literature in the domain including both online and print resources. Initial terms were entered into a spreadsheet that grew to over 400 terms. Terms that were not specific to our domain, duplicates or not relevant were eliminated. The remaining terms were put into facets and relationships were analyzed. Scope notes were added to terms as necessary.

Our thesaurus consists of 110 preferred terms that describe container vegetable gardening concepts. Users can browse the thesaurus terms by clicking on the “thesaurus” button next to the search bar. Facets are displayed and arranged in alphabetical order. Selecting a facet allows the user to see terms in a hierarchical display within that facet. Users can then enter the term into the

search bar to find information using that term. The user is also able to perform Boolean searches if they choose.

Scope notes were created from a variety of sources. Those with no sources were created by Bethany. Other sources include Wikipedia, vocabulary.com, Green Gardeners, a professional garden and lawn service, University of Illinois Extension, and three authors. If the source was an author, the author's last name is in parenthesis at the end of the note. Wikipedia was used for *fruiting vegetables* and vocabulary.com was used for *leafy vegetables*. The University of Illinois Extension site was used to more precisely define *light* sub facets of *full sun*, *partial sun*, *partial shade* and *shade*. The scope notes for *black rot* and *diseases* came from Green Gardeners.

Thesaurus Parts and Uses

Vegetables

Our domain included various types of vegetables that are divided into facets such as *fruiting vegetables*, *leafy vegetables*, *root vegetables* and *legumes*. Users would look here to find the names of specific vegetables that they want to search for information on. As this facet can be quite large, we narrowed this to vegetables that our beginning container gardening users would most likely search for. For example, if the user is looking for information on carrots, they could enter carrots in the search bar or browse the thesaurus by facets and after selecting *vegetables* could select the facet *root vegetables*. In another scenario, the user may want to find out what other vegetables are root vegetables. They can identify these by browsing the thesaurus and then selecting *vegetables* and then the *root vegetables* sub facet.

Pests and Diseases

This is actually two separate facets. Using either of these facets will allow the user to find out more information about either pests or diseases. In this case, the user may not have a specific

pest or disease in mind but might instead want to learn more about potential pests and diseases. The user can select either one of these facets by browsing the thesaurus. They can then search under the named pests or diseases to find more information on these topics.

Beneficial insects

After finding out about pests and diseases, the user may decide that they would benefit by adding beneficial insects to their garden. Beneficial insects are insects that eat garden pests. A user looking for information on these insects could find out about them by browsing this part of the thesaurus. A term list of *beneficial insects* as well as *pests* and *diseases* can be large. We reduced this list to include *pests*, *diseases* and *beneficial insects* that our specific users would most likely look for.

Plant care

Plant care is one of the largest facets in our thesaurus. A user will want to browse this section of the thesaurus to learn how to take care of their plants. This facet includes, *fertilizing*, *maintaining*, *harvesting*, *propagating* and *watering* of plants.

Environment

Another large facet is the environment facet. Users will find information on *light*, *soil*, *nutrients*, *pH scale*, *texture*, and *climate*. Many of these facets also have sub facets. A user who wanted to find information about his *hardiness zones*, or what plants can be grown in a given region, would look here.

Examples

1. Hobbyist container vegetable gardener Sarah wants to learn more about soil amendments but she is not sure what terms to start with. She browses the thesaurus facets and sees

soil under the environment facet. She selects soil and then amendments and is presented with a list of amendment terms to use in her further research.

2. Beginner container vegetable gardener Mary wants to find out what the pests eating her tomatoes could be. She browses the thesaurus under the pest facet and sees *tomato hornworms*. She searches under this term to find out if this could be her problem.
3. Hobbyist container vegetable gardener John knows that ladybugs are good for the garden but he wants to find out what other insects are beneficial. He puts *ladybugs* in the search bar and learns of related terms such as *centipedes*, *green lacewing*, and *praying mantis*.

Final Term Selection

Terms were chosen based on how they fit into the domain. We wanted the terms to reflect the beginner type terms that our users would search with. We reviewed literature to determine what subject matter should be covered looking for repeating themes. This led us to use the facets that became our final terms. Organizational structure was designed to increase user success. Use and UF reference are included to direct the user to the correct term. For example, *chard* the preferred term and *Swiss chard* the non-preferred term are both included. If a user looks for *Swiss chard*, they will see a USE *chard* reference. Broad and narrow terms were added to create proper hierarchal structure. Scope notes were added to clarify terms and related terms are used to help the user find other search terms.

Problems encountered and how solved

The first problem we had was defining the domain. We initially started out thinking that our domain would include all types of gardening. We soon realized that this was too broad of a domain for our project and would need to include more facets and terms than our project would allow. For example, we were unsure how to define plants. There could be flowers, trees, shrubs,

vegetables, herbs the list seemed endless. We decided that we needed to narrow our focus and chose to narrow our plants to vegetables. While that helped it still seemed too broad. We limited our focus further to container vegetable gardening. We then had to address our users. Even after narrowing our focus to vegetable container gardening, our list of potential users could be large. We decided to focus on beginning or hobbyist container vegetable gardeners.

Other problems included finding a way to arrange the terms into facets. For example, we wanted to create facets for the different types of vegetables. This proved to be more complex than it sounds. Initially, we had a facet titled *leaves and flowerheads*. However, we decided that a user who is new to container gardening would probably not look under this term. In addition, it represented more than one concept. Since the majority of the terms under this facet were leafy vegetables, we eliminated the two terms that wouldn't fit this category and added two more that would and changed the facet to *leafy vegetables*. In addition, this new term is more likely to be used by our user. Similarly, we had a facet titled *pods and beans* which we decided to change to *legumes* for the same reasons.

We also considered two other facets, *containers* and *tools*. However, this increased our terms to well beyond our 100 term goal. We decided that while these facets can be important, many novice gardeners would use what they had and would consider these topics less important than the others in growing vegetables on a small scale, so they were eliminated.

Individual contribution of group members

All: Developed the domain analysis through Collaborate and email discussions, contributed at least 100 terms, performed term extraction, decided on final term selection, added scope notes.

Bethany: Created the alphabetical and classified indexes, created notation and revised facets and scope notes.

Greg: Created the presentation and helped write the first part of the introduction.

Kelly: Wrote introduction and created initial facets and hierarchical relationships.

Classified Index

beneficial insects (A)

- centipedes (A1)
- green lacewing (A2)
- ground beetles (A3)
- ladybugs (A4)
- praying mantis (A5)
- soldier beetles (A6)

diseases (C)

- black rot (C1)
- blight (C2)
- botrytis (C3)
- leaf spot (C4)
- powdery mildew (C5)
- rusts (C6)
- verticillium wilt (C7)
- yellows (C8)

environment (D)

- climate (D1)
 - frost (D1.A)
 - hardiness zones (D1.B)
- light (D2)
 - full sun (D2.A)
 - partial shade (D2.B)
 - partial sun (D2.C)
 - shade (D2.D)
- soil (D3)
 - amendments (D3.A)
 - bark (D3.A1)
 - coir (D3.A2)
 - compost (D3.A3)
 - limestone (D3.A4)
 - manure (D3.A5)
 - peat moss (D3.A6)
 - sand (D3.A8)
 - sawdust (D3.A9)
 - vermiculite (D3.A12)
 - nutrients (D3.C)
 - nitrogen (D3.C5)
 - phosphorus (D3.C7)

- potassium (D3.C8)
- pH scale (D3.D)
 - acid soil (D3.D1)
 - alkaline soil (D3.D2)
- texture (D3.E)
 - clay (D3.E1)
 - loam (D3.E2)
 - sandy (D3.E3)
 - silt (D3.E4)

pests (E)

- aphids (E1)
- cabbage worms (E2)
- Colorado potato beetles (E3)
- cucumber beetles (E4)
- flea beetles (E5)
- slugs (E6)
- snails (E7)
- spider mites (E8)
- tomato hornworms (E9)

plant care (F)

- fertilizing (F1)
 - dissolvable crystals (F1.A)
 - dry fertilizers (F1.B)
 - liquid food (F1.C)
 - plant spikes (F1.D)
 - slow release granules (F1.E)
 - slow release pellets (F1.F)
- harvesting (F2)
 - crop yield (F2.A)
- maintenance (F3)
 - deadheading (F3.A)
 - pinching (F3.C)
 - pruning (F3.D)
 - training (F3.E)
 - weeding (F3.F)
- propagation (F4)
 - seed saving (F4.A)
 - seedlings (F4.B)
 - seeds (F4.C)
 - transplanting (F4.D)
- watering (F5)
 - drip systems (F5.B)
 - self-watering containers (F5.C)

vegetables (H)

- fruiting vegetables (H1)
 - cucumbers (H1.A)
 - eggplants (H1.B)
 - melons (H1.C)
 - pumpkins (H1.D)
 - sweet corn (H1.E)
 - tomatoes (H1.F)
 - zucchinis (H1.G)
- leafy vegetables (H2)
 - broccoli (H2.A)
 - Brussels sprouts (H2.B)
 - cabbages (H2.C)
 - chard (H2.D)
 - kale (H2.E)
 - lettuces (H2.F)
 - mustard greens (H2.G)
 - spinach (H2.H)
- legumes (H3)
 - green beans (H3.A)
 - lima beans (H3.B)
 - peas (H3.C)
- root vegetables (H4)
 - beets (H4.A)
 - carrots (H4.B)
 - onions (H4.C)
 - potatoes (H4.D)
 - radishes (H4.E)

Alphabetical Index

acid soil - D3.D1

- SN
 - Soil with a pH value lower than 7.0 (Martin)
- UF
 - sour soil
- BT
 - pH scale
- RT
 - alkaline soil

alkaline soil - D3.E

- SN
 - Refers to soil with a pH value higher than 7.0. (Martin)

- UF
 - sweet soil
- BT
 - pH scale
- RT
 - acid soil

amendments – D3.A

- SN
 - A material that improves soil condition and aids plant growth. (Michalak)
- UF
 - soil amendments
- BT
 - soil
- NT
 - bark
 - coir
 - compost
 - limestone
 - manure
 - peat moss
 - sand
 - sawdust
 - vermiculite
- RT
 - nutrients
 - pH scale
 - texture

aphids – E1

- BT
 - pests
- RT
 - cabbage worms
 - Colorado potato beetles
 - cucumber beetles
 - flea beetles
 - slugs
 - snails
 - spider mites
 - tomato hornworms

bark - D3.A1

- BT
 - amendments

- RT
 - coir
 - peat moss
 - sand
 - sawdust

beets – H4.A

- BT
 - root vegetables

beneficial insects - A

- SN
 - Insects that reduce or control populations of problematic plants, pests, or improve soil.
- NT
 - centipedes
 - green lacewing
 - ground beetles
 - ladybugs
 - praying mantis
 - soldier beetles
- RT
 - pests
 - soil

black rot – C1

- SN
 - Pathological conditions caused by other organisms such as bacteria, fungi or viruses (Green Gardeners).
- BT
 - diseases

blight – C2

- SN
 - Any of several diseases (e.g. late blight, fire blight, tomato blight) resulting in wilting, withering, and browning/blackening of plants without rotting.
- BT
 - diseases

botrytis – C3

- BT
 - diseases

broccoli – H2.A

- BT
 - leafy vegetables

- RT
 - cabbages

Brussels sprouts – H2.B

- BT
 - leafy vegetables

cabbage worms – E2

- BT
 - pests
- RT
 - cabbages

cabbages - H2.C

- BT
 - leafy vegetables

carrots - H4.B

- BT
 - root vegetables

centipedes - A1

- BT
 - beneficial insects

chard - H2.D

- UF
 - Swiss chard
- BT
 - leafy vegetables
- RT
 - kale
 - lettuce
 - spinach

clay - D3.E1

- UF
 - heavy soils
- BT
 - texture

climate - D1

- SN
 - Weather conditions, in general, over a long period of time.
- BT
 - environment

- NT
 - frost
 - hardiness zones

coir - D3.A2

- BT
 - amendments

Colorado potato beetles - E3

- BT
 - pests

compost - D3.A3

- BT
 - amendments
- RT
 - nutrients

crop yield - F2.A

- SN
 - Annual output of vegetables.
- BT
 - harvesting

cucumber beetles - E4

- BT
 - pests

cucumbers – H1.A

- BT
 - fruiting vegetables

deadheading - F3.A

- SN
 - Removal of dead flower heads.
- BT
 - maintaining
- RT
 - pinching
 - pruning
 - training

dirt

- USE
 - soil

diseases - C

- SN
 - Pathological conditions affecting plant life caused by other organisms such as bacteria, fungi or viruses. (Green Gardeners)
- NT
 - black rot
 - blight
 - botrytis
 - leaf spot
 - powdery mildew
 - rusts
 - verticillium wilt
 - yellows

dissolvable crystals - F1.A

- BT
 - fertilizing
- RT
 - dry fertilizers
 - slow release granules
 - slow release pellets

drip systems - F5.B

- BT
 - watering
- RT
 - self-watering containers

dry fertilizers - F1.B

- BT
 - fertilizing
- RT
 - dissolvable crystals
 - slow release granules
 - slow release pellets

eggplants - H1.B

- BT
 - fruiting vegetables

environment - D

- SN
 - The surroundings of the plant, including man-made and biological factors.
- NT
 - climate

- light
- soil

fertilizing – F1

- BT
 - plant care
- NT
 - dissolvable crystals
 - dry fertilizers
 - liquid food
 - plant spikes
 - slow release granules
 - slow release pellets
- RT
 - amendments
 - nutrients

flea beetles – E5

- BT
 - pests

frost – D1.A

- BT
 - climate

fruiting vegetables – H1

- SN
 - Vegetable-like fruits formed from the fruits of the plants that bear them (Wikipedia)
- BT
 - vegetables
- NT
 - cucumbers
 - eggplants
 - melons
 - pumpkins
 - sweet corn
 - tomatoes
 - zucchinis

full sun - D2.A

- SN
 - Refers to exposure to sunlight for at least six hours per day (University of Illinois Extension).
- BT
 - light

- RT
 - partial sun

green beans - H3.A

- BT
 - legumes

green lacewing - A2

- BT
 - beneficial insects

ground beetles – A3

- BT
 - beneficial insects
- RT
 - soldier beetles

hardiness zones – D1.B

- SN
 - Geographic areas defined by climatic conditions, especially minimum temperatures, used to indicate the climates ranges in which a plant can thrive.
- BT
 - climate

harvesting - F2

- BT
 - plant care
- NT
 - crop yield
- RT
 - seed saving
 - vegetables

heavy soils

- USE
 - clay

kale - H2.E

- BT
 - leafy vegetables
- RT
 - chard
 - lettuces
 - spinach

ladybugs - A4

- BT
 - beneficial insects

leaf spot - C4

- SN
 - Fungal, bacterial, or viral plant diseases that cause leaves to develop discolored spots.
- BT
 - diseases

leafy vegetables – H2

- SN
 - Any of various leafy plants or their leaves and stems eaten as vegetables (Vocabulary.com).
- BT
 - vegetables
- NT
 - broccoli
 - Brussels sprouts
 - cabbages
 - chard
 - kale
 - lettuces
 - mustard greens
 - spinach

legumes – H3

- SN
 - Vegetables grown for their seedpods or seeds (Beckett).
- BT
 - vegetables
- NT
 - green beans
 - lima beans
 - peas

lettuces – H2.F

- BT
 - leafy vegetables
- RT
 - chard
 - kale
 - mustard greens
 - spinach

light – D2

- SN
 - Daily sunlight requirements for plants to thrive.
- UF
 - sunlight
- BT
 - environment
- NT
 - full sun
 - partial shade
 - partial sun
 - shade

light soils

- USE
 - sandy

lima beans – H3.B

- BT
 - legumes

limestone - D3.A4

- BT
 - amendments

liquid food - F1.C

- BT
 - fertilizing

loam - D3.E2

- BT
 - texture

maintaining – F3

- BT
 - plant care
- NT
 - deadheading
 - pinching
 - pruning
 - training
 - weeding

manure - D3.A5

- BT

- amendments

melons - H1.C

- BT
 - fruiting vegetables

mustard greens - H2.G

- BT
 - leafy vegetables
- RT
 - lettuces

nitrogen - D3.C5

- BT
 - nutrients

nutrients - D3.C

- BT
 - soil
- NT
 - nitrogen
 - phosphorus
 - potassium
- RT
 - amendments
 - fertilizing

onions - H4.C

- BT
 - root vegetables

partial shade - D2.B

- SN
 - Refers to exposure to sunlight between two and four hours per day (University of Illinois Extension).
- BT
 - light
- RT
 - partial sun
 - shade

partial sun - D2.C

- SN
 - Refers to exposure to sunlight between four and six hours per day (University of Illinois Extension).
- BT

- light
- RT
 - full sun
 - partial shade

peas - H3.C

- BT
 - legumes

peat moss - D3.A6

- UF
 - sphagnum peat
- BT
 - amendments

pests - E

- SN
 - Insects or other small animals that harm or destroy garden plants.
- NT
 - aphids
 - cabbage worms
 - Colorado potato beetles
 - cucumber beetles
 - flea beetles
 - slugs
 - snails
 - spider mites
 - tomato hornworms
- RT
 - beneficial insects

pH scale – D3.D

- BT
 - soil
- NT
 - acid soil
 - alkaline soil
- RT
 - amendments

phosphorus - D3.C7

- BT
 - nutrients

pinching - F3.C

- BT
 - maintaining

plant care - F

- SN
 - Basic gardening tasks.
- NT
 - fertilizing
 - harvesting
 - maintaining
 - propagating
 - watering

plant spikes - F1.D

- BT
 - fertilizing

potassium - D3.C8

- UF
 - Vitamin K
- BT
 - nutrients

potatoes - H4.D

- BT
 - root vegetables

powdery mildew - C5

- BT
 - diseases

praying mantis – A5

- BT
 - beneficial insects

propagating – F4

- SN
 - Starting new plants from seeds, cuttings, bulbs, etc.
- BT
 - plant care
- NT
 - seed saving
 - seedlings
 - seeds
 - transplanting

pruning - F3.D

- BT

- maintaining
- RT
 - deadheading
 - pinching
 - training

pumpkins - H1.D

- BT
 - fruiting vegetables

radishes - H4.E

- BT
 - root vegetables

root vegetables – H4

- SN
 - Vegetables grown for their roots or tubers (Beckett).
- BT
 - vegetables
- NT
 - beets
 - carrots
 - onions
 - potatoes
 - radishes

rusts - C6

- SN
 - Any of several diseases of plants, characterized by reddish, brownish, or black pustules on the leaves, stems, etc., caused by fungi.
- BT
 - diseases

sand - D3.A8

- BT
 - amendments

sandy - D3.E3

- UF
 - light soils
- BT
 - texture

sawdust - D3.A9

- BT
 - amendments

seed saving - F4.A

- BT
 - propagating
- RT
 - harvesting
 - seeds

seedlings - F4.B

- BT
 - propagating
- RT
 - seeds

seeds - F4.C

- BT
 - propagating
- RT
 - seed saving
 - seedlings

self-watering containers - F5.C

- BT
 - watering
- RT
 - drip systems

shade - D2.D

- SN
 - Refers to exposure to sunlight for less than two hours per day (University of Illinois Extension).
- BT
 - light
- RT
 - partial shade

silt - D3.E4

- BT
 - texture

slow release granules - F1.E

- BT
 - fertilizing
- RT
 - dissolvable crystals
 - dry fertilizers

- slow release pellets

slow release pellets - F1.F

- BT
 - fertilizing
- RT
 - dissolvable crystals
 - dry fertilizers
 - slow release granules

slugs - E6

- BT
 - pests

snails – E7

- BT
 - pests

soil – D3

- UF
 - dirt
- BT
 - environment
- NT
 - amendments
 - nutrients
 - pH scale
 - texture

soil amendments

- USE
 - amendments

soldier beetles – A6

- BT
 - beneficial insects
- RT
 - ground beetles

sour soil

- USE
 - acid soil

sphagnum peat

- USE
 - peat moss

spider mites - E8

- BT
 - pests

spinach - H2.H

- BT
 - leafy vegetables
- RT
 - chard
 - lettuces
 - kale

sunlight

- USE
 - light

sweet corn - H1.E

- BT
 - fruiting vegetables

sweet soil

- USE
 - alkaline soil

Swiss chard

- USE
 - chard

texture - D3.E

- BT
 - soil
- NT
 - clay
 - loam
 - sandy
 - silt
- RT
 - amendments

tomato hornworms - E9

- BT
 - pests

tomatoes - H1.F

- BT

- fruiting vegetables

training - F3.E

- SN
 - Manipulating a plant to grow into a certain shape through pruning and use of supports, twisting, bending, etc.
- BT
 - maintaining
- RT
 - deadheading
 - pinching
 - pruning

transplanting - F4.D

- BT
 - propagating

vegetables - H

- NT
 - fruiting vegetables
 - leafy vegetables
 - legumes
 - root vegetables

vermiculite - D3.A12

- BT
 - amendments

verticillium wilt – C7

- SN
 - Any of several diseases of plants, characterized by reddish, brownish, or black pustules on the leaves, stems, etc.
- BT
 - diseases

vitamin K

- USE
 - potassium

watering – F5

- BT
 - plant care
- NT
 - drip systems
 - self-watering containers

weeding - F3.F

- BT
 - maintaining

yellows – C8

- BT
 - diseases

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