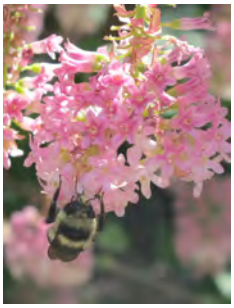
Planting for Pollinators

Ellen Zagory

Stanislaus County Master Gardener Training

September 2020



All photos by Ellen M. Zagory unless otherwise noted

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About the presenter

Ellen Zagory

- Retired Director of Horticulture, UC Davis Arboretum and Public Garden
- Consulting Horticulturist
- Master Gardener Yolo County—Gardening for Pollinators Team
- Volunteer for California Native Plant Society, Board of Pacific Horticulture Society.
- Writer and amateur photographer.

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Planting for Pollinators: Stanislaus County Master Gardener Training.

Pollinator info *already covered* in previous Zoom with Chris Howington of NRCS

- http://ucanr.edu/youtube/ucmgstanislaus

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Poll: What are your class goals?

How would you describe your knowledge level about pollinators?

- good
- average
- little
- none

What do you hope to take away from this class?

- Some easy low-water plants for bees.
- Some California native plants to use.
- Some combinations of plants will extend my bloom.
- Plants that supply the most benefit to pollinators.

Poll Slide #1

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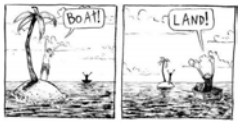
When planting, what's best depends on your **Point of View**



Pollinators Need:

•Flowers with lots of nectar and pollen (food).
•Large masses of flowers (for easy access).
•Flowers over a long season. (long availability)
•Flowers very early or very late in season. (for early and late insects)
•Diversity of plants for a diversity of bees.

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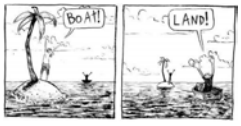
Point of View



Gardeners Need:

- Plants with lots of color and interest.
- Low maintenance if possible.
- Grow well in local conditions (Central Valley hot summer, winds).
- Water saving: Irrigation medium low to medium low.
- Sturdy and long lived plants.

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From a pollinator perspective its *all about the flowers*

- Not all flowers are created equal.
- May have only pollen, provide mainly nectar or both pollen and nectar (or neither with double petalled flowers).
- Plants that bloom for a very short time provide less food.
- Plants with lots of flowers make it easier to get food with less energy use by the insect.

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From the gardeners perspective its about "you look good, you feel good"*

- We want pretty gardens.
- Plants combined in a planting must have the same water needs.
- Its complicated to combine plants with overlapping bloom times.
- Only some plants have long bloom times.

*Deion Sanders on Twitter

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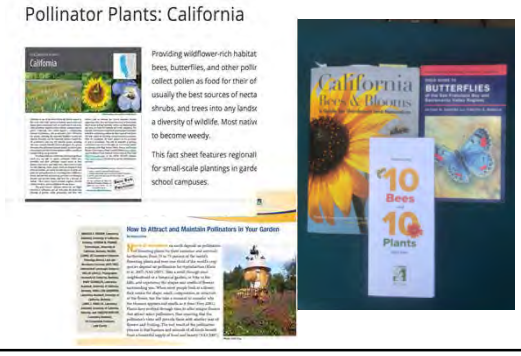
There is a dizzying amount of information available: I use UC and Xerces Society sources



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Some general guidelines that will help you be successful with plant selection

How much "natural look" can you tolerate?

- Consider *how much time you can spend* on maintenance.
- Start with California information sources *as local as possible.*
- Check if plants are perennial or annual.
- Research *plant availability* from Societies, nurseries and online.
- Make a plan that's simple to start and build from there.

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Try and use as many California natives as possible: here's why

The UC Berkeley Bee Garden studies showed:

•In urban gardens of the 1000 plants studied 950 were non-natives, only 50 were natives

But:

•80 percent of natives attracted bees (40 taxa)

•Only 8 percent of non-natives (76 taxa) attracted bees

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What about grasses?

- For visual interest they add upright delicate textures and motion when the wind blows.
- Grasses are wind pollinated
- Grass flowers lack petals and are not attractive to bees and butterflies.
- Bunch grasses do add habitat value and protected nesting spots for ground nesting bees.
- Some provide larval food for native butterflies.

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Example of an easy, all native, low-maintenance plant combination: bunchgrass, shrub, perennial.

deer grass *Muhlenbergia rigens*

(year round habitat and texture)

maritime ceanothus

Ceanothus maritimus

(woody, evergreen, spring bloom)

California fuchsia, selections

Epilobium canum

(late summer, fall bloom)

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Think about maintenance needs: comparing annuals, perennials, some woody shrubs.

Annuals: highest maintenance

- Long blooming high rate of return
- Usually they are replaced every year
- Can be weedy especially the first year.

Perennials: medium maintenance

- Deciduous or evergreen (evergreen should have fewer weeds)
- Have a wide range of sizes available.
- They can provide bloom in different seasons.
- Usually need to prune to shape and cut back once a year or more.

Shrubs: lowest maintenance

- Woody, permanent structure to the planting.
- No cutting back or replacement except shaping when young and occasional shape corrections. Fewer long bloomers.

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Pros and cons of annual plants

Best annuals

- Some will bloom all summer (with enough water) (*Helianthus annuus, Eschscholzia, Tithonia)*
- Many (but not all) native annuals are spring bloom only (lupine, poppies, clarkia, *Phacelia tanacetifolia).*
- I have little information on late season annual bloomers at this date.

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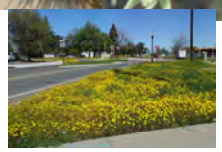
Late season annuals to investigate

- *Trichostema lanceolata,* vinegar weed

Tarweeds

- *Madia elegans*
- *Deinandra/Hemizona*

California poppies can "perennialize" and when mowed earlier and then watered will sometimes rebloom.



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Cons of seeding annuals

Typical method is to plant a whole bed:

- Bed preparation often needed to improve soil--compost addition, mixing.
- Need prior *removal of existing weeds* especially perennial weeds (bindweed and Bermuda grass)
- Weeding of seedlings is needed after germination of desired species.
- Repeat each year

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Cindy Cornett Siegle CC BY-NC-SA 2.0

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More about annuals

- Spring blooming native annuals go dormant (turn brown) in summer.
- Should be cut back or mowed to clean up after seed drop.
- Areas tend to become weedier each year since mulch is not used

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Consider starting annual in small pots or six packs

- Tuck them into the spaces between perennials in early spring.
- Water to establish.

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Poll: Types of plants

What are some of the advantages of perennials over annual plants in the garden.

1. The same plant blooms every year.
2. They require less weeding.
3. They can attract pollinators.
4. All of the above.

#2 poll question

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What plants shall I use?

What works in your local climate, soil and resources

- Create structure by using layers of tall, medium and low shrubs and perennials for creating framework.
- In the Central Valley summer heat most native plants require some summer water to look OK.
- Drought may restrict water supply and raise cost— pushing us to lower water use even more.
- Soil is often heavy silt or clay loam, with poor drainage.

Very low water landscape at the UCDavis Arboretum

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Can I mix natives and non-natives? YES

Planting at UC Davis Arboretum Nursery combines:

Natives:

Giant buckwheat *Eriogonum gianteum*

Pink buckwheat *Eriogonum grande* var. *rubescens.*

Solidago 'Cascde Creek'

Non natives:

Salvia lanceolata

Rosa 'Gruss an Aachen'

Salvia X *jamensis* hybrids

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Sages and Lavender

- Some "subshrubs" like Salvias and Lavenders are woody at base
- Lavender provides structure in an herbaceous perennial planting
- Both of these groups have members with **long season of bloom**
- Maintenance: Need seasonal shaping and deadheading.

Lavandula X ginginsii 'Goodwin Creek Gray' and *Aster* 'Purple Dome' (above)
Salvia clevelandii 'Winifred Gilman' (below)

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Salvia 'Hot Lips'

S. microphylla hybrid.

- Blooms all season.
- Acts as a dense shrub.
- Need seasonal pruning to keep dense.
- Large carpenter, sweat and honey bees.
- Here planted with deer grass, *Russellia* and crape myrtle.

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There are many other sages that are colorful and long blooming

sub-shrubs: *Salvia greggii and Salvia X jamensis hybrids*

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Salvia 'Mystic Spires'

- Blooms all season
- Bees and butterflies
- Carpenter, bumble, honeybees and more.

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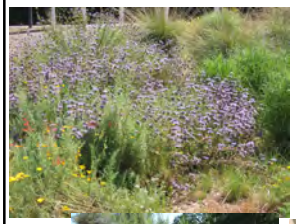
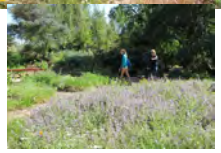
Native salvias and cultivars: for both bees and butterflies

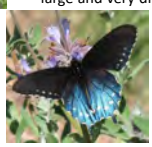


Salvia clevelandii Aromas', 'Alan Chickering', 'Winnifred Gilman' are shrub-like

Salvia 'Bee's Bliss', 'Dara's Choice' are ground covers. 'Bee's Bliss' much larger spreading.

Salvia brandegeei 'Pacific Blue' very large and very drought tolerant





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Perennial: a plant that (if it lives) blooms again next year.

- True herbaceous perennials die to ground in winter
- They are useful to supply long bloom and late season bloom.
- Many need cutting down annually
- Herbaceous Salvias, native and non-native.
- *E.g. Sedum* 'Autumn Joy' and other culivars
- *Asters,* summer and fall bloom
- Ornamental oreganoes.
- *Achillea*, yarrow, many varieties

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Some *evergreen* perennials retain foliage over winter

- *Teucrium* X *lucidrys,* prostrate germander
- *Salvias,* especially *microphylla* and some hybrids, *S.* X *jamensis*
- *Erigeron glaucus,* seaside daisy

Salvia 'San Carlos Festival', Erigeron 'W.R.'

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Poll: Evergreen vs. deciduous perennials

The advantage of evergreen perennials over deciduous perennials is:

1. They never require any pruning.
2. They are always weedy.
3. They disappear over winter.
4. None of the above.

#3 poll question

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Perennials over the seasons can provide food over "bee seasons"

Spring

Early spring and summer bloomers

- *Nepeta*, catmint
- *Scabiosa columbaria,* pincushion flower
- *Lavandula stoechas*, Spanish lavender, Erigeron karvinskianus, Mexican wall daisy

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Perennials over the seasons can provide food over "bee seasons"

Summer

- Summer to fall perennials like California fuchsia, Russian sage, (*Perovskia)* summer asters (*A.* 'Monch')
- Woody plants like barometer bush (*Leucophyllum*),chaste tree (Vitex), and Salvias.

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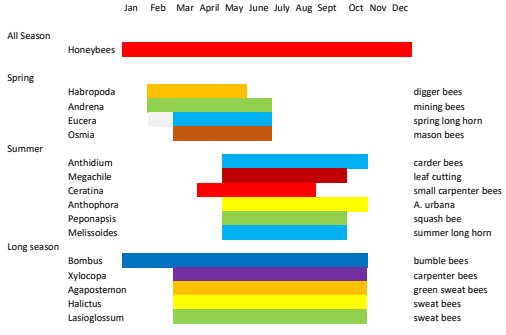
WHAT ARE BEE SEASONS? *

flight seasons of selected bee genera



Derived from * Jadallah et al. 2017. UC ANR Publication number 3552 .

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Bloom periods that overlap insect flight season

Early* (January to April)

Arctostaphylos, manzanitas

Cercis occidentalis, redbud

Ceanothus, California lilac

Berberis aquifolium, Oregon Grape

Mid season* (April to June)

Heteromeles arbutifolia, toyon

Frangula californica, coffeeberry

Grindelia camporum[P], gum plant

Phacelia californica[P],

*Seasons as used by K. Ward and N.M Williams, personal communication
[P] herbaceous perennial

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Late Season Bloom: July 10 to October 20

- *Grindelia camporum, gum plants*
- *Helianthus bolanderi,* serpentine sunflower
- *Phacelia californica,* California phacelia
- *Sphaeralcea ambigua,* desert globemallow
- Supplement with plugged annuals mentioned if possible.

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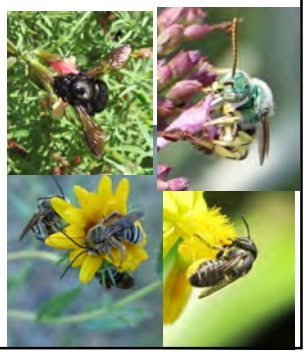
Interested in learning bee ID?

- Put on your "bee eyes".
- Compare to size of honeybee.
- Start with the big ones first! *(Xylocopa*, large carpenter)
- Colorful ones (green sweat bee)
- Antenna length for longhorn bees.
- Where carry pollen: leg or abdomen indicates families.



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Frankie et al*: Research results put plant attraction in categories

- Attract restricted bee groups
- Attract diverse (prominently 2-3) bee groups
- Taxa that attract diversity of bees no prominent groups

*California Agriculture. 2009. 63 (3):113-120

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Frankie et. Al, 2009

TABLE 2. Ornamental plants and their origins and flowering season visited by diverse bee taxa with no prominent bee groups in seven California cities, 2005-2007

Plants	Family	Flowering season	Origin*
Monch (*Aster x frikartii*)	Aster.	Summer	NN
Bidens (*Bidens ferulifolia* cvs)†	Aster	Spring/summer	NN
Coreopsis (*Coreopsis grandiflora* cvs)†	Aster.	Summer	NN
Cosmos (*Cosmos bipinnatus*)	Aster.	Summer	NN
Cosmos (*C. sulphureus*)	Aster.	Summer	NN
Sea daisy (*Erigeron glaucus*)‡	Aster.	Spring/summer	CA
Black-eyed Susan (*Rudbeckia hirta*)§	Aster.	Summer	NN
Tansy phacelia (*Phacelia tanacetifolia*)	Hydro.	Spring	CA
Catnip mint (*Nepeta* spp.)¶	Lamiac.	Spring/summer	NN
Rosemary (*Rosmarinus officinalis* cvs)#	Lamiac.	Spring/summer	NN
Black sage (*Salvia mellifera*)	Lamiac.	Spring	CA
Wild lilac (*Ceanothus* spp.)**	Rham.	Spring	CA
Toad flax (*Linaria purpurea*)	Scroph.	Spring/summer	NN

* Origin: CA = native to California; NN = nonnative to California.
† cvt. = several cultivars.
‡ Mostly *E. glaucus* 'Wayne Roderick'.
§ Mostly large, single-flower cultivars.
¶ Mostly catnip mint species (*Nepeta x faassenii* and *Nepeta* 'Six Hills Giant').
# Several cultivars, especially *R.* 'Ken Taylor' and *R.* 'Lockwood de Forest'.
**Mostly *C.* 'Ray Hartman', *C.* 'Julia Phelps' and *C. thyrsiflorus* 'Skylark'.

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Perennial and woody plants attractive to 2 or 3 bee groups (ones thriving in Davis)

- *Solidago californica*, goldenrod
- *Lavandula* spp., lavender
- *Perovskia atriplicifolia*, Russian sage
- *Vitex agnus-castus*, chaste tree
- *Gaillardia* X *grandiflora*, blanket flower

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Poll: flower preferences

Do bees have flower preferences?

True

False

#4 Poll question

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Combining plants takes trial and error
Early season (left) Mid season (right)

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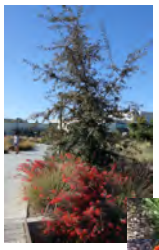
The hardest part is late season

- Once its 100F many plants shut down
- Not as much information on late season blooms.
  - Epilobium canum, Ca fuchsia
  - Gaillardia, blanket flower



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Beware: Some recommended plants that can spread about

- Some may be *aggressive* in gardens if irrigated
- Very useful in low water area!
  - *Aster* 'Point St. George
  - *Solidago californica*
  - *Epilobium canum (some cvs.)*
  - *Origanum* cultivars (seeds about)

50

Not all cultivars are created equal. Look for ones growing in gardens near you

- May be **short-lived** or intolerant of heavy soils.
  - *Agastache species*
  - *Gaillardia*, blanket flower
  - *Sphaeralcea ambigua* globe mallow
  - Bidens ferulifolia

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Some need a little more maintenance

Need **deadheading** to keep them in bloom

- *Erigeron glaucus* and E. 'W.R.'
- *Coreopsis grandiflora,* tickseed
- *Gaillardia,* blanket flower

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There are “tough ones” long-lived in the Arboretum, low water

- *Perovskia atriplicifolia,* Russian sage (can see about a bit)
- *Nepeta* X *faasennii,* catmint
- *Scabiosa ochroleuca*



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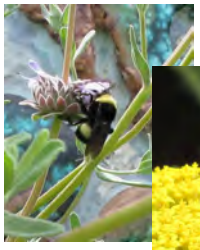
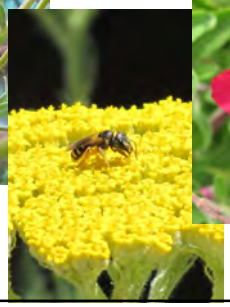
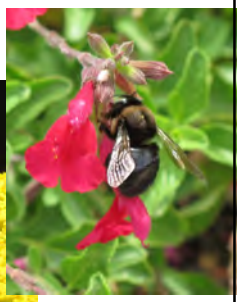
What are best plants we have seen so far?

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Native Bees, Native Plants and Crop Pollination*

Plant species	Currently used in hedgerow or tailwater plantings	Important crop visitors	Other crop visitors	Parasitic bee crop visitors	Non-crop visiting bees	All bees
*Heteromeles arbutifolia**	Y	10	8	1	20	39
Eriogonum fasciculatum	Y	8	8	4	11	31
*Baccharis salicifolia**	Y	5	8	0	19	32
*Mimetella lasciculata**	–	5	2	0	1	8
*Eriodictyon californicum**	–	4	4	1	26	35
*Cercis occidentalis**	Y	4	9	1	10	21
*Rosa californica**	Y	4	1	1	0	6
*Lotus scoparius**	–	3	3	0	15	21
*Adenostoma fasciculatum**	*	3	7	1	3	14
*Lupinus succulentus**	–	3	1	0	3	6
*Cornus sericea**	*	3	3	0	1	6
Eremocarpus setigerus	–	3	1	1	1	6
Eriophyllum lanatum	–	2	2	0	8	12
*Baccharis pilularis**	Y	2	4	0	6	12
Hemizonia simplex	–	2	0	0	1	3
Lupinus microcarpus	–	2	0	0	1	2
*Ceanothus cuneatus**	Y	1	8	0	11	20
*Lepechinia calycina**	–	1	4	1	10	16
*Epilobium canum**	*	1	4	0	4	9
Stephanomeria virgata	–	1	1	0	4	6
*Salix lasiolepis**	Y	1	4	0	2	7

Toyon
CA buckwheat
--

Redbuds

Chamise
Lupine (ann)

Wooly sunflower
Coyote brush

California lilac

California fuchsia

* Kremen C, et. Al. 2002. Fremontia 30: 3-4, p.46.

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Woody plants visited by diverse bee taxa:

UC Berkeley Urban Bee Lab.

- *Rosmarinus officinalis,* rosemary
- *Ceanothus*, California lilac
- *Salvia mellifera*, black sage

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Early shrubs: *Arctostaphylos densiflora* 'Howard McMinn'

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Western redbud: native to the Putah Creek watershed "native here"

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Ceanothus 'Ray Hartman'

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California Lilac

- *Ceanothus maritimus* 'Valley Violet'
- *Ceanothus* 'Concha'

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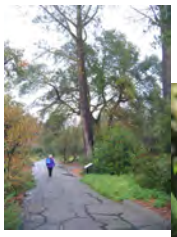
Toyon
Heteromeles arbutifolia



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Berberis aquifolium ‘Compactum

- shiny, evergreen
- Yellow flowers in spring
- A number of different varieties available

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Some recommended plant groups: buckwheats

Eriogonum grande var *rubescens*

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Eriogonum fasciculatum
California buckwheat

64

Lavandula 'Goodwin Creek Grey'
Lavandula angustifolia, English lavender.


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Seaside daisy (*Erigeron*)
Popular with many bees


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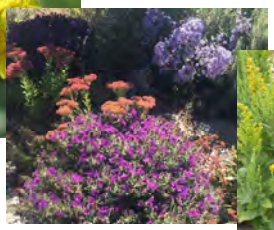
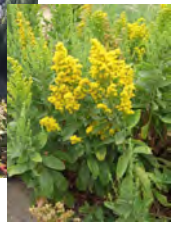
for later season bloom: Goldenrod and asters

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Sedum 'Autumn Joy', many new varieties too

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Poll: Plants to use

Manzanitas, California lilacs and redbuds are great to plant for supporting early pollinators.

True
False

#5 poll question

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Combinations of Mediterranean and California plants **early season**

- Catmint (*Nepeta X faasennii)*
- Toyon or Christmas berry (*Heteromeles arbutifolia)*
- Seaside daisy (*Erigeron* 'W.R.')

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Natives can be arranged in pleasing combinations: **mid to late season**

goldenrod
Solidago 'Cascade Creek'

pink buckwheat
Eriogonum grande var. *rubescens*

California fuchsia
Epilobium canum

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Perennial plants visited by diverse bee groups

- *Aster* X 'Monch'
- *Bidens ferulifolia,* beggars tickseed
- *Coreopsis grandiflora,* tickseed
- *Erigeron glaucus,* seaside daisy
- *Rudbeckia hirta*
- *Nepeta* spp.

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Abundance and diversity of bee groups is our goal!

- Attract and support many different kinds of insects.
- Helps build garden diversity and support wild bees.
- *Perhaps highest rated plant should be used* despite increase in maintenance and water use

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All of this effort is to increase diversity

- More plant types and larger patches result in greater abundance and diversity
- Diversity of ecosystems contributes to their stability under stress

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Butterfly populations peak in late summer and fall

- Many of the same plants that bees visit will be visited by butterflies.
- There are additional plants to add, most important are larval food plants.
- Learn what butterflies occur in your area and plant for that.
- Butterflies can take up a whole additional hour!

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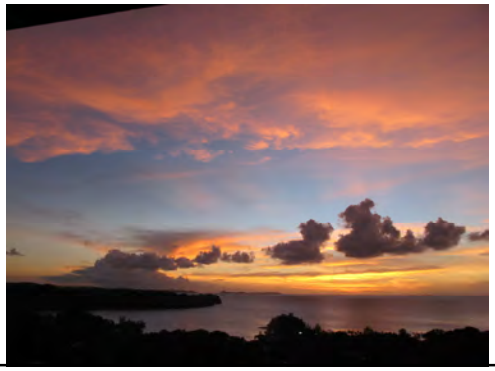
Questions?



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- UC Davis Honeybee Haven https://beegarden.ucdavis.edu
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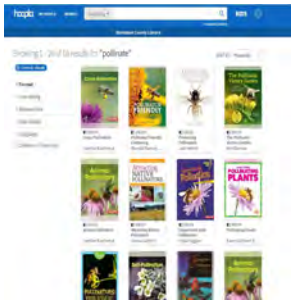

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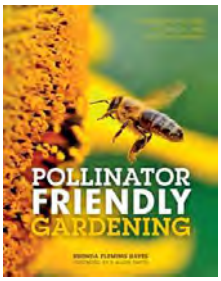

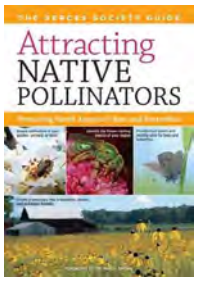

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