



GARDENING FOR BUTTERFLIES, BEES AND OTHER POLLINATORS

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- I. WHAT IS POLLINATION? - THE TRANSFER OF POLLEN FROM THE ANTHOR OF ONE FLOWER TO THE STIGMA OF THE SAME OR ANOTHER FLOWER SO THAT THE SPECIES CAN REPRODUCE.**

- II. BEES**
 - A. THERE ARE 4,000 TYPES OF BEES IN NORTH AMERICA, MOST OF WHICH ARE NOT HONEY BEES.**
 - B. HONEYBEES ARE NON-NATIVE BEES, BUT ARE IMPORTANT BECAUSE THEY DELIBERATELY GATHER POLLEN TO FEED THEIR YOUNG AND THEMSELVES. THEY OVERWINTER COMMUNALLY IN THEIR HIVES. NOT ALL BEES LIVE IN HIVES. NOT ALL BEES SURVIVE OVER WINTER.**
 - C. BUMBLEBEES ARE NATIVE BEES THAT CAN FORAGE IN COOL WEATHER UNLIKE MOST BEES. THEY CAN FORAGE UP TO A MILE AWAY, WHICH IS A LONG DISTANCE FOR A BEE. ONLY THEIR QUEEN AND THEIR LARVE SURVIVE WINTER.**
 - D. 70% OF OUR NATIVE BEES ARE SOLITARY BEES LIVE THAT ALONE IN HOLES IN THE GROUND, SOFT WOOD OR HOLLOW REEDS. THEY TEND TO BE GENTLE, SO IF YOU ARE STUNG BY AN INSECT THAT FLEW OUT OF A HOLE IN THE GROUND IT IS PROBABLY A WASP/HORNET, NOT A BEE.**
 - E. BEES ARE RED-BLIND. THEY PREFER BLUE, PURPLE, YELLOW, AND WHITE FLOWERS.**

- III. BUTTERFLIES**
 - A. LESS EFFICIENT POLLINATORS THAN BEES. THEIR LONG LEGS DON'T PICK UP AS MUCH POLLEN AS SHORTER, HAIRIER BEES. THEY CAN ACCESS SOME FLOWERS WITH THEIR LONG PROBOSCIS THAT BEES CAN'T.**
 - B. BUTTERFLIES PREFER WARM TEMPS AND SUNSHINE. YOU WON'T FIND AS MANY BUTTERFLIES IN SHADE GARDENS AS IN SUNNY GARDENS.**
 - C. SOME BUTTERFLIES AND OTHER INSECTS ARE SPECIALISTS, SUCH AS MONARCHS WHICH ONLY LAY EGGS ON MILKWEED PLANTS WHICH PUTS THEM IN JEOPARDY.**
 - D. BUTTERFLIES LIKE BRIGHT-COLORED, FLAT FLOWERS THEY CAN LAND ON, SUCH AS ASTERS, ZINNIAS AND DAHLIAS.**

- IV. MOTHS**
 - A. MOTHS ARE IN THE SAME FAMILY AS BUTTERFLIES (LEPIDOPTERA), BUT THEY ARE MOSTLY OUT AT NIGHT.**
 - B. THEY TEND TO POLLINATE LIGHT-COLORED, NIGHT-BLOOMING FRAGRANT FLOWERS THAT ARE EASIER TO LOCATE IN THE DARK.**

- C. UNFORTUNATELY THE BEAUTIFUL HAWK MOTH THAT IS EASILY MISTAKEN FOR A HUMMINGBIRD COMES FROM THE TOMATO HORNWORM, VERY UNPOPULAR IN A TOMATO PATCH!

V. FLIES

- A. FLIES BELONG TO THE LARGEST INSECT ORDER ON EARTH.
- B. FLIES ARE FREQUENT FLOWER VISITORS.
- C. SOME KINDS OF FLY LARVAE EAT OTHER INSECTS SUCH AS APHIDS.
- D. SOME FLIES FILL IN FOR BEES DURING COOL WEATHER AND POLLINATE EARLY OR LATE-BLOOMING FLOWERS.
- E. FLIES HAVE A PREFERENCE FOR FLAT, WHITE FLOWERS (SUCH AS BLOODROOT, STRAWBERRY, ONION AND CARROT BLOSSOMS). THEY ALSO ARE ATTRACTED TO PUTRID SMELLING FLOWERS LIKE SKUNK CABBAGE, A VERY EARLY BLOOMER.

VI. WASPS

- A. ALTHOUGH USUALLY UNAPPRECIATED, WASPS ARE GOOD POLLINATORS, BUT NOT AS GOOD AS BEES BECAUSE THEY ARE HAIRLESS.
- B. RECENT DISCOVERIES ARE GIVING US A NEW APPRECIATION OF WASPS: SOME TYPES EAT THE LARVAE OF THE EMERALD ASH BORER, AND ANOTHER TYPE PREYS ON FLIES THAT PESTER DAIRY CATTLE.
- C. ALTHOUGH SOCIAL WASPS ARE AGGRESSIVE, THEY ARE DOCILE WHEN VISITING FLOWERS FOR NECTAR.

VII. BEETLES

- A. 30,000 SPECIES IN NORTH AMERICA.
- B. BEETLES ARE ATTRACTED TO BOWL-SHAPED FLOWERS SUCH AS WATER LILIES.
- C. THEY ALSO LIKE SPICY, SWEET OR FERMENTED SMELLING FLOWERS.
- D. UNFORTUNATELY FOR THE BEETLES, THEY NOT ONLY LIKE POLLEN, BUT SOME EAT THE FLOWERS, TOO, WHICH GIVES ALL BEETLES A BAD NAME. GARDENERS HAVE TO DECIDE IF THEY ARE WILLING TO ACCEPT THE TATTERED APPEARANCE OF A FEW FLOWERS IN EXCHANGE FOR THE POLLINATION SERVICE.

VIII. HUMMINGBIRDS, BATS, MOSQUITOS

- A. HUMMINGBIRDS NOT ONLY ARE ATTRACTED TO DEEP-THROATED RED FLOWERS SUCH AS COLUMBINE, BUT THEY LIKE SOME DEEP-THROATED BLUE FLOWERS LIKE LOBELIA.
- B. BATS POLLINATE SOME TROPICAL FRUITS SUCH AS BANANAS. IN OUR REGION THEY POLLINATE AGAVE, BUT NO FOOD CROPS.
- C. MOSQUITOS (BELIEVE IT OR NOT) IN OUR REGION POLLINATE SUCH FLOWERS AS GOLDENROD AND BOG ORCHIDS.

IX. THREATS TO POLLINATORS

- A. HABITAT LOSS - 90% OF ORIGINAL GRASSLANDS IN THIS COUNTRY HAVE BEEN PLOWED UP FOR FARMLAND OR DEVELOPMENT.**
- B. ALIEN SPECIES OF BOTH PLANTS AND INSECTS**
- C. DISEASES SUCH AS PARASITES OR MITES AND FUNGAL DISEASES IN BEE COLONIES**
- D. CLIMATE CHANGE**
- E. SYSTEMIC INSECTICIDES ARE ABSORBED BY THE ENTIRE PLANT, SO THAT ALL PARTS OF THE PLANT ARE TOXIC. RAIN WILL NOT WASH OFF THE TOXIN.**
- F. GENETICALLY MODIFIED CROPS - GMOS HAVE HAD THEIR DNA ALTERED. THEY MAY BE INSECT-RESISTANT OR HERBICIDE RESISTANT. FIELDS CAN BE SPRAYED WITH AN HERBICIDE AND EVERYTHING IN THE FIELD EXCEPT THE CROP WILL DIE, INCLUDING MILKWEED AND OTHER FOOD-SOURCE "WEEDS" LIKE CLOVER AND DANDELIONS.**

X. HOW WE CAN HELP

- A. PLANT FLOWERING PLANTS, ESPECIALLY NATIVES, INCLUDING TREES.**
- B. HAVE SOMETHING IN BLOOM FROM EARLY SPRING INTO FALL.**
- C. USE PESTICIDES AND HERBICIDES AS A LAST RESORT.**
- D. LEAVE SOME BARE GROUND FOR GROUND-NESTING BEES.**
- E. RESPECT BUG AND PLANT DIVERSITY. BAD BUGS MIGHT HAVE A GOOD SIDE (MOSQUITOS AND WASPS), OR THEY MAY BE FOOD FOR OTHER BUGS/BIRDS.**
- F. LET SOME "WEEDS" LIKE DANDELIONS, CLOVER AND THISTLES LIVE.**
- G. LET SOME OF YOUR VEGETABLES BOLT AND YOUR HERBS GO TO FLOWER.**
- H. PLANT DILL FOR BEES EVEN IF YOU DON'T USE IT.**
- I. CONSIDER A SMALLER LAWN WITH A WIDER FLOWER BORDER.**
- J. CONSIDER NON-GRASS LAWN ALTERNATIVES SUCH AS CLOVER.**
- K. PROVIDE A SHALLOW WATER SOURCE THAT INSECTS CAN USE, SUCH AS A BIRD BATH WITH A ROCK FOR AN INSECT PERCH.**
- L. IF YOU HAVE THE ACREAGE, PLANT A BEE-PASTURE WITH ALFALFA. ORCHARD GROWERS SOMETIMES PLANT BEE PASTURES NEXT TO THEIR FRUIT TREES.**
- M. LET YOUR PERENNIALS STAND DURING WINTER INSTEAD OF CUTTING THEM DOWN TO PROVIDE WINTER HABITAT FOR BEES.**

XI. TOP 7 NATIVE PLANTS FOR BENEFICIAL INSECTS PER MICHIGAN STATE UNIVERSITY

- A. CANADA ANEMONE**
- B. GREAT BLUE LOBELIA**
- C. SPOTTED BEE BALM**
- D. YELLOW OR GRAY-HEADED CONEFLOWER**
- E. CUP PLANT**
- F. NEW ENGLAND ASTER**
- G. GOLDEN ALEXANDER**