

Working Draft

How to Hand Pollinate Wheat

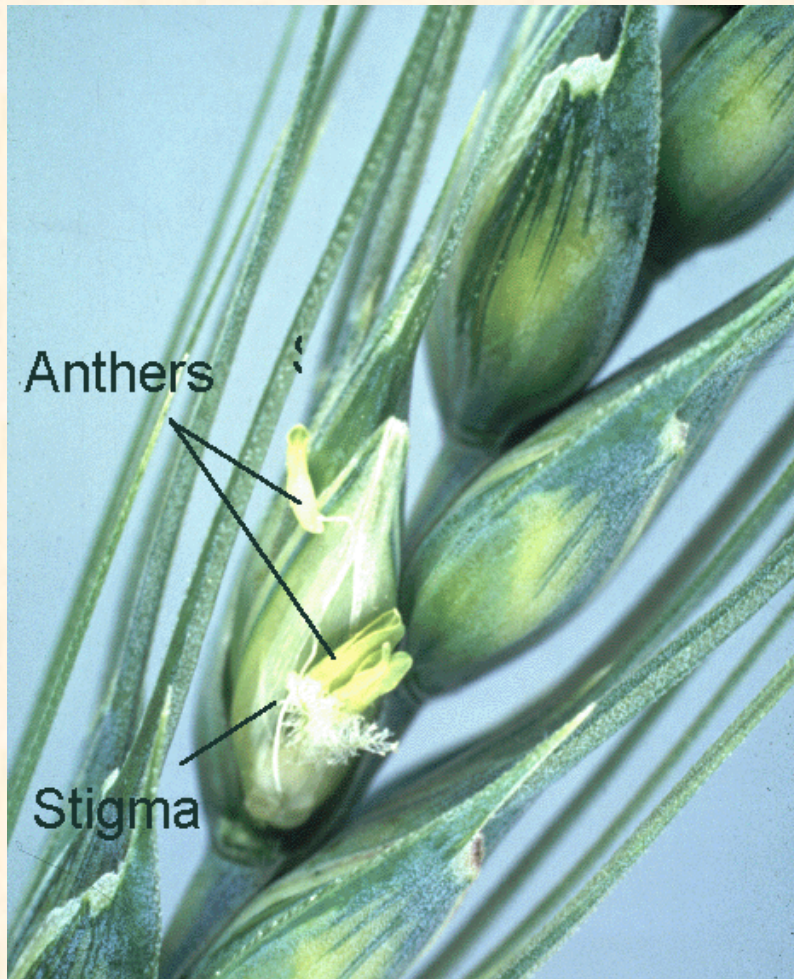
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Photos taken at the
greenhouse of Arik Hirshman, Agridera

Northeast Organic Wheat
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Wheat grows wild in the southern Fertile Crescent.
Like all foodcrops domesticated in this arid region,
wheat is self-pollinating to protect the pollen
from drying winds on its journey to the female ovule.





ag.ndsu.nodak.edu

Background

Fertilization

Pollen is produced on the male-anthers.

Fertilization occurs when pollen is transferred to a receptive stigma that carries the DNA to the female-ovule.



The stalk swells with an emerging wheat spike.



When the
'mother' spike is
well developed,
it is ready to be
prepared for
hand-pollination
by snipping off its
awns and anthers,
and bagging.



Snip off the awns on each spikelet.



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Each spikelet contains three florets.

Background



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Inside a mature floret are three anthers .
The delicate center stigma reaches up seeking the pollen.
The roundish soft creased base is the ovule that grows
into a kernel when it is fertilized.



Oh so carefully, pinch off the middle anther.
Gently slip around the leaflet on the two sides
and pinch off the side anthers.

bagged spike



exposed spike

Label a wax baggy
with the date.
Cover the exposed
mother-spike
with the baggy.
Seal with a paperclip.



The pollen on the father-spike is ready about a week later when a yellow anther pokes out in the center of the spike.



Select a father-spike from a plant with traits you want.
Snip snip snip off the awns.



Watch the pollen-laden anthers rise up,
seeking the female.



Insert the exposed male into the bagged female.
Shake in the pollen. Seal and date.

Background



Gene flow depends on the variety, climate and isolation distances.

Cross-pollination occurs naturally from 2% up to 9. % in warm dry weather, but is typically 3-5%.

Wheat pollen carried by wind is viable for a short period of time, from a few minutes to three hours - typically 10 minutes.