

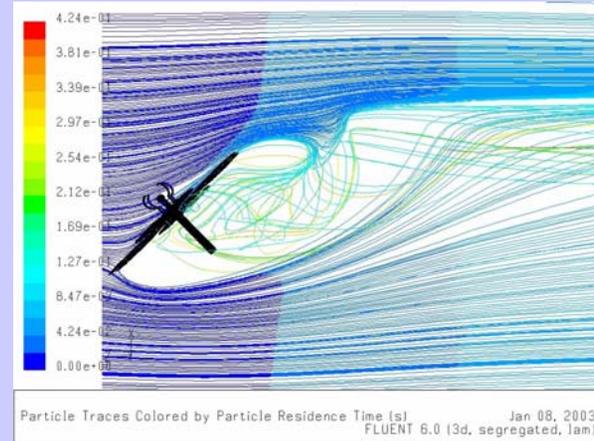
Dr James Cresswell

The logo of the University of Exeter, featuring the text "UNIVERSITY of EXETER" in a serif font, with "of" in a smaller, italicized font between "UNIVERSITY" and "EXETER". The text is enclosed in a thin black rectangular border.

UNIVERSITY
of
EXETER

SCHOOL OF BIOLOGICAL SCIENCES

Experimental pollination biology

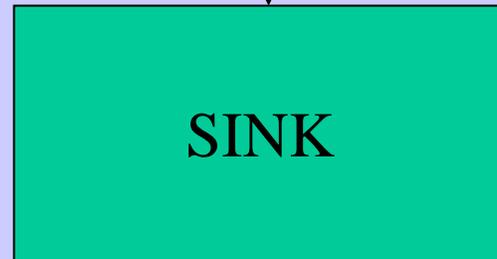
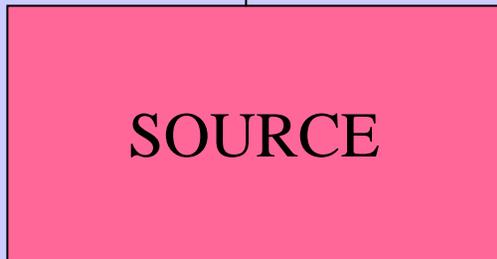


$$D_f \leq \frac{SC\Lambda(P_n - P_f) + D_n(C\Lambda + P_f\delta)}{C\Lambda + P_n\delta}$$

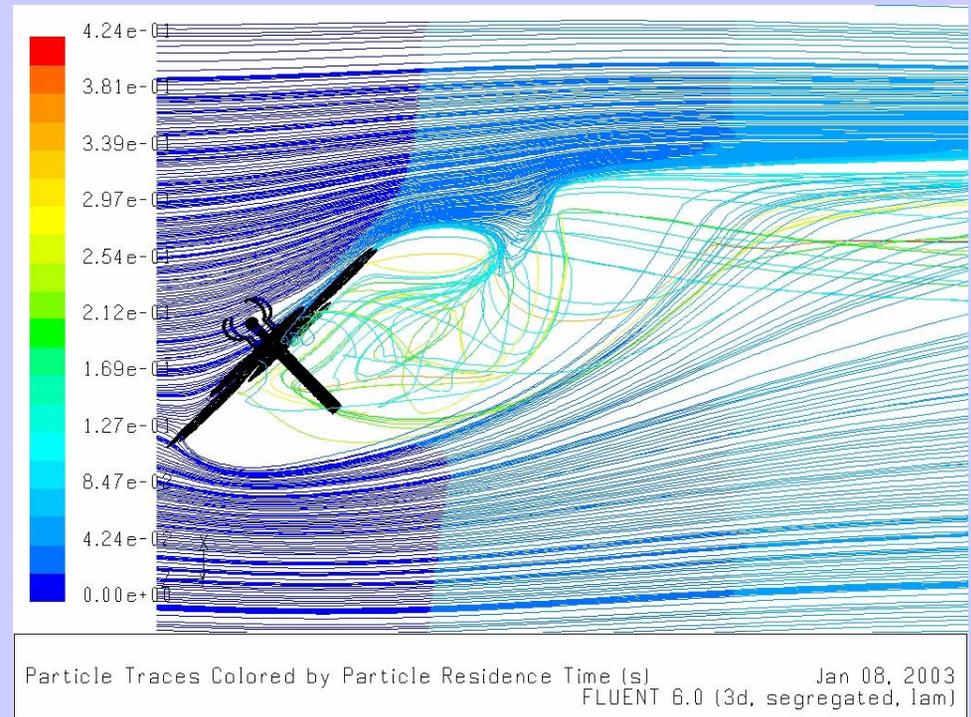
$$\xi = \frac{E\psi}{b}$$

Canola - oilseed rape

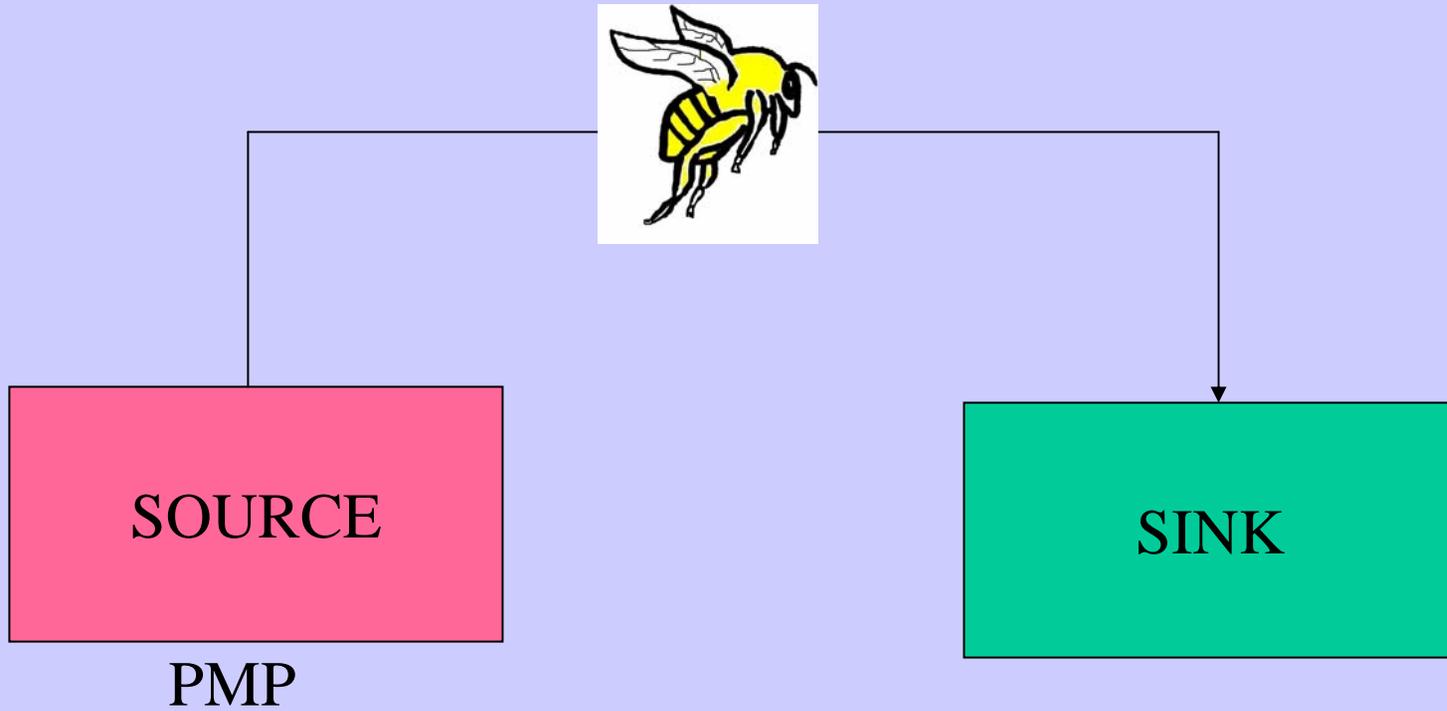




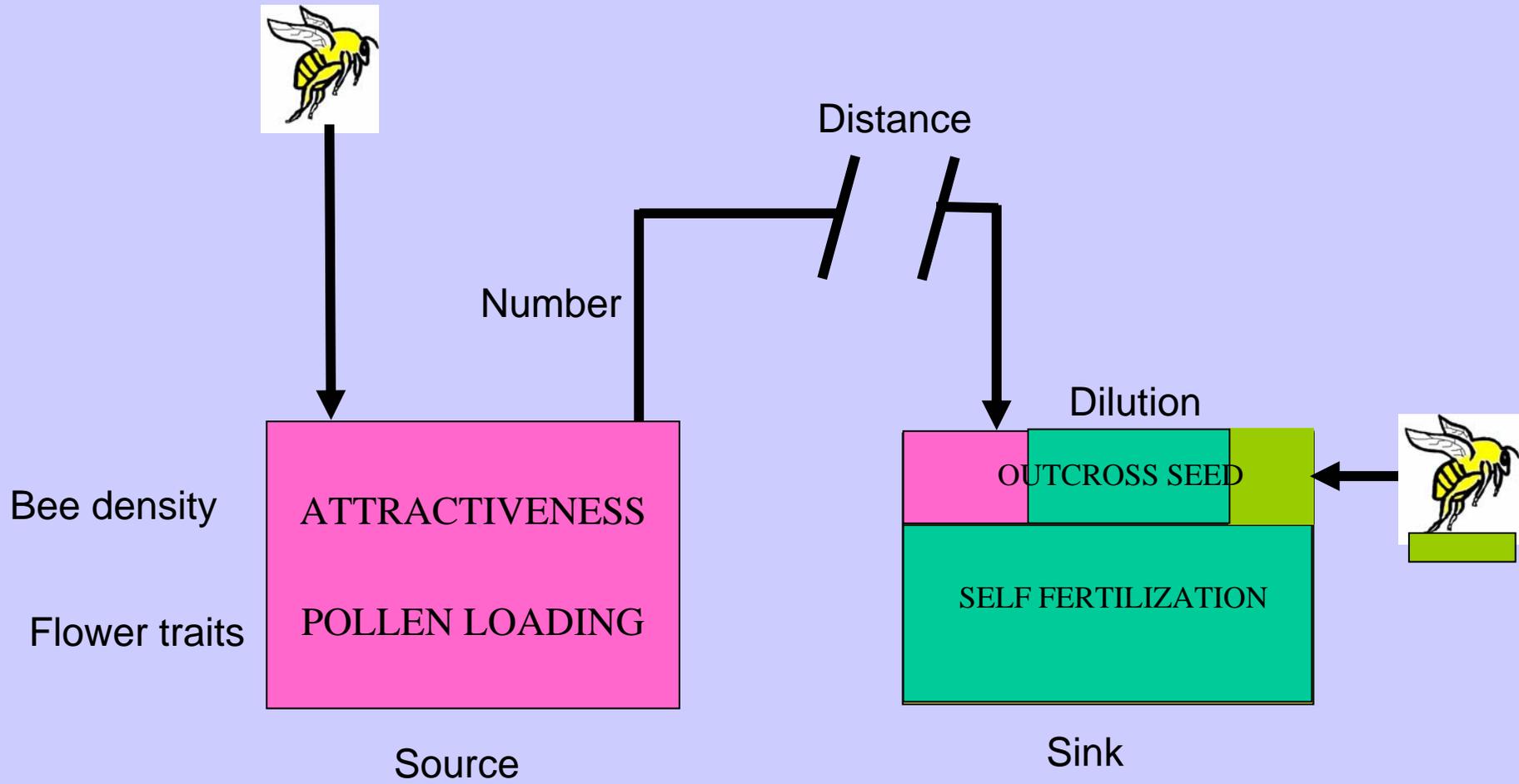
Simple insect-pollinated flowers

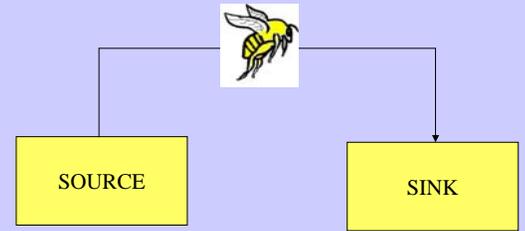


Cresswell et al. *Functional Ecol.* *in press*



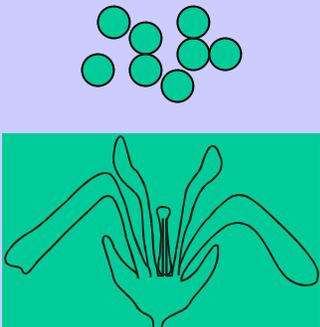
Gene dispersal process – aim to quantify



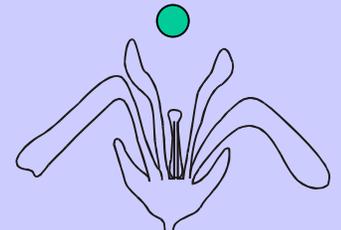
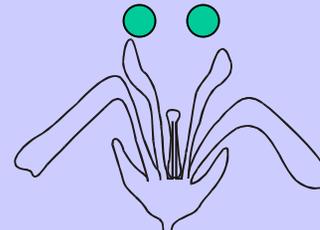
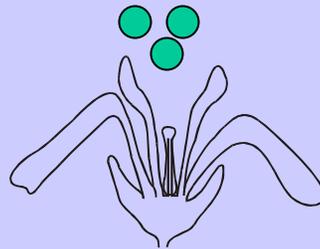


Bee-flower interaction diagram

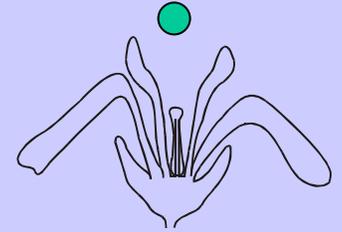
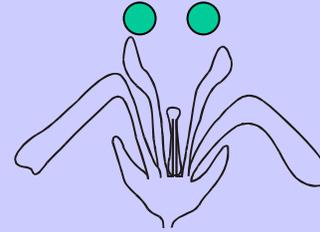
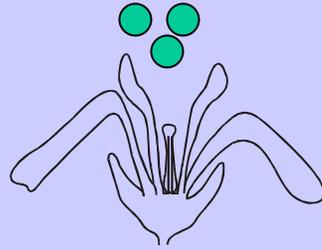
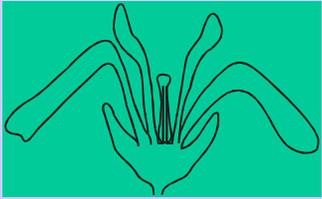
Depletion process



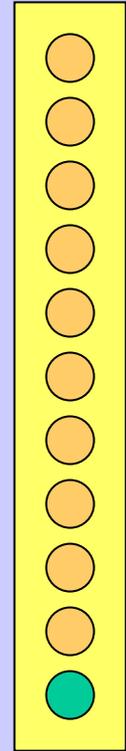
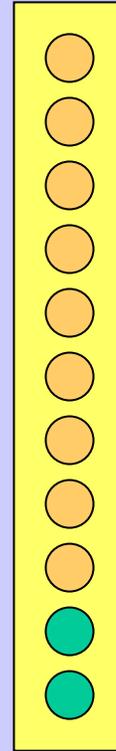
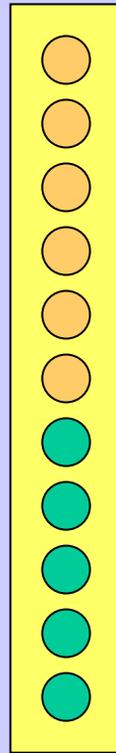
PMP

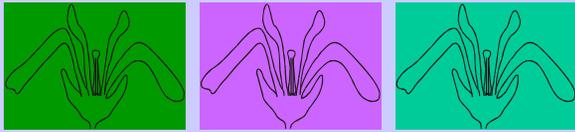


Pollen carryover

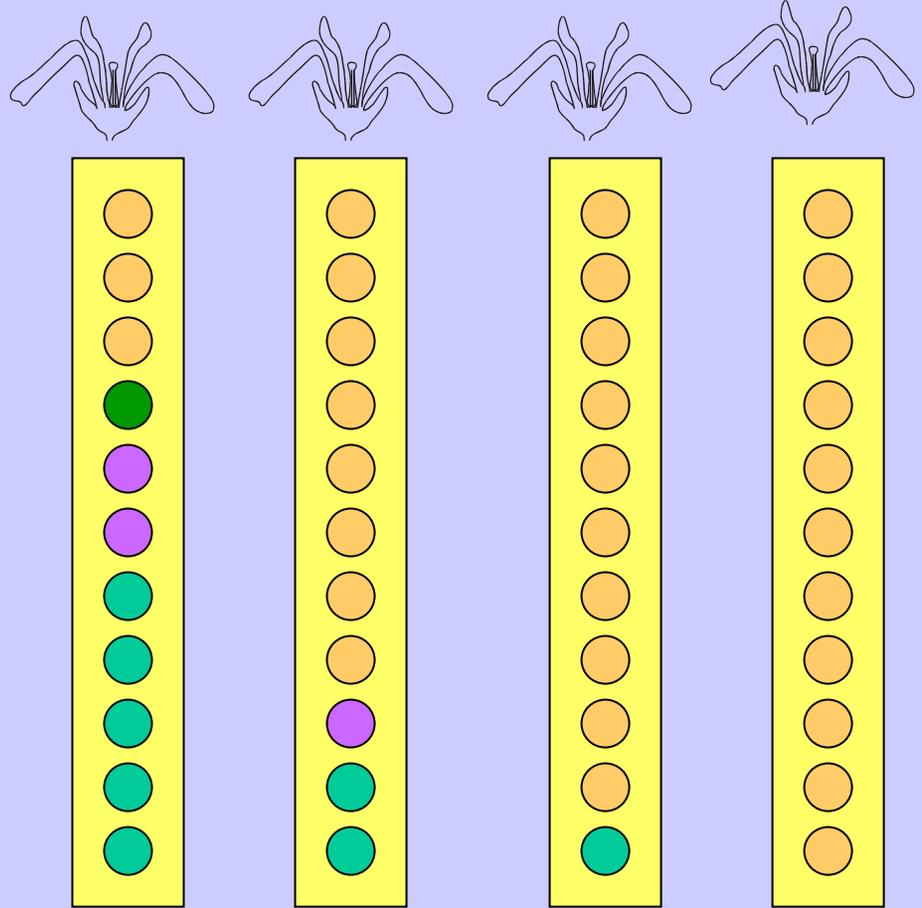


Dilution process

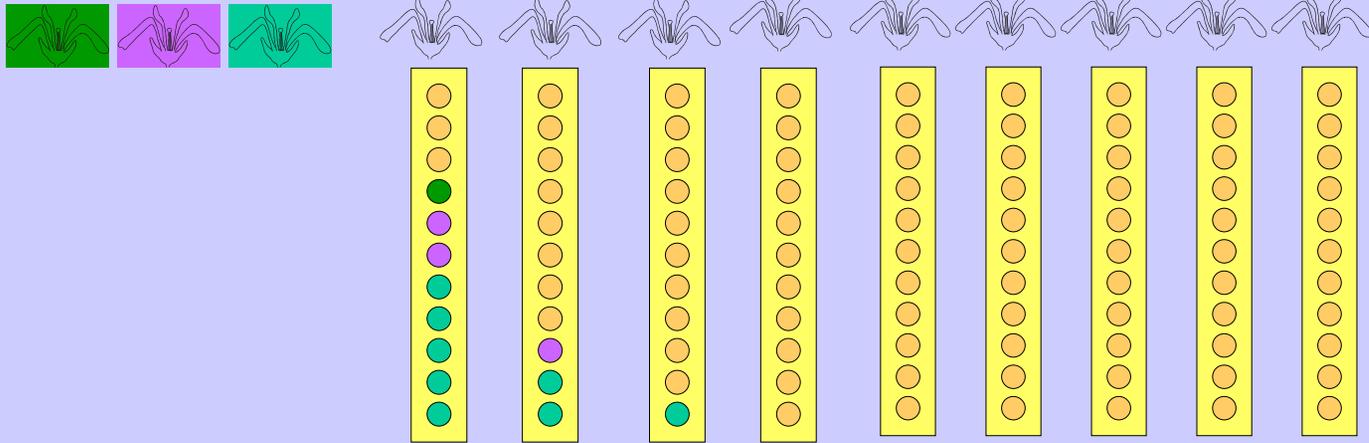
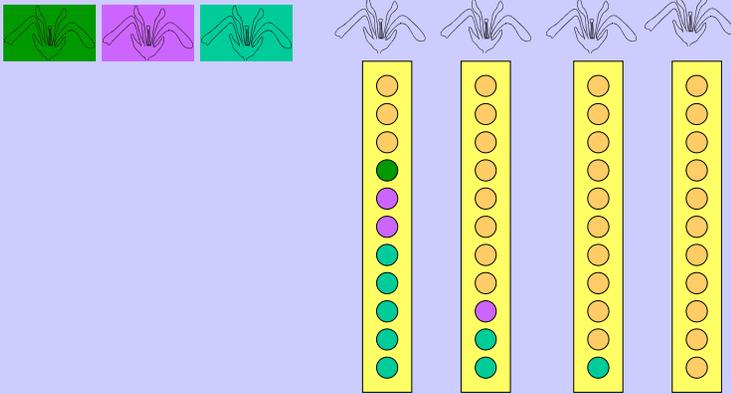




Source field

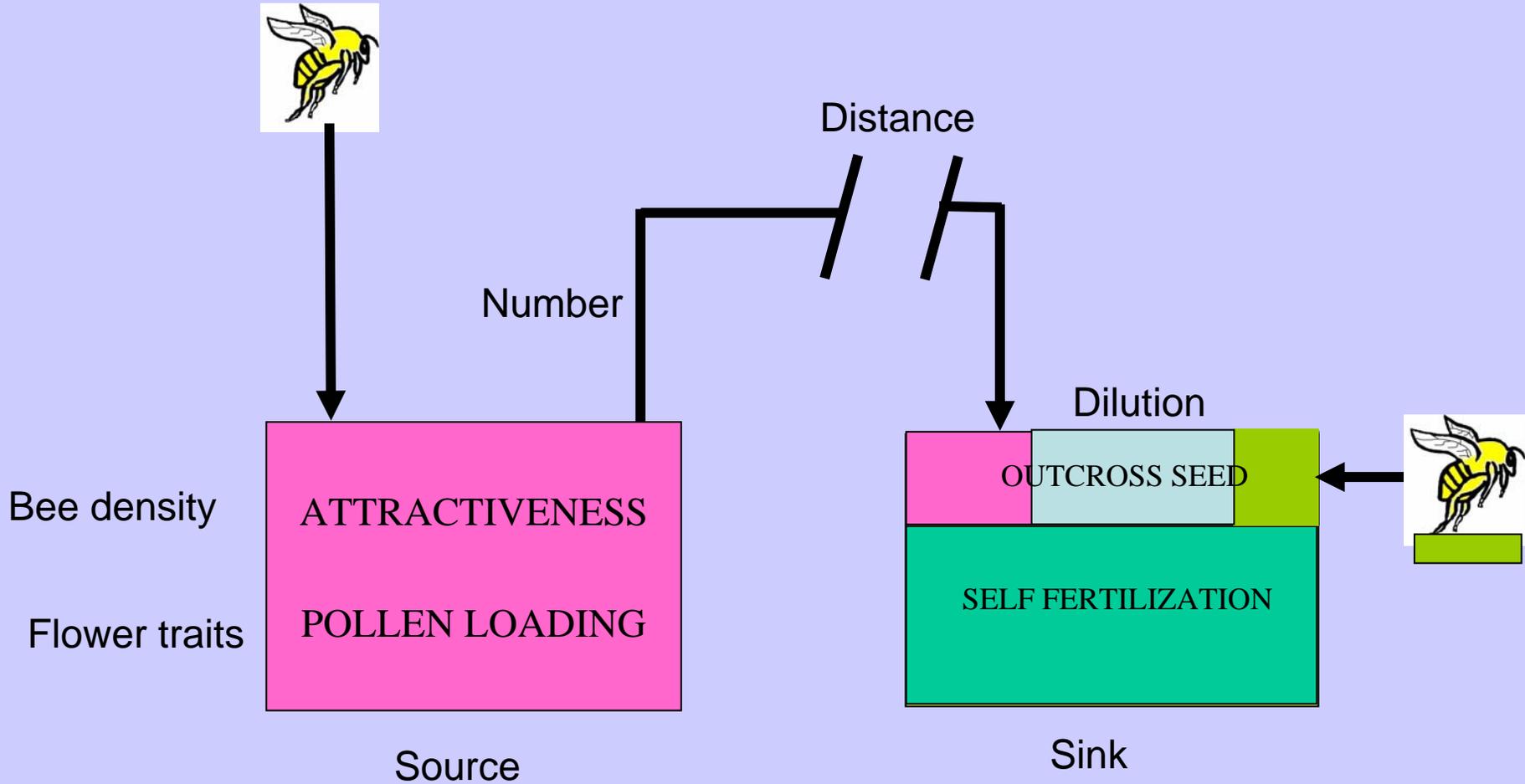


Portion diagram

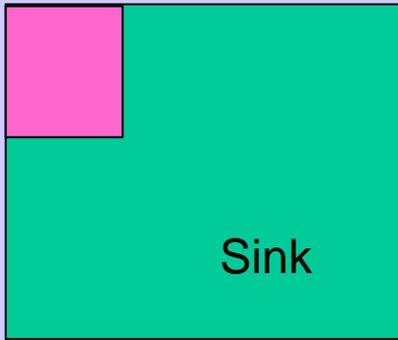


Effect of residence length

Gene dispersal process – aim to quantify

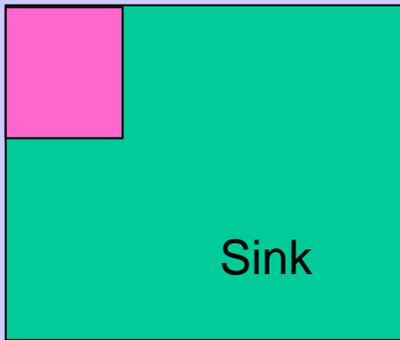


Gene dispersal schematic

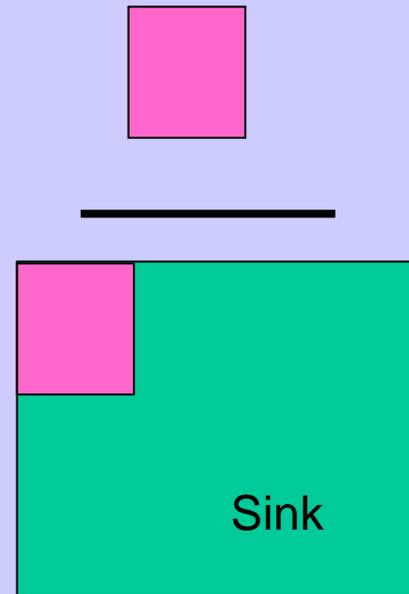


$$\xi = \frac{E \psi}{b}$$

Cresswell *et al.* 2002



$$\xi = \frac{E \psi}{b}$$

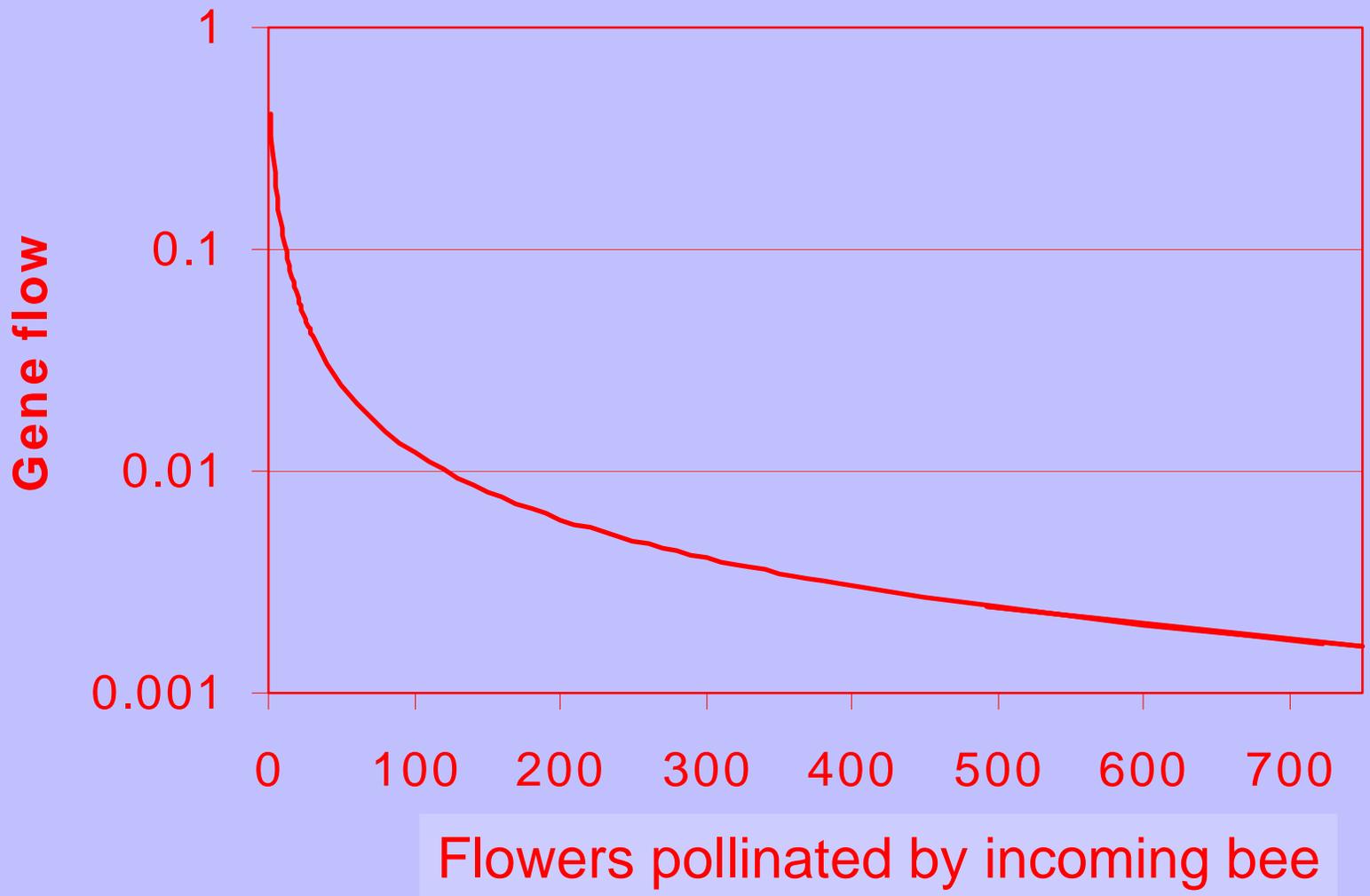


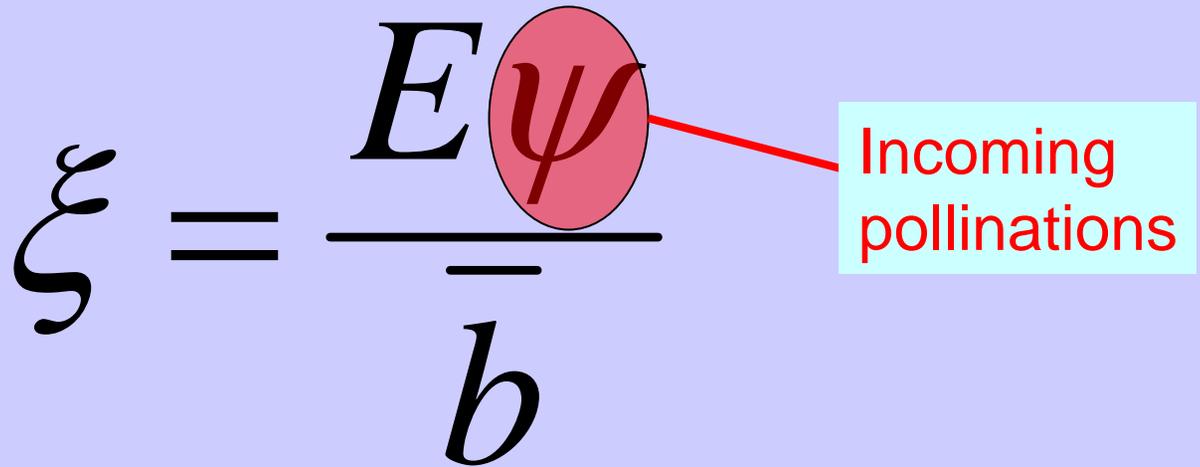
Likelihood of
patch-to-patch
transition

$$\xi = \frac{E\psi}{b}$$

Incoming
pollinations

Total pollinations
In patch



$$\xi = \frac{E\psi}{b}$$


Incoming pollinations

Psi: theoretically up to 10-15 (Cresswell 2003); realistically 1-3

E: worst case = 1

What is b?

E-psi-b focus on psi

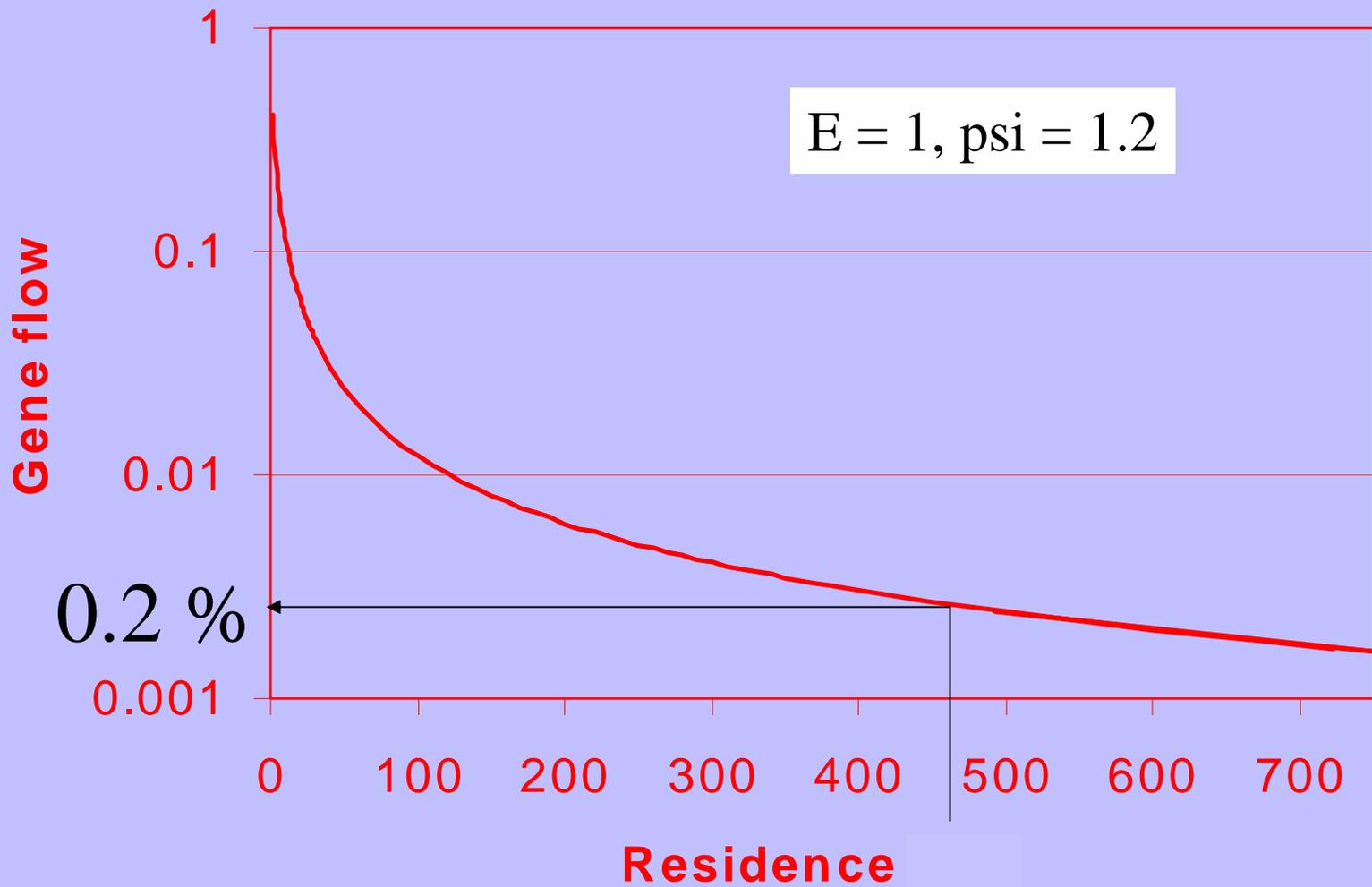
$$\xi = \frac{E \psi}{b}$$

Total pollinations
In patch

E-psi-b: focus on b



Field of oilseed rape - Canada



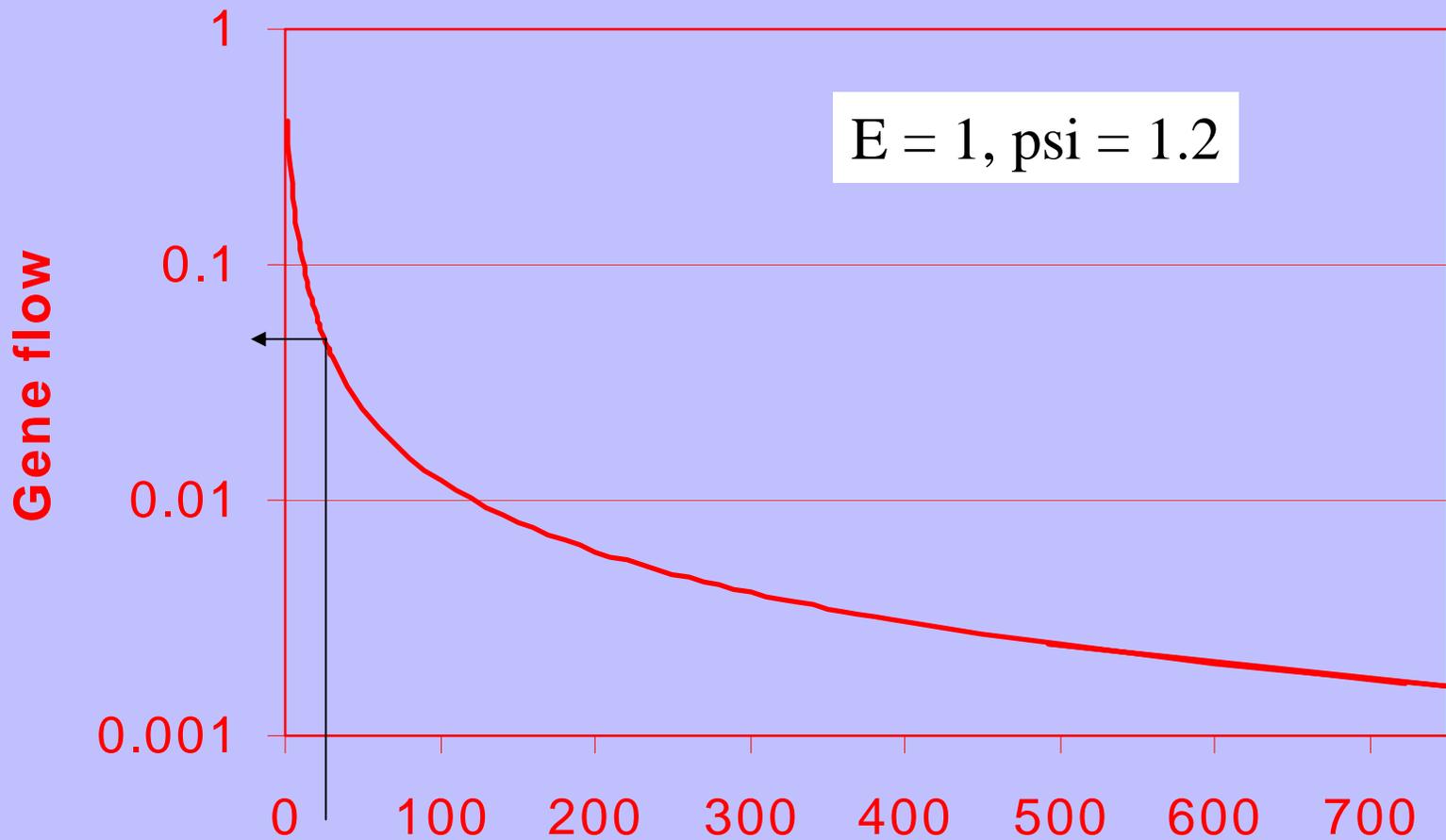
Canola fields have low gene flow by nature – strong dilution



Rothamsted
patch
experiment

Juliet Osborne

Rothamsted patches

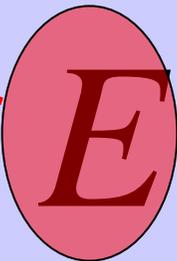


Flowers pollinated by incoming bee

Canola patches have high gene flow by nature – weak dilution

Beyond the worst case....

Likelihood of
patch-to-patch
transition


$$\xi = \frac{E\psi}{b}$$

E-psi-b focus on E



NEST

$$D_f \leq \frac{SC\Lambda(P_n - P_f) + D_n(C\Lambda + P_f\delta)}{C\Lambda + P_n\delta}$$



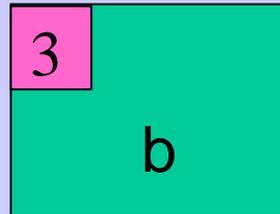
Economics of E

$$\xi = \frac{E\psi}{b}$$



Set $E = 1$, $\psi = 3$; just get b

$$\frac{3}{b}$$



E-psi-b and safflower



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