Supporting Document S1

Calculation of the total area of a multi-crop (MC) plot

Let us take the land area of design A (**Fig. 1**). Let us first calculate the area occupied by brinjal (BR) plants:

All BR saplings, like all other species, are planted in a single column, 3 times over (col. 1, 8 and 15). The number of BR plants in each of these 3 columns is 21 (1 in each row), and the gaps on all 4 sides of each BR plant is G_{BR} = 40 cm. We leave an equal amount of gap (G_{BR}) beyond each border row. Therefore, the area in each column is $2G_{BR}^2$ (R+1),

and for the 3 repeated columns of BR in the plot,

$$2\, G_{BR}^2 (R+1)\, C_{BR} \qquad \text{(Eq. S1)},$$

which translates to 2 x (80 cm x 80 cm) (21 + 1 rows) x 3 $m^{2,}$, where C_{BR} is the number of columns bearing BR in each row, which is uniformly designed to be 3.

However, the spacing (G_i = 25 cm) on all sides of each non-BR plant in each row needs to be less by 1 for each column of crop *i*, because on one side this space is subsumed in G_{BR} = 40 cm for each neighbouring BR plant. We also leave an extra space of 25 cm on the last (21[st]) column. Therefore, the total area planted to all non-BR crops S (= 6) is :

$$\sum_{i=1}^{6} A_i = (S-1)\, G_i^2 C_i (R+1) + G_i^2 (R+1) = G_i^2 (R+1)[1 + C_i (S-1)] \qquad \text{(Eq. S2)}$$

Combining Eq. S1 and S2, and because $C_{BR} = C_{i \neq BR} = 3$, we obtain the total area sown to all (BR and 6 non-BR) crops :

$$A_{BR} + \sum_{i=1}^{6} A_{i(i \neq BR)} = 2\, G_{BR}^2 C_i (R+1) + G_i^2 (R+1)[1 + C_i (S-1)] \qquad \text{(Eq. S3)}$$

Defining $X = 2C_i$ and $Y = [1 + C_i\ (S-1)]$, the eqn. S3 can be rewritten as a general equation

$$\sum_{i=1}^{7} A_i = G_i^2 (R+1)[X + Y] \qquad \text{(Eq. S4)}$$

where $X = 2C_i$; $Y = 0$; and $G_i = 40$ cm for i = BR
$X = 0$; $Y = [1 + C_i\ (S-1)]$; and $G_i = 25$ cm for $i \neq$ BR

Because all designs of MC plots are planted with the same number of crop species, and identical number of plants (assuming zero mortality) with the same crop-specific plant-to-plant spacing, Eq. S4 is applicable to all designs of MC plots. In cases of mortality of crop *i* in a plot, the actual area covered by the surviving individuals (N_i) is $AA_i = A_i N_i / C_i R$, as described in Eq. 1 in the main text.