

GENETICS PROBLEMS ( B.Sc MAIN BOTANY, ZOOLOGY & PLANT SCIENCE )

MONOHYBRID CROSS.

How to work out a problem?

1. Read the problem carefully two or three times.
2. Determine which character is dominant and which one is recessive.
3. Use capital letter for dominant character and small letter for recessive character.
4. Plot the data carefully on the paper.
5. Determine the genotype of the parents. Genotype can be shown as A--B—for dominant character and aabb for recessive character respectively.
6. Determine all possible types of gametes by each parent.
7. Work out the cross carefully.
8. Read the problem again and answer to the exact question asked to do so.

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**Problem No.1**

A red-fruited tomato plant is crossed to a yellow-fruited one produce 173 offspring, 84 of which were yellow and 89 red. Determine the genotype of the parents.

Red fruit colour 'R' is dominant over yellow 'r'.

Answer:

Red fruit – RR or Rr

Yellow fruit –rr

Red is completely dominant over yellow.

In the given data above the offspring segregate in an approximate ratio of 1:1. So it is a case of monohybrid test cross. Test cross is a cross of a hybrid back with its recessive parent. So the genotype of the parents are - Red –Rr; Yellow – rr.

$$\begin{array}{c} Rr \times rr \\ \text{Gametes- (R), (r) \quad (r)} \\ \text{Offspring- R r (Red 89) \& r r (yellow 84) Ratio – 1:1} \end{array}$$

**Problem No. 2**

In man brown eye colour 'B' is dominant over blue eye colour 'b'. A brown-eyed man marries a brown-eyed woman. Their first child is a blue eyed one. Determine the genotype of the parents. Give the reason of it.

Answer :

Brown eyes- BB, Bb

Blue eyes – bb

In order to produce a blue-eyed child the genotype of the parents should be heterozygous for the character. So the genotype of the man – Bb and the genotype of the woman is- Bb.