Solutions

Each answer shows the steps, then the **result**.

2.1

- the field can be sprayed with herbicide to kill weeds without harming the crop, so the crop has less competition and a higher yield

2.2

- it makes a protein that kills the insect pests that eat it

2.3

- an organism whose DNA has been altered by inserting a gene (often from another species)

2.4

- the fish grow to market size faster, so they can be sold sooner

3.1 B

- GM salmon are engineered to grow to size faster

3.2 B

- The resistance gene could spread to wild plants

3.3

(a)

- the cotton makes a protein that kills insect pests; fewer pests eat the crop, so more survives – a higher yield

(b)

- environmental, e.g. harm to non-pest insects / gene spread to wild plants; social, e.g. a few companies controlling the seed supply / cost to small farmers

3.4

- they may worry the food is not proven safe to eat, or have ethical objections to altering organisms' genes

3.5

(a)

- the crop is not harmed by the herbicide, so it can be sprayed at any stage
- weeds can be killed throughout growth with one broad-spectrum herbicide, so heavier use is possible

(b)

- the gene could pass to wild relatives by cross-pollination
- producing herbicide-resistant "superweeds" that are hard to control

3.6

- the cost of buying seed every year may be too high for poor farmers, increasing debt
- farmers become dependent on large companies and cannot save their own seed