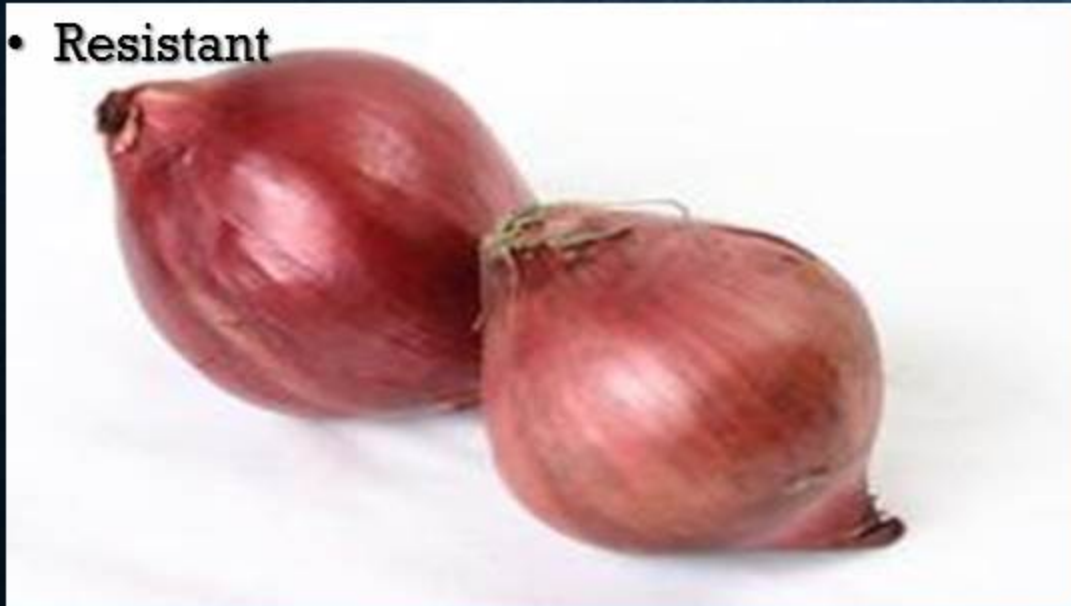


CONSTITUTIVE BIOCHEMICAL DEFENSE

- In contrast to red and yellow onions, white onions do not contain significant quantities of certain phenolic chemicals (one is catechol). If present, these phenolics confer resistance to onion smudge disease (*Colletotrichum circinanas*).

• Resistant



• Susceptible



CONSTITUTIVE BIOCHEMICAL DEFENSE

Inhibitors released by the plant in its environment:

- Fungitoxic exudates:
 - of tomato and sugarbeet inhibit germination of *Botrytis* and *Cercospora*;
 - oil capric acid on elm seed toxic to *Ceratocystis ulmi* spores
 - Phenolics: red scaled onion against smudge, *Colletotrichum circinans*

Inhibitors present in plant cells:

- Stored in vacuoles, lysogenous glands, heart wood periderm of plants
 - Phenolics: (e.g. in onions, catechol and protocatechoic acid)
 - Saponins: most of these compounds inhibit hydrolytic enzymes produced by pathogen (e.g. tomatin in tomato, avenacin in oats, e.g. pectolytic enzymes etc.
 - Some plants also contains hydrolytic enzymes e.g. glucanases, chitinases etc