Pearl millet (bajra)
(Pennisetum glaucum (L.) R. Br.)

1.Most of the pearl millet area is grown with hybrids while the varieties are preferred in drought prone ecologies. The list of latest hybrids and varieties of pearl millet is given below.

S.No.	Region/ State	Crop season	Hybrid	Variety
1.	**Rajasthan**	*Kharif*	BHB-1202 (Bikaner Hybrid Bajra-1202), RHB 223 (MH 1998), HHB 299 (MH 2076), AHB 1200, MP 535 (Pusa Composite 701), MP 7872, MP 7792,HHB 272 (MH1837), HHB 67, MPMH-21, MPMH 17, KBH 108, GHB 905, 86M89, 86M86, 86M66, Kaveri Super Boss, Bio 448, RHB-173	MBC 2, PC 443, JBV 3, PC 383, ICMV 221, Raj 171
		Summer	Nandi 72, Nandi 70, 86M64	
		Kharif – arid parts	HHB 234, Bio 70, HHB-226, RHB-177	CZP 9802
2.	**Gujarat**	*Kharif*	RHB 223 (MH 1998), HHB 299 (MH 2076), AHB 1200, MP 535 (Pusa Composite 701) , MP 7872, MP 7792, HHB 272 (MH1837), HHB 67, MPMH-21, MPMH 17, KBH 108, GHB 905, 86M89, Kaveri Super Boss, Bio 448, 86M86, 86M66, RHB-173	MBC 2, PC 443, JBV 3, PC 383, ICMV 221, Raj 171
		Summer	Nandi 70, Nandi 72, 86M64	
		Kharif – arid parts	HHB 234, Bio 70, HHB-226, RHB-177	CZP 9802
3.	**Haryana**	*Kharif*	RHB 223 (MH 1998), HHB 299 (MH 2076), AHB 1200, MP 535 (Pusa Composite 701) MP 7872, MP 7792, HHB 272 (MH1837), HHB 67, MPMH-21, MPMH 17, KBH 108, GHB 905, 86M89, Kaveri Super Boss, Bio 448, 86M86, 86M66, RHB-173,	MBC 2, PC 443, HC 20, JBV 3, PC 383, HC 10, ICMV 221, Raj 171

		Kharif – arid parts	HHB 234, Bio 70, HHB-226, RHB-177	CZP 9802
4.	**Punjab**	*Kharif*	HHB 299 (MH 2076), AHB 1200, MP 535 (Pusa Composite 701) MP 7872, MP 7792, PHB 2884, KBH 108, GHB 905, 86M89, MPMH 17, Kaveri Super Boss, Bio 448, 86M86, 86M66, RHB-173	PCB 164, ICMV 221, Raj 171
5.	**Delhi**	*Kharif*	Pusa 1201 (MH 1849), HHB 299 (MH 2076), AHB 1200, MP 535 (Pusa Composite 701) MP 7872, MP 7792, KBH 108, GHB 905, 86M89, MPMH 17, Kaveri Super Boss, Bio 448, 86M86, 86M66, RHB-173	JBV 3, PC 383, ICMV 221, Raj 171
6.	**Uttar Pradesh**	*Kharif*	MP 535 (Pusa Composite 701) MP 7872, MP 7792, KBH 108, GHB 905, 86M89, MPMH 17, Kaveri Super Boss, Bio 448, 86M86, 86M66, RHB-173	JBV 3, PC 383, ICMV 221, Raj 171
7.	**Madhya Pradesh**	*Kharif*	MP 535 (Pusa Composite 701), MP 7872, MP 7792, KBH 108, GHB 905, 86M89, MPMH 17, Kaveri Super Boss, Bio 448, 86M86, 86M66, RHB-173	JBV 4, JBV 3, PC 383, ICMV 221, Raj 171
8.	**Maharashtra**	*Kharif*	HHB 299 (MH 2076), AHB 1200, Phule Aadishakti (DHBH 9071), Kaveri Super Boss, Pratap, PKV Raj, Shine, MP 7792, 86M86, PAC 909, 86M64, 86M53	ABPC4-3, PC 612, Parbhani Sampada, Samrudhi, ICMV 221, Raj 171, ICMV 155
		Summer	Nandi 72, Nandi 70, 86M64	-
9.	**Tamilnadu**	*Kharif*	HHB 299 (MH 2076), AHB 1200, CO 10, Co 9, Kaveri Super Boss, Pratap, Shine, MP 7792, 86M86, 86M64, 86M53, PAC 909.	PC 612, CoCu 9, Samrudhi, ICMV 221, Raj 171, ICMV 155
		Summer	Nandi 72, Nandi 70, 86M64	-
10.	**Andhra Pradesh**	*Kharif*	AHB 1200, Kaveri Super Boss, Pratap, Shine, MP 7792, 86M86, PAC 909, 86M64, 86M53 PC 612, Samrudhi, ICMV	221, Raj 171, ICMV 155, Ananta
11.	**Karnataka**	*Kharif*	Kaveri Super Boss, Pratap, Shine, MP 7792, PAC 909, 86M86, 86M64, 86M53 PC 612, Samrudhi, ICMV	221, Raj 171, ICMV 155


These values are approximate and can vary based on specific varieties, growing conditions, and agricultural practices. For precise recommendations and information, it's best to consult with local agricultural experts or extension services.

2.Maturity Period: Pearl millet (Pennisetum glaucum) typically takes around 60-90 days to mature from the time of sowing, depending on factors like climate, soil conditions, and cultivation practices.

3.Number of Tillers: Pearl millet plants can have multiple tillers per plant, with the exact number depending on the variety and growing conditions.

4.Seed Rate per Hectare: The recommended seed rate for pearl millet cultivation is approximately 10-15 kg per hectare. However, this can vary based on factors like soil fertility, planting method, and local agricultural practices.

5.Yield per Hectare: The yield of pearl millet can vary widely depending on factors like soil quality, climate, and cultivation practices. On average, under good growing conditions, it can yield around 800-1000 kg per hectare.

6.Size and Colour of Grains: Pearl millet grains are relatively large compared to other millets. They are typically round and can vary in color from white, yellow, brown, to grey, depending on the variety.

7.Length of Plant: Pearl millet plants can vary in height from 2 to 4 meters (6.5 to 13 feet), although it can vary depending on the specific variety and growing conditions.

8.Nutritional Value: Pearl millet is a nutritious cereal grain. It is a good source of essential nutrients like carbohydrates, dietary fiber, protein, and various vitamins and minerals. It is gluten-free and rich in antioxidants.

9.Germination Percentage: The germination percentage of pearl millet seeds can vary based on factors like seed quality, storage conditions, and age of the seeds. Under optimal conditions, the germination rate can be quite high, often above 80%.

10.Major insect-pests

Insect pests are considered to be relatively less important in most of the pearl millet growing areas in India. The most important insect pests of pearl millet are white grub, shoot fly and grey weevil.

White grub

A common pest in Gujarat and Rajasthan. The grubs attack the root of the growing seedlings and cause complete withering of the plants. Patchy gaps are formed due to death of plants which result in poor or uneven plant stand. Grubs cause maximum damage during July-August. The adults emerge from May to July with the pre-monsoon/monsoon showers and feed on pearl millet flower and grains in the milky stage. The extent of damage ranged from 5-25% in Rajasthan.

Control

Inter-cropping with sunflower and pigeon pea reduces the incidence of white grub. Collect and destroy the adult beetles immediately after first showers when they visit neem/ Acacia trees for mating.

Furrow application of Carbofuran 3G @ 12 kg/ha with pearl millet seed and application at the time of sowing is effective. Soil drenching of Imidacloprid 17.8 SL @ 300 ml/ ha or Chloropyriphos 20 EC or Quinolphos 25 EC @ 4 lit/ha with irrigation in standing crop around 3 weeks of emergence of beetle or insecticide mixed soil can be used in rainfed crop provided it rains soon after application around three weeks later.


White grub


Adult beetle


Damaged saeedlings


Grass hoppers

Shoot fly

It is a common pest on pearl millet in Gujarat and Tamilnadu. Larvae cut the growing point causing dead-heart during the seedling stage whereas in advance stage, they feed on ear heads and cut down panicles. Infestation is more on late sown crop.

Control

To control the shoot fly, the crop should be sown with the onset of the monsoon or improved within 10-15 days of first shower of monsoon. Recommended staggered sowing to contain the buildup of shoot fly population is to be adopted. Transplanting is suggested for late sown crop. In case direct seeding, a seed rate of 4 kg per ha is recommended and the affected seedlings are thinned within 15 days after sowing. In case of heavy incidence of shoot fly in endemic areas, spray the crop with 0.07% Cypermethrin at 10 and 20 days after germination and in places where water is a problem, 4% dust of Cypermethrin can be used.

Grass hoppers

Eggs are laid in the soil 75-200 mm deep; hoppers and adults feeds on foliage, at times causes severe defoliation. The adults are short winged and can fly short distances only.

Control

Weed free cultivation is advisable. After harvest, expose the egg through soil deep summer ploughing is recommended. Scrapping of bunds and clean cultivation should be done. Dust the crop with 4% Cypermethrin or Fenvalerate dust @ 25 kg/ha or spray the crop with 0.07% of Cypermethrin can be done.

Termites

A social insect that live underground in colonies, attack young seedlings as well as grown up plants. Infested plants wither and ultimately die.

Termite damaged crop

Control

Deep ploughing after harvesting of the crop, followed by collection of stubbles/plant residue and burning thereof. Use well decomposed FYM. Irrigate the crop timely. For managing termites where the pest is of regular occurrence, the soil should be mixed with Chloropyriphos 5D@ 35 kg/ha at the time of sowing. When the incidence of pest is noticed in standing crop dilute Chloropyriphos 20EC in 5 litre of water and mix it with 50 kg of soil and broadcast evenly in 1.0 ha followed by light irrigation.

Grey weevil

It is a polyphagous insect. Adult beetles feed on green leaves, cause serious damage to the seedlings.

Control

To control this dusting of Quinalphos 1.5% or Methyl Parathion 2% or Malathion 5% @ 25 kg/ha is required on appearance of the pest.

Grey weevil

Earhead bug

Shrivelled grains

Earhead bug

A common pest in southern parts of the country. Nymphs and adult bugs suck the sap from tender grains at the milk stage, making them chaffy/ shriveled.

Control

Early planting reduces the infestation of the pest, application of Carbaryl 50 WP @ 3 kg/ liter of water/ha.

Stem borers

A nocturnal moth, dirty brownish in colour. Caterpillars feed on foliage and bore into the stem causing dead heart, also tunnel the stem and bore into ear heads.

Control

Carbofuran 3G granules may be applied in the whorls @ 8-12 kg a.i./ha or the entire field can be sprayed with Metasystox 25 EC @2 ml /liter.

Major diseases

Although many diseases have been reported in pearl millet in India, but only few are important. These are downy mildew, smut, rust and blast. These diseases directly reduce grain yield by affecting grain formation. In addition, ergot can also reduce grain quality. Use of resistant cultivars is the most cost-effective method of the control of pearl millet diseases.


Downy mildew on leaf


Rust


Downy mildew on earhead


Smut infection

Downy mildew

Systemic symptoms as chlorosis generally appear on the second leaf and all the subsequent leaves and panicles of infected plant show symptoms. Leaf symptoms begin as chlorosis at the base of the leaf lamina and successively upper leaves show a progression of greater leaf area coverage by the symptoms. Infected chlorotic area produces huge number of asexual spores, generally on the lower surface, giving the leave a 'downy' appearance. Systemically infected plants remain stunted either do not produce panicle or produce malformed panicles.

Management

Diseases can be controlled by integrating methods of chemical or biological control, and cultural practices. It is recommended to use of resistant cultivars, rotate hybrids with variety alternately to keep soil inoculum under control. Seed treatment with Apron 35 SD @ 6g/kg seed can be done. Seed treatment with Bacillus pumulis (INR7) is recommended. If infection exceeds 2-5%, foliar spray of Ridomil 25 WP (100 ppm) after 21 days of sowing can be done.

Rust

Rust symptoms first appear on lower leaves as typical pustules containing reddish brown powder. Symptoms can occur on both upper and lower surface of the leaves but mostly on upper surface and also on stem. Highly susceptible cultivars develop large pustules on leaf blades and sheaths.

Management

To control this problem use of resistant hybrids/varieties is advised. Sow the crop with onset of monsoon. Destroy collateral hosts like, crabgrass and Guinea grass, buffalo grass on the field bunds. Spraying of Dithane M 45 @ 0.2% thrice commencing from one month old crop onwards at 10 days intervals.

Smut

Smut disease is of greater importance in India especially, with the adaptation of hybrids. The disease is more severe in CMS-based single-cross hybrids than in open-pollinated varieties. The infected florets produce sori that are larger than grains and appear as oval to conical, which are

initially bright green but later turn brown to black. The disease occurs during the month of September/ October. Early

sown crop generally escapes from the smut infection.

Management

It can be managed by using of resistant cultivars. Seed dressing with Thiram 75 @ 3 g/kg is recommended. Remove smutted ears from the field covering in a plastic bag should be done.

Ergot

The disease is easily identified as a honeydew substance of creamy to light pinkish ooze out of the infected florets which contains numerous conidia. Within two weeks, these droplets dry out as hard dark black structures larger than seeds, protruding out from the florets in place of grain, which are called sclerotia. The disease occurrence and spread is highly influenced by weather conditions during the flowering time.

Management

Mechanical removal of sclerotia from seed and washing of seed in 2% salt water. Adjust sowing dates so that ear emergence does not coincide with more rainy days. Plough the field soon after harvest so that ergot is buried deep. Three foliar application of Thiram 0.2% starting from 50% flowering reduces incidence.

Blast

The symptoms appear as distinct large, indefinite, water soaked, spindle shaped, grey centred and purple grey horizon with yellow margin, resulting in extensive chlorosis and premature drying of young leaves.

Management

Clean cultivation and removal of crop residues is must. Foliar spray with Carbendazim @ 0.1% a.i. is recommended if leaf symptoms are there.

Blast symptoms on leaves