

Annexure III Pests and diseases of Crops

District: Kangra									
1	2	3	4	5	6	7	8	9	10
Host	Insect/ animal	Scientific name	Local name	Habitat	Time/ season of attack	Management mechanism	Associate d TK	Other details	Community knowledge holder
Maize	Black cutworm	<i>Agrotis ipsilon</i>	Katua Keet/ Toka	<ul style="list-style-type: none"> • Found during day time hiding in soil close to stems. • Larva cut the seedling plants and feed. 	April-June & Oct-Nov	<ul style="list-style-type: none"> • Hand picking and destruction of larvae. • Apply chlorpyrifos 20 EC @ 2 litres/ ha. 	-	-	-
	Common cutworm	<i>A. segetum</i>	Katua Keet/ Toka	<ul style="list-style-type: none"> • Found during day time hiding in soil close to stems. • Larva cut the seedling plants and feed. 	April-June & Oct-Nov	<ul style="list-style-type: none"> • Hand picking and destruction of larvae. • Apply chlorpyrifos 20 EC @ 2 litres/ ha. 	-	-	-
	White grubs	<i>Holotrichia longipennis</i> and <i>Lepidiota stigma</i>	Safed Gidar	<ul style="list-style-type: none"> • Soil dwelling grubs are present in soil at a depth of 5-20 cm. • Grubs feed on underground stem and roots tubers. 	June-Oct	<ul style="list-style-type: none"> • Plough the fields to expose grubs to predators. • chlorpyrifos 20 EC @ 2 litres/ ha after mixing with 20-25 kg of sand. 	-	-	-
	Termites	<i>Microtermes obesi</i> <i>Odontotermes obesus</i>	Deemak	<ul style="list-style-type: none"> • Build tall (2-4 m), cylindrical mounds or termitarium. • workers damage roots. 	Regular	<ul style="list-style-type: none"> • Locating and destroying termite nests. • Use well decomposed FYM. • Applying chlorpyrifos 20 EC @ 2 litres/ ha after mixing with 20-25 kg of sand. 	-	-	-
	Maize Stem Borer	<i>Chilo partellus</i>	Tane ki sundi	<ul style="list-style-type: none"> • larvae first feed on the leaves, making a few shot holes. 	July	<ul style="list-style-type: none"> • Remove the dead-hearts and infested plants. 	-	-	-

				<ul style="list-style-type: none"> • Central shoot withers and leading to dead heart. 		<ul style="list-style-type: none"> • Apply 2 g phorate (Thimmet 10G) per meter of row length. 			
	Pink stemborer	<i>Sesamia inferens</i>	Tane ki sundi	<ul style="list-style-type: none"> • Larvae enter the stem which results into deadheart. • Infested plant stem generally break down. 	July	<ul style="list-style-type: none"> • Intercropping maize with non-hosts crops like legumes (cowpea). 	-	-	-
	Corn leaf aphid	<i>Rhopalosiphum maidis</i>	Tela	<ul style="list-style-type: none"> • Aphids infest leaves, leaf sheaths and inflorescences. • Most severe damage occurs to the tassel. 	September	<ul style="list-style-type: none"> • Foliar spray of imidacloprid 200SL or thiamethoxam 25 WDG @ 0.005%. 	-	-	-
Paddy	Grasshopper	<i>Hieroglyphus</i> spp., <i>Chrotogonus</i> spp.	Tidda	Damage germinating crop by cutting the plants in nursery and in the fields. The adults are often serious and attack the periphery of the panicles .	Regular	<ul style="list-style-type: none"> • Clean cultivation by removing weeds • Bunds must be cleared off grasses and weeds • Spray 1250 ml Chlorpyriphos 20 EC per 500 L water/ha on appearance of pest. 	Dusting of wood ash		Local people
	Leaf folder	<i>Cnaphalocrocis medinalis</i>		Caterpillars infest leaves of young plants by fastening the edges of the leaf together and live inside rolled leaf. Occasionally cause serious damage at vegetative stage	Occasional / at vegetative stage	<ul style="list-style-type: none"> • Clip-off the affected leaves. • Remove weeds especially graminaceous ones • Spray 1250 ml chlorpyriphos 20 EC (per 500 L water/ha on pest appearance. 	Clip-off the affected leaves		Local people

	Stem borer	<i>Scirpophaga innotata</i>		Damage is caused by feeding of the larvae within the stem. The damaged plants result in 'dead heart' and 'white head' formation	Occasional at vegetative stage	<ul style="list-style-type: none"> Apply carbofuran 3 G by broadcasting in 3-4 cm deep standing water @ 1 kg/ha (a.i.) 10 days after transplanting, if necessary. 			Local people
	Leafhopper	<i>Nilaparvata lugens</i>		Nymphs and adults of hoppers suck the sap	July - August	<ul style="list-style-type: none"> Spray 1250 ml Chlorpyrifos 20 EC per 500 L water/ha on appearance of pest. 			
	Caseworm	<i>Nymphula depunctalis</i>		Larvae feed on the leaves and crop appears as is cut with the help of scissors.	Kharif	Spray chlorpyrifos 20EC @1250ml in 500L of water/ha.			
	Whorl maggot	<i>Hydrellia philippina</i>		Maggot feed leaf whorl	Regular	<ul style="list-style-type: none"> Spray 1250 ml Chlorpyrifos 20 EC per 500 L water/ha on appearance of pest. 			
	Chaffer beetle	<i>Popillia lucida</i>		Adults feed on panicles	Sporadic	<ul style="list-style-type: none"> Spray 1250 ml Chlorpyrifos 20 EC per 500 L water/ha on appearance of pest. 			
	Black beetle	<i>Heteronychus lioderes</i>		Adult feed on roots	Sporadic	<ul style="list-style-type: none"> Soil application of chlorpyrifos 			
Wheat	Termite	<i>Odontotermis obesus, Microtermis obesi</i>	Deemak	Infest crop at germination stage. Cause yellowing and patchy growth of wheat visible from seedlings to maturity	Regular	<ul style="list-style-type: none"> Remove stubbles of previous crop before sowing. Termite mound should be destroyed in vicinity of crop Seed treatment with chlorpyrifos 			

						<p>20 EC (4ml/kg seed)</p> <ul style="list-style-type: none"> • Soil application of 2lt.chlorpyriphos 20 EC mixed in 25 kg sand per ha at the time of sowing 			
	Grasshopper	<i>Hieroglyphus</i> spp., <i>Chrotogonus</i> spp.	Tidda	Feed on foliage and soft stem of young plants	Regular	<ul style="list-style-type: none"> • Bunds must be cleared off grasses and weeds • Collect and destroy the insect • Dust Folidol 2% @ 20-25 kg/ha It is better to dust the grass on bunds and in waste land near the field before germination of wheat and barley as hopper migrate to germinating crop from these sources. 	Dusting of wood ash		Local people
	Aphid	<i>Rhopalosiphum maidis</i> , <i>Sitobion avenae</i>	Tela	Suck sap from soft leaves, stem and developing grains from December till crop maturity and ultimately inhibiting grain formation	Regular	<ul style="list-style-type: none"> • Follow common cultural, mechanical and biological practices • Spray 750 ml methyl demeton 25 EC or dimethoate 30EC in 750 l water/ ha • Generally, natural enemies present in the field help in controlling the population of this pest 	Dusting of wood ash		Local people

	Borer	<i>Helicoverpa</i> spp.	Sundi	Damage wheat ear heads at grain development stage heat, wheat serve as a bridge host for carry over of this polyphagous pest	Occasional / near harvesting stage	<ul style="list-style-type: none"> • Damage is near harvest, so only mechanical control 			
Gram (Chickpea)	Gram pod borer	<i>Helicoverpa armigera</i>	Falli ki sundi	<ul style="list-style-type: none"> • The larvae feed on leaves and bore into pods. 	March	<ul style="list-style-type: none"> • early sown crop escapes the infestations • intercrop with wheat, mustard and linseed • Apply HaNPV @ 250LE/ ha • Spray the crop with lambda-cyhalothrin 5% EC @ 400-500ml/ 400-600 L/ ha 	-	-	-
	Aphids	<i>Aphis craccivora</i>	Tela	<ul style="list-style-type: none"> • Aphid is dark green to black Bean aphids. • Attack terminal leaves, flower heads, and stems of pods. 	Regular	<ul style="list-style-type: none"> • Foliar application of imidacloprid 200SL (0.005%), acetamiprid 20SP (0.01%), lambda cyhalothrin 5EC (0.008%) 	-	-	-
	Black cutworm	<i>Agrotis ipsilon</i>	Katua Keet/ Toka	<ul style="list-style-type: none"> • Found during day time hiding in soil close to stems. • Larva cut the seedling plants and feed. 	April-June & Oct-Nov	<ul style="list-style-type: none"> • Hand picking and destruction of larvae. • Apply chlorpyrifos 20 EC @ 2 litres/ ha 	-	-	-
	Common cutworm	<i>A. segetum</i>	Katua Keet/ Toka	<ul style="list-style-type: none"> • Found during day time hiding in soil close to stems • Larva cut the 	April-June & Oct-Nov	<ul style="list-style-type: none"> • Hand picking and destruction of larvae. • Apply 	-	-	-

				seedling plants and feed.		chlorpyrifos 20 EC @ 2 litres/ ha			
	Termites	<i>Microtermes obesi</i> <i>Odontotermes obesus</i>	Deemak	<ul style="list-style-type: none"> • Build tall (2-4 m), cylindrical mounds or termitarium. • Workers damage roots. 	Regular	<ul style="list-style-type: none"> • Locating and destroying termite nests. • Use well decomposed FYM • Applying chlorpyrifos 20 EC @ 2 litres/ ha after mixing with 20-25 kg of sand 	-	-	-
Mash	Blister beetle	<i>Mylabris pustulata</i>	Ghodi	Adults feed voraciously on flowers	Regular/ at flowering and pod bearing stage	<ul style="list-style-type: none"> • Collect and destroy beetle • Spray 625 ml methyl parathion 50 EC in 625 L water/ ha. 	Collect and destroy beetles		Local people
	Hairy caterpillar	<i>Spilosoma obliqua</i>	Jhan	Feed gregariously on foliage and soft stems of young plants	Occasional at vegetative stage	<ul style="list-style-type: none"> • Collect and destroy the congregating caterpillars. • Dust Folidol 2% @ 20-25 kg/ha 			
	Black bean bug	<i>Chauliops</i> spp.	-	Sap feeder	Minor	-	-	-	-
Rapes eed- musta rd	Cabbage aphid	<i>Brevicoryne brassicae</i>	<i>Tela</i>		Rabi *	<ul style="list-style-type: none"> • Spray methyl demeton 25EC or dimethoate 30EC @ 1ml/l. • If crop is meant for 'Sag' purpose, then spray malathion 50EC @ 1ml/l and observe 1 week waiting period 			
	Mustard aphid	<i>Lipaphis erysimi</i>	<i>Tela</i>		-do-	• -do-			
	Green peach aphid	<i>Myzus persicae</i>	<i>Tela</i>		-do-	• -do-			
	Mustard saw fly	<i>Athalia lugens</i>	-		-do-	• Spray malathion			

		<i>proxima</i>				50EC @ 1ml/l			
	Cabbage butterfly	<i>Pieris brasscae</i>	-		-do-	• -do-			
	Pea leaf miner	<i>Chromatomyia horticola</i>	-		-do-	• Spray methyl demeton 25EC or dimethoate 30EC @1ml/l. in crop meant for seed			
	Painted bug	<i>Bagrada hilaris</i>	-		-do-	• -do-			
	Flea beetle	<i>Phyllotreta cruciferae</i>	-		-do-	• -do-			
Til	Hairy caterpillar	<i>Spilosoma obliqua</i>	Jhan	• Feed on leaves and growing shoots	Vegetative stage	• Collect and destroy the gregarious caterpillars • Spraying cypermethrin @ 0.01% when the caterpillars are small in size (less than 2mm)	-	-	-
	Jassids	<i>Amrasca biguttula biguttula</i>		• Suck cell sap from leaves	-do-	• Apply phorate 10 CG @ 10kg/ha • Spray oxy demeton methyl @ 0.025%	-	-	-
	Leaf roller	<i>Antigastra catalaunalis</i>		• Young larvae roll the leaves and feed inside	-do-	• Spray quinalphos @0.05%	-	-	-
Soybean	Bean bug	<i>Chauliops species</i>	-		Kharif	• -			
	Girdle beetle	<i>Nupserha nitidior</i>	-		-do-	• Watch for drooping and drying of leaves. • Manually remove the infested plants or plant parts from below the girdles. • Alternatively, spray triazophos 40% EC			

						@ 625 ml/ha.			
	White fly	<i>Bemisia tabaci</i>	-		-do-	-			
	Jassids	-	-		-do-	-			
	Cabbage semilooper	<i>Thysanoplusia orichalcea</i>	-		-do-	Apply triazophos 40 EC @ 625 ml/ha or chlorantraniliprole 18.5 SC @ 150 ml/ha.			
	Blister beetles	<i>Epicauta</i> species	-		-do-	-			
Potato	Greasy cutworm	<i>Agrotis ipsilon</i>	Katua Keet/ Toka	<ul style="list-style-type: none"> • Found during day time hiding in soil close to stems • Newly hatched larvae first feed on haulms and then drop from plants and feed underground on stems and tubers 	April-June & Oct-Nov	<ul style="list-style-type: none"> • Forking the soil exposes the larvae to avian predators • Apply chlorpyrifos 20 EC @ 2 liters/ ha after mixing with 20-25 kg of sand 			
	Common cutworm	<i>A. segetum</i>							
	White grubs	<i>Holotrichia longipennis</i> <i>Anomala dimidiata</i> <i>Melolontha</i> spp	Safed Gidar	<ul style="list-style-type: none"> • Soil dwelling grubs are present in soil at a depth of 5-20 cm • Grubs make large, shallow, and circular holes in tubers 	June-Oct	<ul style="list-style-type: none"> • Ploughing to expose grubs, pupa and newly formed adults to birds • Beetle collection at night and killing in water mixed with kerosene • Chlorpyrifos 20 EC @ 2 litres/ ha after mixing with 20-25 kg of sand • Insecticide application should occur soon after adult emergence, and should 			

						coincide with egg laying or egg hatching			
Potato tuber moth	<i>Phthorimaea operculella</i>	Aalu ka Patanga	<ul style="list-style-type: none"> •Pest of field and storage •Larvae tunnes into foliage, stem and tubers 	March-June	<ul style="list-style-type: none"> • Healthy seed tubers should be planted at 10 cm depth • Irrigating the field to avoid crack formation • Covering stored potatoes with a 2 centimeter-thick layer of dry leaves of <i>Lantana</i> or <i>Eucalyptus</i> • Seed tubers treatement with malathion 5D @125 g/quintal of tubers • Spray cypermethrin 25 EC @ 450ml/750L water/ha at 15 days interval 				
Green Peach aphid	<i>Myzus persicae</i> (Sulzer)	Tela	<ul style="list-style-type: none"> •Aphids can injure a potato plant directly by sap feeding and indirectly by transmitting several important potato viruses 	Regular	<ul style="list-style-type: none"> • Seed plots must be kept free of aphids • Selection and rouging of plants infected with a virus • Foliar sprays of dimethoate @ 1ml/L of water/ha • Imidacloprid and thiamethoxam also provide effective 				

						protection			
	Red ants	<i>Dorylus orientalis</i> <i>D. labiatus</i>	Cheenti	<ul style="list-style-type: none"> •Live in colonies, there may be one or several queens •Damages potato stems and tubers by chewing holes 	Minor	<ul style="list-style-type: none"> • Applying a spray with chlorpyrifos to the soil as a pre-planting dust formulation or as a post-planting spray 			
	Wire worms	<i>Drasterius</i> sp.		<ul style="list-style-type: none"> •Major damage occurs from time of tuber initiation until harvest •Bore into the tubers and make cylindrical holes 	June-Oct	<ul style="list-style-type: none"> • Rotation with legume crops • Keep fields weed-free • Insecticides incorporated into ridges immediately before planting can reduce tuber damage • Phorate applied in furrows is approved for the control of wireworms in potatoes 			
	Tobacco caterpillar	<i>Spodoptera litura</i> <i>Spodoptera exigua</i>	Kali Sundi	<ul style="list-style-type: none"> •The caterpillars hide during day in crevices and feed at night. •Defoliation of foliage 	June-Oct	<ul style="list-style-type: none"> • Collect and destroy eggs and larvae mechanically • Ploughing to expose and kill pupae in the soil • Flood irrigation may drown the hibernating caterpillars and pupae • Spray Cypermethrin 25 EC or Lamba cyhalothrin 5 EC 			

						@ 600 ml/ 750L of water			
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