PROMISING LINES REGISTERED IN NBPGR, NEW DELHI

Sr. No.	Crop	Variety	Registration Number	Year of registration
1.	Fenugreek	HM-346	INGR No.001012	1999
2.	Fenugreek	HM-350	INGR No.001013	1999
3.	Tomato	Hisar Lalit (NT 8)	INGR No.003030	1999
4.	Tinda	HT-10	INGR No.099036	2001
5.	Brinjal	H-9	INGR No.099037	2001
6.	Brinjal	HLB-12	IC-296852	2002
7.	Radish	Hisar Selection-1	IC-296853	2002
8.	Okra	HRB 108-2	IC-296854	2002
9.	Okra	HRB 107-4	IC-296855	2002
10	Brinjal	HLB-25	IC-296906	2005
11	Okra	HBH-142 (Hybrid)	IC512238	2005
12	Onion	HOS-1	IC545627	2006
13	Onion	HO-3		2009
14	Garlic	HG-17	IC-568684	2009
15	Onion	HO-4	IC599567	2012
16	Bottle gourd	GH-22	IC598843	2014
17	Bottle gourd	HBGH-35	IC598844	2014
18	Brinjal	HLB-12		2015
19	Bitter gourd	HK-127	IC620552	2016

Varieties identified/released

The characteristics features of different varieties developed by this department are given below:

List of varieties of different vegetable crops released at National Level

Sr. No.	Crop	Variety	Year of release	Yield (q/ha)	Salient features
1	**Tomato**	HS-101	1977	250-275	Plant determinate, sturdy, multi-branched, fruits in clusters of 2-3, round, small to medium in size, red on ripening and suitable

					for winter season
2	**Tomato**	HS-102	1977	250-275	Plant determinate, fruit in clusters of 3-4, small to medium in size, uniform in ripening and suitable for winter and summer season
3	**Tomato**	Hisar Lalit	1992	250-300	Plants determinate, fruit maturity in 65-70 days after planting, av. fruit weight 50g, resistant to root knot nematodes
4	**Tomato**	Hisar Arun	1990	275-300	Plant determinate, heavy bearer, early and high yielding
5.	**Brinjal**	PH-4	1976	250-300	Plant bushy, fruit medium long to long and thin, deep purple in color, flesh light green
6	**Brinjal**	BR-112	1976	250	Early, plants are bushy, fruits round with bright purple colour and fleshy
7	**Brinjal**	Hisar Shyamal	1991	300-325	Early, high yield, fruits round, bright, dark purple, tolerant to little leaf and bacterial wilt diseases
8	**Okra**	Varsha Uphar	1992	90-100	Plant medium tall, suitable for rainy season, fruiting starts on third/fourth node, resistant to yellow vein mosaic (YVM) disease
9	**Okra**	Hisar Unnat	1996	100-110	Suitable for rainy season, fruiting starts on third/fourth node, resistant to YVM disease
10	**Okra**	Hisar Naveen	2006	110-120	High yielding variety, tolerant to YVM disease and suitable for rainy season
11	**Okra**	HBH-142 (hybrid)	2006	135-150	High yielding hybrid, suitable for rainy season, fruiting starts on third/fourth node, resistant to YVM disease
12	**Cauliflower**	Hisar-1	1976	250	Suitable for mid-late season, curds medium-large size and white in color
13	**Long Melon**	Kamal Selection	1981	90-100	A prolific bearer, fruits tender light green, long thin, flesh crisp with good flavor
14	**Onion**	Hisar-2	1976	200-250	Bulbs bronze-red in color, flattish globular in shape, more pungent, better shelf life
15	**Onion**	Hisar Onion-3	2009	320-350	Bulbs globular shaped, tight skinned with thin neck, high yield, less bolting, good storage life
16	**Fenugreek**	Hisar Sonali	1994	20-25	Quick growing, dual purpose and high yielding
17	**Fenugreek**	Hisar Mukta	2005	23-26	Early, light green foliage, resistant to downy mildew, seed bold brown green
18	**Fenugreek**	HM-219	2009	20-22	High yielding, resistance to powdery mildew
19	**Fenugreek**	HM-348	2012	20-22	High yielding ,dual purpose suitable for leaf as well as seed production, moderately resistant to powdery mildew
20	**Coriander**	Hisar Anand	1994	20-25	Mid-late, dual purpose, bold seeded, high yielding

List of varieties of different vegetable crops released at State Level

Sr. No.	Crop	Variety	Year of release	Yield (q/ha)	Salient features

1.	**Tomato**	HS-110	1974	200-250	Plant determinate, potato leaf type, late, fruits large fleshy, suitable for table and processing
2	**Brinjal**	Hisar Pragati	1991 1993	325-350	Suitable for summer season, fruits long bright dark purple colored
3	**Brinjal**	HLB-25	2012	200	Heat tolerant and suitable for summer season, fruits medium long, slender and bright purple with tolerance and tendency to set fruits at high temperature
4	**Brinjal**	HLB-12	2015	350-375	Tolerant to high temperature and shoot and fruit borer
5	**Chilli**	Hisar Shakti	1995	170-190	Fruits upright in clusters, pointed, thin, medium long, highly pungent, tolerant to leaf curl mosaic virus, fruit rot and powdery mildew
6	**Chilli**	Hisar Vijay	1995	170-190	Early, fruit similar to Hisar Shakti but with blackish tinge on fruit surface under low temperature, tolerance like Hisar Shakti
7	**Carrot**	Hisar Gairic	1991	300	Self-cored, high carotene, high yield, roots longer than Pusa Kesar
8	**Radish**	Hisar Sel-1	2001	300-325	High yield, roots medium long, smooth white, tender and mildly pungent with white shoulder and short tops. Its root: shoot ratio (1.70: 1) is higher than the check varieties (1.3:1).
9	**Indian Bean**	Hisar Kirti	1995	200-220	Early variety, pods flat, dark green in color with better shelf life
10	**Bottle gourd**	HBGH-35 (Hybrid)	2016	353.4	Medium long green colour fruit, fruit size at blossom end is more than stem end with bit flat blossom end portion.
11	**Bottle gourd**	GH-22	2016	320.8	Medium long, green colour fruit, blossom end of fruit more than stem end with round bottom and slight straight neck.
12	**Indian Melon**	Hisar Tinda	2006	75-100	Early and high yielding, fruits round-medium sized, tender and tolerant to downy mildew and root rot wilt
13	**Ridge gourd**	Hisar Kalitori	1995	80-100	Early long thin and straight fruited variety, tolerant to powdery mildew, suitable for rainfed areas
14	**Onion**	Hisar Onion-4	2016	312-320	Bulbs globular and rose red in colour, less bolting (5.4%), high TSS (14.2%), dark green leaves
15	**Garlic**	HG-17	2012	120-125	High yielding, good storage life, bulb weight is better than other varieties and has least incidence of purple blotch disease
16	**Fenugreek**	Hisar Madhavi	1999	20-25	Plants erect, green stern, foliage dark green, resistant to powdery mildew and tolerant to downy mildew
17	**Coriander**	Narnaul Selection	1978	15-20	Multi-branched, bold seeded, can give one leaf cutting in seed crop

List of varieties of different vegetable crops recommended for release by AICVIP/ AICRP

Sr. No.	**Crop**	**Variety**	**Year of release**	**Yield (q/ha)**	**Salient features**
1.	**Tomato**	Hisar Lalima	1992	275-300	Plant determinate, extremely early medium large fruited
2	**Tomato**	Hisar Gaurav	1996	300-325	Plant determinate, high yield, large attractive fruits
3	**Tomato**	H-24	1997	200-225	Plant determinate, fruit medium size, attractive, tolerant to leaf curl virus

4	**Tomato**	H-86	1997	225-250	Plant determinate, fruit medium large size, attractive, tolerant to leaf curl virus
5	**Brinjal**	Hisar Jamuni	-	260-280	Fruits oblong, dark bright purple color and high yielding
6	**Pea**	Hisar Harit	1993	80-100	Medium, double-podded variety, pods long green well filled.
7.	**Fenugreek**	Hisar Suvarna	1997	18-20	Early, high yielding, resistant to *Cercospora* leaf spot
8	**Coriander**	Hisar Sugandh	2001	18-20	Mid-season, high yielding with high oil content
9	**Coriander**	Hisar Bhoomit	2008	16-18	High green leaf yield, high oil content(0.66%) and resistant to stem gall disease
10	**Coriander**	Hisar Surbhi	2006	18-20	High yield, high oil content(0.425%) and tolerant to frost and aphid
11	**Coriander**	DH 206	2009	20	Dual type, high yielding resistant to powdery mildew
12	**Coriander**	DH-220	2013	18-20	Early maturing (130days),medium size seed with high oil content, less susceptible to powdery mildew
13	**Fennel**	HF-33	2001	20-22	High yielding
14	**Fennel**	HF-143	2013	17-20	High yielding with high volatile content (2.37%)
15	**Ajowain**	HAJ-18	2013	10-12	Erect type, high yielding and resistant to lodging
16	**Potato**	Kufri Neelkanth	2017	350-380	Purple colour tubers, high yielding and rich in antioxidant content
17	**Potato**	Kufri Lima	2017	270-300	Early season and heat tolerant variety mature in 70-80 days
18	**Potato**	Kufri Ganga	2017	350-400	Medium maturing, high yielding, white skinned with shallow eyes
19	**Fenugreek**	HM-425	2018	20-22	High yielding, tolerant to powdery mildew and resistant to downy mildew

List of varieties of different vegetable crops identified/recommended for release by the university

Sr. No.	Crop	Variety	Year of release	Yield (q/ha)	Salient features
1	**Tomato**	HTH-2-2 (Hybrid)	2003	325-365	The average yield of this hybrid is 22, 57, 67 and 43% higher than hybrids Rashmi, DTH-8, ARTH-3 and variety Hisar Arun (Sel-7), respectively.
2	**Okra**	HRB 108-2	2001	110-120	High yielding variety, tolerant to YVM disease and suitable for rainy season
3	**Okra**	HB-03-25-2	2013	125.9	Suitable for dehydration and resistant to yellow vein mosaic virus
4	**Okra**	HBT-49-1	2013	145.5	High yielding with dark green and smooth fruits,suitable for summer season
5	**Carrot**	HCP-1	2001	277	Long, smooth, purple and self-core colour root variety gives higher yield. Its root to shoot ratio is 2.25. The variety will fulfill the demand of deep colour roots
6	**Carrot**	HCB-1	2001	223	Black, long, smooth rooted variety, which is good for the preparation of juice, *kanji*, candy and coloured vine. Its root to shoot ratio is 2.1.
7	**Peas**	HVPE-3-5	2013	102.5	High yielding, sweet edible pod and

					resistant to shattering.
8	**Bitter gourd**	HK-127	2013	125 .0	Fruit oblong shaped, green colour with smooth spines having prominent continuous ribbing.
9	**Bitter gourd**	HKH-56	2016		Fruit medium long shaped, green colour with smooth spines having prominent continuous ribbing.
10	**Musk Melon**	Hisar Saras	1991	80-100	Early, fruits round, green flesh, netted, tolerant to downy mildew
11	**Musk Melon**	Hisar Madhur	1991	90-100	Early, fruits round, brownish yellow with stripes, tolerant to red pumpkin beetle
12	**Water Melon**	HW-1	1990	275-300	Small, round, green stripe fruits, deep red flesh, suitable for kitchen garden, high TSS
13	**Water Melon**	Fuken	1990	325-350	Fruits round, thick skinned, red fleshed, 3-5kg fruits, good for transport, high TSS
14	**Turmeric**	Hisar Kanchan	2013	87-90	Rhizome large and bulky finger
15	**Fenugreek**	Hisar Manohar	2013	20-22	Foliage dark green, seed green in color resistant to downy and powdery mildew diseases Hisar Manohar

SIGNIFICANT PRODUCTION TECHNOLOY DEVELOPED IN VEGETABLE CROPS

• Weed management in vegetable and seed spice crops

In vegetable and seed spice crops, weedicide pendimethalin has been found effective in controlling the broad leaf weeds when applied as pre-emergence. In potato pendimethalin @ 1.200-1.500 kg/ha (Stomp 30% 4-5 liter/ha), in onion, garlic, brinjal, chilli, peas 1-1.250 kg/ha (Stomp 30% 3.250-4.250 liter/ha), tomato, cauliflower, fennel (saunf), coriander and methi @ 1 kg/ha (Stomp 30% 3.250 liter/ha).

Pre-emergence or early post emergence (10 DAT) application of Raft 1.667 kg/ha or Goal 850 g/ha per acre either through sand mix (150 kg) or spray after irrigation along with one hoeing at 45 days after planting has been found very effective to control weeds (Hirankhuri, Bathu & Senji) in onion and garlic.

• Salt tolerance of vegetable crops

Various vegetable crops were evaluated for salt tolerance. Studies indicated that peas could be grown only up to 4 dsm^{-1}. Okra, cauliflower, carrot, radish, turnip, onion, brinjal, Indian bean and cowpea up to 6 dsm^{-1}. Spice crops as fenugreek, coriander and fennel can be grown up to 7.5dsm^{-1} while palak (beet leaf) and garlic up to 10 dsm^{-1}.

• Use of sodic water

Sodic water can be used after complete neutralization of RSC (100%). In order to neutralize RSC of 1.0 me/liter, 70 kg gypsum of 80% purity per irrigation per hectare is required. FYM @ 20 tones per hectare should be applied before sowing/transplanting for growing different vegetable crops, *viz*. potato, tomato, brinjal, onion, cabbage, cauliflower, knol-khol, broccoli, bottle gourd, ridge gourd, bitter gourd, okra and guar.

• Use of micro-sprinkler irrigation in potato

Application of irrigation in potato cv. Kufri Bahar and Kufri Badshah through micro-sprinklers for two hours at three days interval in October to November, four days interval in December to January and five days interval February to harvest of the crop for increased water use efficiency and tuber yield.

Off-season production of coriander	
when the crop was sown in May-June under 50% shading net during off-season, the coriander variety DH-228 produced leaf yield of 100 q/ha (two cuttings).	
• Use of plastic low tunnels for early production of bottle gourd	

Bottle gourd crop under plastic low tunnels gave highest early and total yield when sowing is done on 15 December. First picking starts in second week of March and total yield is about 500 q/ha.		
• **Raising of vegetable seedlings in polyhouse for early production**		
Use cocopit, vermiculite and perlite in the ratio of 3:1:1 on volume basis in portrays for raising the seedlings.		

The following recommendations has been generated and included in package of practices in Horticulture officer workshop held on 18.05.2017

- Early crop of potato cv. Kufri Pushkar can be raised between 15-30 September by applying irrigation through micro sprinkler which produce 163 q/ha tuber yield, which was 121% higher than furrow irrigation after 75 days of planting.
- In garlic, foliar spray of urea 1.5% + $ZnSO_4$ at 0.5% at 30, 45 and 60 days after planting along with recommended dose of fertilizers produced 12.9% higher yield (137.9 q/ha) over control (RDF).
- In onion, seeds primed with *Neem* leaf powder 100 g/kg of seeds maintained germination higher than the control after a storage period of 12 months.

• **Use of plant growth regulators (PGR) in cucurbits**

Crop	PGR	Dose/hectare	Amount of water (liter)	Stage
Bitter gourd	Cycocil 50%	25 ml	50	2 and 4 true leaf stage
Bottle gourd	Etheral 50%	10 ml	50	2 and 4 true leaf stage
Summer squash	Etheral 50%	25 ml	50	2 and 4 true leaf stage

Cucumber	Etheral 50%	10 ml	50	2 and 4 true leaf stage
Long melon	Etheral 50%	25 ml	50	2 and 4 true leaf stage
Muskmelon	Etheral 50%	25 ml	50	2 and 4 true leaf stage
Round gourd	Etheral 50%	10 ml	50	2 and 4 true leaf stage
Pumpkin	Etheral 50%	25 ml	50	2 and 4 true leaf stage
Ridge gourd	Etheral 50%	10 ml	50	2 and 4 true leaf stage
Sponge gourd	Etheral 50%	10 ml	50	2 and 4 true leaf stage
Watermelon	GA_3	1.25 g + Alcohol	50	2 and 4 true leaf stage

Brief Package of Practices of Vegetable Crops (per acre)

Crop	*Sowing time*	*Seed rate*	*Spacing*	*Fertilizer* (t: kg) *FYM: N: P: K*	*Yield (q)*	*Seed yield (q)*	*Varieties*
Potato	End Sept.-Mid. Oct.	12 q	60 x 20 cm	20t:50-60:20:40	100-120	80-90	K. Khyati, K. Pukhraj, K. Bahar
Tomato	Nov.-Dec.	200 g	60 x 45 cm	10t: 40:25:20kg	100-120	1-1.50	Hisar Arun, H. Lalit
Eggplant	June-July, Nov.	200 g	75 x 60 cm	10t: 40:20:10kg	100-125	2.5-3.0	Hisar Shyamal, H. Pragati, BR-112
Chilli	May-June	400 g	60 x 45 cm	10t: 25:12:12kg	40-50	2.0	Hisar Shakti, H. Vijay
	Oct-Nov	400 g	60 x 45 cm	10t: 25:12:12kg	40-50	2.0	Hisar Shakti, H. Vijay
Cauliflower	May-June	350 g	45 x 30 cm	20t: 50:20:20kg	60	2.5-4.0	Pusa Katki
	Mid July-1st Aug	250-300g	60 x 60 cm	20t: 50:20:20kg	90	3-4	Punjab Giant-26 & 35
	Oct-Nov	250-300g	45 x 45 cm	20t: 50:20:20kg	60	----	Pusa Snowball K-1

Cabbage	Sept-Nov	200-250g	45-60 x 30-45 cm	20t: 50:20:20kg	80-100	----	P. Mukta, Drum Head Late
Kohlrabi	Sept.-Nov.	800 g	30 x 10-15 cm	20t: 50:20:20kg	40-50	----	White Vienna, Purple Vienna
Onion *Rabi*	Oct.-mid. Nov.	4 kg	15 x 10 cm	20t: 50:20:10kg	100	10-12	Hisar-1, Pusa Red
Onion *Kharif*	Mid June	5-6 kg	15 x 10 cm	10t: 50:16:10kg	125	-----	N-53 (Agrifound Dark Red)
Onion sets	Mid Aug-Mid Sept	1.5-2 q of 3-5 g	45 x 10 cm both sides	10t: 50:16:10kg	120	-----	--do--
Garlic	Sept. end- Oct.	1.5-2 q	15 x 10 cm	20t: 32:20:10kg	40-45	40-45	G–1, Yamuna Safed-1, 2, 3
Okra	Feb-March	16 kg	30 x 10 cm	10t: 40:24:00kg	30	8-10	Varsha Uphar, Hisar Unnat
	June-July	5 kg	45 x 30 cm	10t: 40:24:00kg	40	10-12	--do--
Carrot	Oct-Nov.	4-5 kg	30-45 x 6-8cm	20t: 24:12:12kg	100	5-6	Hisar Gairic, Nantes
Radish	Oct-Nov.	3 kg	30-4 5x 6-8cm	20t: 24:12:00kg	40-100	5-6	P. Chetki, H. Sel.-1, P. Himani
Turnip	Oct-Nov.	2 kg	30-45 x 6-8cm	20t: 24:12:00kg	80-90	5-6	4-White, Pusa Sweti
Pea	Mid Sept-Mid Nov.	20-30 kg	30-40 x 3-5cm	08t: 12:20:00kg	20-30	15-20	Arkel, PH-1, Bonneville
Cowpea	Feb.-March, Jun-Jul	8 kg	30 x 15 cm	04t: 10:16:00kg	16	15	Pusa Phalguni, P. Dofasali, P. Komal
Cluster bean	Feb-March	6 kg	30 x 15 cm	04t: 12:20:00kg	20	6	P. Navbahar
	June-July	6 kg	45 x 20 cm	04t: 12:20:00kg	20	6	Pusa Mausami
Indian bean	End July	2-3 kg	3 m x 45 cm	04t: 12:16:00kg	85	8	Hisar Kirti
Palak	Aug.-Dec.	8-10 kg	20 x 5 cm	20t: 32:16:00kg	32-40	2-15	HS-23, Jobner Green, All Green
Arum	Feb.-March	3-4 q	45 x 30 cm	18t: 40:20:00kg	90	70-80	Sree Pallavi, Sree Rashmi,

	June-July	3-4 q	60 x30 cm	18t: 40:20:00kg	90	90-10	Panchmukhi, Kovvur, Sahsramukhi
Sweet potato	Jan.-Feb. (N) April-July (T)	40 kg	60 x 25 (N) 60 x 30 cm(C)	10t: 32:36:32kg	80-100	80	Pusa Safed, Pusa Lal
Muskmelon	Feb.-March	1 kg	2 m x 60 cm	06t: 20:12:10kg	30-40	2-3	Pb. Sunehri, Hara Madhu
Watermelon	Mid Feb.-March	2 kg	3-4 m x 60 cm	06t: 20:10:10kg	60	2-3	ugar Baby, Charleston Grey
Long melon	Feb.-March	1 kg	2 m x 60 cm	06t: 20:10:10kg	40-50	2-3	Karnal Sel., Lakhnow Early
Cucumber	Feb.-March, Jun-July	1 kg	1.5 m x 60 cm	06t: 20:10:10kg	40	1-2	Japanese Long Green, Straight-8
Indian melon	Feb.-March, Jun-July	2 kg	1.5 m x 45 cm	06t: 20:10:10kg	40	5-7	Bikaneri Green, Hisar Tinda,
Bottle gourd	Feb.-March, Jun-July	2 kg	2 m x 60 cm	06t: 20:10:10kg	40	4-5	PSPL, PSPR, Pusa Naveen
Bitter gourd	Feb.-March, Jun-July	2 kg	1.5 m x 45 cm	06t: 20:10:10kg	30-40	5-7	Pusa Domausami, Pusa Visesh
Sponge gourd	Feb.-March, Jun-July	2 kg	2 m x 60 cm	06t: 20:10:10kg	40-50	6-8	Pusa Nasdar
Summer squash	Nov.-Dec.	2 kg	80x50 cm	06t: 20:10:10kg	40-50	6-8	Pusa Alankar
Pumpkin	Feb.-March, Jun-July	2 kg	3 m x 60 cm	06t: 20:10:10kg	80-100	4-5	Pusa Vishwas, Arka Chandan
Fenugreek	Sept-Nov.	8 kg	20-25 x 10 cm	08t: 25: 20:00kg	30	8	PEB, Hisar Sonali, Kasuri Methi
Coriander	Sept.-Dec.	4-6 kg	20-30 x 20 cm	08t: 25: 20:00kg	8	8	Hisar Anand, Hisar Sungndh
Fennel	15-30 Oct.	4-6 kg	30-40 x 20 cm	08t: 20: 10:00kg	8	8	Gujrat Saunf, Palavi SF-35, HF-33
	15 Sept. (nursery)	2-3 kg					
Cumin	15 Nov. -15 Dec.	3-4 kg	20-30 x 10 cm	06t: 12: 08:00kg	3	3	Rajasthan Jeera-19
Ajowain	Oct .– Nov.	1-2 kg	30-45 x 10 cm	10t: 20: 25:00kg	4-6	4-6	Local

Kalonji	15 Oct.-15 Nov.	3-4 kg	30 x 15 cm	10t: 20: 25:00kg	4-5	4-5	Local
Turmeric	May-July	6-8 q	45 x 20 cm	10t: 40: 20: 20kg	60-80q	60	Local
Ginger	April-June	4-6 q	45 x 30 cm	10t: 40: 20: 20kg	60-80q	60	Local

Cucurbits in polythene bags of 15x10 cm with 2-3 bottom holes in January.

Ethrel 50% 100 ppm in Bottle gourd, Indian melon and sponge gourd (4 ml in 20 liters of water) ; 250 ppm in Long melon & Summer squash (10 ml in 20 liters of water); Cycocel 250 ppm in Bitter gourd (10ml in 20lt water) at 2 and 4 true leaf stage. Also add Tween-20 / Selvett @ one ml per liter solution.

To check flower/ fruit drop, foliar spray of Planofix 10 ppm (1 ml in 4.5 liters of water) at flowering & repeat after 3 weeks.

Weed control in vegetable crops by Stomp (0.4 kg pendimethalin 33%) @ 1.250 lt/ acre after sowing/ transplanting before weed germination