

DEPARTMENT OF AGRICULTURE
Ministry of Agriculture and Forests



Inventory of Released and De-notified
Crops in Bhutan (1988-2020)

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FOREWORD

The Department of Agriculture is pleased to bring out a publication comprising an inventory of released and de-notified crop varieties in Bhutan.

The primary objectives of this publication are to:

- Provide an update on improved varieties released from 1988 to 2020 along with their agronomic information.
- Provide basic information/data on all released varieties, which will serve as a useful reference for researchers, policy makers, regulatory authorities and crop genetic conservationists in the country.

Data for this publication is sourced from the minutes of the Variety Release Committee (VRC) meetings and available literatures published in the country.

The department takes pride in placing on record the release of over 258 improved varieties of field and horticulture crops between the years 1988 and 2020, offering a comprehensive basket of technological choice to our growers. To date, the Ministry of Agriculture & Forests has released 108 fruit plants, 101 vegetables crops, 52 field crops and 2 tea varieties.

As new varieties are released, the old and obsolete varieties are withdrawn from production in order to keep the number of varieties for seed production at a manageable level. Therefore, a total of 37 varieties (27 vegetables, 9 field crops and 1 fruit crops) were de-notified between 1989 and 2015. Seed production of such de-notified varieties is gradually discontinued.

Improved crop varieties are proposed by research centres and seed agencies to the Variety Release Committee (VRC). The VRC, based on the feasibility and potential of the crop, recommends the proposal and submit the list to the National Seed Board, which eventually and officially adopts and releases the crop variety.

The release of new improved crop varieties has huge potential to increase crop productivity. Hence, programs for introduction and development of new varieties should continue to support the growth of seed industry and ensure sustainable development in agriculture.

We earnestly acknowledge everyone involved for all their support and cooperation in taking out this publication.



(Kinlay Tshering)

DIRECTOR

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Table 1. Number of improved field crops released in Bhutan (1988 – 2020)

Field crops	Total varieties released (Nos.)
1. Rice	26
2. Maize	5
3. Wheat	3
4. Finger millet	3
5. Mung bean	2
6. Mustard	5
7. Soybean	4
8. Quinoa	4
Total	52

Table 2. Number of improved fruit plants released in Bhutan (1988-2020)

Fruit crops	Total varieties released (Nos.)	Fruit crops	Total varieties released (Nos.)
1. Areca nut	1	18. Mango	8
2. Almond	4	19. Musk melon	1
3. Apple	15 (3 Rootstocks)	20. Passion fruit	1
4. Apricot	3	22. Peach	4
5. Avocado	2	23. Pear	9
6. Banana	4	24. Persimmon	3
7. Cardamom	2	25. Plum	5
8. Cherry	4	26. Pomegranate	2
9. Dragon fruit	1	27. Pineapple	3
10. Gooseberry	1	28. Pecan nut	2
11. Ground apple	1	29. Strawberry	3
12. Grapes	2	30. Walnut	3
13. Guava	2	31. Watermelon	1
14. Kiwi	5		
15. Lime	1	Total	108
16. Litchi	5		
17. Mandarin/Orange	10 (5 Rootstocks)		

Table 3. Number of improved plantation crops released in Bhutan (2020)

Plantation crops	Total varieties released (Nos.)
1. Tea	2
Total	2

Table 4. Number of improved vegetables released in Bhutan (1988-2020)

Vegetables	Total varieties released (Nos.)	Vegetables	Total varieties released (Nos.)
1. Asparagus	2	17. Cucumber	3
2. Beans	11	18. Garlic	1
3. Beetroot	1	19. Japanese green	2
4. Bottle gourd	1	20. Ladies finger	1
5. Brinjal (Eggplant)	3	21. Lettuce	5
6. Broccoli	1	22. Mustard green	6
7. Bulb onion	5	23. Parsley	1
8. Bunching onion	2	24. Pea	3
9. Cabbage	9	25. Potato	4
10. Capsicum	1	26. Pumpkin	4
11. Chilli	4	27. Radish	5
12. Carrot	5	28. Spinach	2
13. Cauliflower	8	29. Summer squash	1
14. Celery	1	30. Tomato	6
15. Chinese cabbage	1	31. Turnip	1
16. Coriander	1	Total	101

Table 5. Number of de-notified crop varieties

Vegetables	Varieties (Nos.)	Cereals	Varieties (Nos.)
1. Beans	3	1. Rice	3
2. Bulb onion	2	2. Mustard	1
3. Cabbage	2	3. Wheat	3
4. Carrot	1	4. Maize	2
5. Cauliflower	3	Total	9
6. Celery	1		
7. Chilli	1		
8. Cucumber	1		
9. Ladies finger	2		
10. Lettuce	1	Fruits	Varieties (Nos.)
11. Pea	2	1. Watermelon	1
12. Potato	2	Total	1
13. Pumpkin	1		
14. Radish	2		
15. Tomato	2		
16. Welsh onion	1		
Total	27		

Table 6. Released field crop varieties in Bhutan (1988-2020)

Variety	Variety/Breeding line (s)	Year of Release	Releasing Committee	Releasing Agency	Yield Potential (t/ac)	Maturity (DAS)	Recommended Agro-ecology (MASL)	Remarks
1. RICE: <i>Oryza sativa</i>								
1.1. IR 64	IR 64	1988	1 st	RDC- Bajo	2.0-3.2	140-155	600-1500	Released
1.2. No. 11	No 11	1988	1 st	RDC- Bajo	1.6-1.4	160	>1500	Released
1.3. BR 153	BR 153	1988	1 st	RDC- Bajo	1.2-1.6	140-150	<600	Released
1.4. IR 20913	IR 20913-B-26-1-2-2-3	1989	2 nd	RDC- Bajo	1.6-2.4	130-140	600-1500	Released
1.5. Khangma Maap	Chumro	1999	8 th	RDC-Wengkhar	1.6-2.4	120-130	>1500	Released
1.6. Bajo Maap 1	CARD21-10-1-1-3-2-1	1999	8 th	RDC-Bajo	2.0-3.2	150-155	600-1500	Released
1.7. Bajo Maap 2	CARD21-14-1-1-3-2-1B	1999	8 th	RDC-Bajo	2.0-3.0	145-155	600-1500	Released
1.8. Bajo Kaap 1	IR61331-2-148-B	1999	8 th	RDC-Bajo	2.0-3.4	145-155	600-1500	Released
1.9. Bajo Kaap 2	IR61328-1-136-2-1-2-3	1999	8 th	RDC-Bajo	2.0-3.4	150-165	600-1500	Released
1.10. Khangma Ray Kaap 2	Khumal 2	2002	9 th	RDC-Wengkhar	2.0-3.0	160-165	600-1500	Released
1.11. Yusi Ray Maap	Suwon 359/IR41996-118-2-13/Thimphu Maap	2002	9 th	RDC-Yusipang	2.5-3.5	140-160	>1800	Released
1.12. Yusi Ray Kaap	YR3825-11-3-2-1/YR3825-11-3-2-1/Barket	2002	9 th	RDC-Yusipang	2.5-3.5	140-160	>1800	Released
1.13. Wengkhar Ray Kaap 6	Khumal 6	2006	11 th	RDC-Wengkhar	2.0-3.0	160-165	600-1500	Released
1.14. Jakar Ray Naap	Paro china	2006	11 th	RC-Jakar	1.5-2.0	140-160	>2600	Released
1.15. Yusi Ray Kaap 2	YP5-34-16 Akiyutaka/Naam	2010	13 th	RDC-Yusipang	2.0-4.0	132	> 1800	Released
1.16. Yusi Ray Maap 2	YP6-35-21 Akiyutaka/Ray Maap	2010	13 th	RDC-Yusipang	2.0-3.0	134	>1800	Released
1.17. Wengkhar Ray Kaap10	OR 367-SP 11	2010	13 th	RDC-Wengkhar	1.0-2.0	130-140	<700	Released
1.18. Bhur Ray Kaap 1	IR 72102-3-115-1-3-2	2010	13 th	RDC-Samtenling	2.0-3.0	155-160	<700	Released
1.19. Bhur Ray Kaap 2	KARJAT 3	2010	13 th	RDC-Samtenling	1.0-2.0	135-140	<700	Released
1.20. Bhur Kambja 1	APO	2010	13 th	RDC-Samtenling	1.0-1.5	125-130	<700	Released
1.21. Bhur Kambja 2	IR 70181-5-PM1-1-2-B-1	2010	13 th	RDC-Samtenling	1.0-1.5	140-145	<700	Released
1.22. Wengkhar Kambja 1	Machapuchray 3	2017	19 th	RDC-Wengkhar	1.0-3.0	180	1500-2000	Released
1.23. Wengkhar Kambja 2	Zangthi 2	2017	19 th	RDC-Wengkhar	1.0-2.0	175	1500-2000	Released

1.24. Sokha Rey 1	BRR1 Dhan 28	2019	20 th	RDC-Yusipang	2.25		200-800	Released
1.25. Yusirey Kaap 3	YPS-7	2019	20 th	RDC-Yusipang	3.46		1800	Released
1.26. Yusirey Kathra-Mathra Rey	PP4 (38-4)	2019	20 th	RDC-Yusipang	3.78		1800	Released
2. MAIZE: <i>Zea mays</i>								
2.1. Yangtsipa	Suwon 1	1992	5 th	RDC-Wengkhar	1.2-1.6	120-130	<1800	Released
2.2. Chaskharpa	SO3TLYQAB05 (Entry 35)	2012	15 th	RDC-Wengkhar	2.75	170-180	1200-1800	Released
2.3. Shaphangma	ICA V 305 (Entry No. 38)	2012	15 th	RDC-Wengkhar	2.81	180-185	>1800	Released
2.4. Bhur Ashom 1	Arun 4	2015	18 th	RDC-Samtenling	1.30	90-100	<1200	Released
2.5. Wengkhar HTM 1	HTMA ZH111755 Hybrid	2020	22 th	RDC-Wengkhar	1.9	100-120	<900	Released
3. WHEAT: <i>Triticum aestivum</i>								
3.1. Gumasokha Kaa	Agrim	2014	17 th	RDC-Bajo	1.2-1.3	150-160	1400	Released
3.2. Bajosokha Kaa	Baj	2014	17 th	RDC-Bajo	1.3-1.4	155-160	1400	Released
3.3. Bumthang Kaa Drukchu	NL 1064	2015	18 th	RDC-Jakar	1.2-1.3	250	1200-2600	Released
4. FINGER MILLET: <i>Eleusine coracana</i>								
4.1. Lingmethang Kongpu 1	3459	2002	9 th	RDC-Wengkhar	0.7-0.8	120	300-1700	Released
4.2. Limethang Kongpu 2	5459	2002	9 th	RDC-Wengkhar	0.84-0.85	140	300-1700	Released
4.3. Membja – 1	GPU 48	2019	20 th	RDC-Samtenling	2.5	110-115	200 - 1000	Released
5. MUNGBEAN: <i>Vigna radiata</i>								
5.1. Limithang Mung 1	KPS 2	2002	9 th	RDC-Wengkhar	0.30	120-130	800-1200	Released
5.2. Limithang Mung 2	Bari Mung 2	2002	9 th	RDC-Wengkhar	0.30	120-131	800-1200	Released
6. MUSTARD: <i>Brassica campestris</i>								
6.1. M 27	M 27	1989	2 nd	RDC Bajo	0.40	85-90	<2000	Released
6.2. Bajo Peka 1	BSA	1994	7 th	RDC Bajo	0.50	145-155	<2001	Released
6.3. Bajo Peka 2	PT 30	1994	7 th	RDC Bajo	0.40	120-130	<2002	Released
6.4. Yusi Peka 1	Lumle Tori 1	2017	19 th	RDC-Yusipang	0.57	95-100	1500-2600	Released
6.5. Yusi Peka 2	Bari Sharisha 15	2017	19 th	RDC-Yusipang	0.53	90-95	300-1400	Released

7. SOYBEAN: *Glycine max*

7.1. One Daughter	One Daughter	1994	7th	DSC	0.8-1.0	150-160	600-2000	Released
7.2. Khangma Libi 2	GC 86018-427-3	2002	9th	RDC-Wengkhar	0.5-1.0	150-160	800-1500	Released
7.3. Brag	Brag	2002	9th	DSC	1.0-2.0	145-160	600-2000	Notified
7.4. Khangma Libi 1	AGS 258	1999	8th	RDC-Wengkhar	1.0-1.5	154-164	600-2000	Released

8. QUINOA: *Chenopodium quinoa*

8.1. Ashi Heychum AM	Amarilla Maragani	2018	20 th	RDC-Yusipang	0.75	173	150 - 3600	Released
8.2. Ashi Heychum AS	Amarilla Saccaca	2018	20 th	RDC-Yusipang	0.90	170	150 - 3600	Released
8.3. Ashi Heychum Ivory	Ivory 123	2018	20 th	RDC-Yusipang	0.90	150	150 - 3600	Released
8.4. Ashi Heychum TW	DoA-1-PMB-2015	2018	20 th	RDC-Yusipang	0.75	140	150 - 3600	Released

Table 7. Released fruit varieties in Bhutan (1988-2020)

Variety	Variety/Breeding line (s)	Year of Release	Releasing Committee	Releasing Agency	Yield Potential (t/ac or kg/tree)	Maturity / Harvesting Time	Recommended Agro-ecology (MASL)	Remarks
1. ARECA-NUT: <i>Areca catechu</i>								
1.1. Bhur selection	Bhur Selection	2004	10th	DSC	3.0-5.0	Dec-March	<1000	Notified
2. ALMOND: <i>Prunus dulcis</i>								
2.1. Texas	Texas	2004	10th	RDC-Bajo	0.12 kg/tree	Mid-August	1300-2000	Released
2.2. Drake	Drake	2004	10th	RDC-Bajo	0.45 kg/tree	August-September	1300-2000	Released
2.3. Dhebhar Badhan	Dhebhar Badhan	2004	10th	RDC-Bajo	2.5 kg/tree	August-September	1300-2000	Released
2.4. Kagzi	Kagzi	2004	10th	RDC-Bajo	1.6 kg/tree	Early August	1300-2500	Released
3. APPLE: <i>Malus domestica</i>								
3.1. Red Delicious	Red Delicious	1994	7th	RDC-Yusipang	7.00	Sept-October	2000-2800	Released
3.2. Royal Delicious	Royal Delicious	1994	7th	RDC-Yusipang	7.00	Sept-October	2001-2800	Released
3.3. Golden Delicious	Golden Delicious	1994	7th	RDC-Yusipang	3.70	Sept-October	2002-2800	Released
3.4. Jonathan	Jonathan	1994	7th	RDC-Yusipang	5.00	October	2003-2800	Released
3.5. Rich Red	Rich Red	1994	7th	RDC-Jakar	3.50	August-Sept	2004-2800	Released
3.6. Lobo	Lobo	2002	9th	RDC-Jakar	3.20	Late September	2005-2800	Released
3.7. Red Chief	Red chief	2004	10th	RDC-Yusipang	2.0-3.0	Sept-October	2000-2500	Released
3.8. Red Free	Red Free	2004	10th	RDC-Yusipang	3.80	Mid-August	2000-2500	Released
3.9. Bajo Apple	Anna	2002	9th	RDC-Bajo	2.50	Mid July	1000-1500	Released
3.10. Fuji	Fuji	2007	12th	DSC	5.0-7.0	October	2000-2500	Notified
3.11. Mutsu	Mutsu	2007	12th	DSC	5.0-7.0	Early October	2000-2500	Notified
Apple Root Stock								
3.12. MM 9	MM 9	2006	11th	DSC	Rootstock	Rootstock	>2000	Released
3.13. MM 111	MM 111	2006	11th	DSC	Rootstock	Rootstock	>1200	Released
3.14. MM 106	MM 106	1994	7th	RDC-Yusipang	Rootstock	Rootstock	>2000	Released

3.15. Shekhaichi	Shekhaichi	2018	20th	NSC	5.0-7.0	Sept-October	>2000	Notified
4. APRICOT: <i>Prunus armeniaca</i>								
4.1. Bajo Khamchung 1	Newcastle	2002	9th	RDC-Bajo	2.5-4.8	Mid May	!200-2000	Released
4.2. Shakapara	Shakapara	2002	9th	DSC	3.0-4.0	May	<1800	Notified
4.3. Bajokham-2	July Elberta	2004	10th	RDC-Bajo	3.0-4.0	July	1200-2500	Released
5. AVOCADO: <i>Persea americana</i>								
5.1. Bajo-Gule-1	Bacon	2012	15th	RDC- Bajo	125 kg/tree	October	300-1500	Released
5.2. Bajo-Gule-2	Haas	2012	15th	RDC- Bajo	53 kg/tree	Sept-October	300-1500	Released
6. BANANA: <i>Musa spp.</i>								
6.1. Jaji	Jaji	2002	9th	DSC	5.0-7.0	Sept-April	<1500	Notified
6.2. Gheukola	Gheukola	2002	9th	DSC	5.0-7.0	Sept-April	<1500	Notified
6.3. Chinichampa	Chinichampa	2002	9th	DSC	3.0-5.0	Sept-April	<1500	Notified
6.4. Samtenling Ngangla 1	Grand Naine	2020	22 nd	RDC-Samtenling	3592 hands		<1500	Released
7. CARDAMOM: <i>Amomum subulatum</i>								
7.1. Bharlangey	Bharlangey	2002	9th	RDC-Jakar	0.25-0.35	October-Nov	900-1600	Released
7.2. Golsey	Golsey	2002	9th	RDC-Jakar	0.25-0.35	Sept- October	900-1200	Released
8 CHERRY: <i>Prunus avium</i>								
8.1. Seneca	Seneca	2002	9th	DSC	0.9-1.0	May	1600-2600	Notified
8.2. Royal Ann	Royal Ann	2002	9th	DSC	0.9-1.0	May	1600-2600	Notified
8.3. Jabouney	Jabouney	2002	9th	DSC	1.0-1.72	June	1600-2600	Notified
8.4. Seokham Drukchu	Stella	2015	18th	RDC-Yusipang	1.0-1.02	July	1600-2600	Released
9. DRAGON FRUIT: <i>Hylocereus undatus</i>								
9.1. Gewaringpa 1	<i>Hylocereus undatus</i>	2017	19th	RDC-Wengkhar	20 kg/tree	July-October	300-1500	Released
10. GOOSEBERRY: <i>Ribesuva crispa</i>								
10.1. Bajo Amla	Chakiya	2010	13th	RDC-Bajo	NA	October	400-1500	Notified
11 GRAPES: <i>Vitis vinifera</i>								
11.1. Muscate of Alexandria	Muscate of Alexandria	2004	10th	RDC-Bajo	3.00	August	500-1800	Released

11.2. Perlette	Perlette	2004	10th	RDC-Bajo	1.00	June	500-1800	Released
12. GROUND APPLE: <i>Smallanthus sonchifolius</i>								
12.1. Yacon	Yusi Yacon-1	2019	21st	RDC-Yusipang	6.2kg/plant	Jan-February	900-2500	Released
13. GUAVA: <i>Psidium guajava</i>								
13.1. Bebsew Shakha	Pink Flesh	2010	13th	RDC-Bajo	15-20 kg/tree	May-October	250 - 1300	Released
13.2. Bajo Bebsew	Local	2010	13th	RDC-Bajo	10-15 kg/tree	May-October	250 - 1300	Released
14. KIWI: <i>Actinidia deliciosa</i>								
14.1. Zhimpeykotong Sep	Yellow Joy	2015	18th	RDC-Wengkhar	4.0-6.0	October	1200-2300	Released
14.2. Zhimpeykotong Jangkha	Wengkhar Green	2015	18th	RDC-Wengkhar	4.0-6.0	Oct-November	1200-2300	Released
14.3. Zhimpeykotong Phosing	Male_plant	2015	18th	RDC-Wengkhar	Male plant	Male plant	1200-2300	Released
14.4. Enza Red	Enza Red	2019	2st	RDC-Wengkhar	5 to 18 kg/tree	Oct-November	1200	Released
14.5. Hayward	Hayward	2019	21st	RDC-Wengkhar	5 to 18 kg/tree	Oct-November	1200	Released
15. LIME: <i>Citrus latifolia</i>								
15.1. Bearrs	Swingle	2004	10th	RDC-Bajo	1.0-2.0	Aug-January	500-1500	Released
16. LITCHI: <i>Litchi chinensis</i>								
16.1. Bhur Selection 1	Bhur Selection 1	2004	10th	DSC	9.0-10.0	June-July	<1200	Notified
16.2. Shahi	Shahi	2006	11th	DSC	10.0-12.0	Late June	<1200	Notified
16.3. Early Bedana	Early Bedana	2006	11th	DSC	8.0-9.0	Early June	<1200	Notified
16.4. Bhur Litchi 1	Muzaffarpur	2012	15th	RDC-Samtenling	70 kg/tree	February-May	200-700	Released
16.5. Bhur Litchi 2	Bedana	2012	15th	RDC-Samtenling	65 kg/tree	February-May	200-700	Released
17. MANDARIN/ORANGE: <i>Citrus reticulata</i>								
17.1. Dorokha Selection	Dorokha Selection	2004	10th	DSC	4.0-5.0	Oct-December	700-1700	Notified
17.2. Wengkhar Tshelu 1	Wengkhar Tshelu 1	2007	12th	RDC-Wengkhar	35 kg/tree	Mid November	1300-1700	Released
17.3. Wengkhar Tshelu 2	Wengkhar Tshelu 2	2007	12th	RDC-Wengkhar	27 kg/tree	Mid November	1300-1700	Released

17.4. Wengkhar Tselu Drukchu	Clemintina Nules	2015	18th	RDC-Wengkhar	37 kg/tree	December	1200-1500	Released
17.5. Wengkhar Tshelu Ngarm	Tarku	2015	18th	RDC-Wengkhar	41 kg/tree	January	800-1300	Released
Mandarin Rootstock								
17.6. Rangpur Lime	Rangpur Lime	2004	10th	RDC-Wengkhar	Rootstock	Rootstock	800-1200	Released
17.7. Wengkhar Tshelu Rato 1	Trifoliolate orange	2006	11th	RDC-Wengkhar	Rootstock	Rootstock	800-1600	Released
17.8. Carrizo citrange	Carrizo citrange	2006	11th	DSC	Rootstock	Rootstock	800-1800	Released
17.9. Troyer citrange	Troyer citrange	2006	11th	DSC	Rootstock	Rootstock	800-1800	Released
17.10. Cleopatra mandarin	Cleopatra mandarin	2006	11th	DSC	Rootstock	Rootstock	800-1800	Released
18. MANGO: <i>Mangifera indica</i>								
18.1. Chausa	Chausa	2002	9th	DSC	4.0-6.0	August	<1500	Notified
18.2. Bajo Aumchukuli 1	Dashahari	2010	13th	RDC-Bajo	3.0-4.0	July-August	280-800	Released
18.3. Bajo Aumchukuli 2	Langra	2010	13th	RDC-Bajo	12-15 kg/tree	Mid March-August	250-800	Released
18.4. Bajo Aumchukuli 3	Amrapali	2010	13th	RDC-Bajo	12-15 kg/tree	Late July	250-800	Released
18.5. Samtenling Amchukuli-1	Chinwang	2019	21st	RDC-Samtenling	81.35kg/tree	July	150-1100	Released
18.6. Samtenling Amchukuli-2	Duncan	2019	21st	RDC-Samtenling	69.03kg/tree	July	150-1100	Released
18.7. Samtenling Amchukuli-3	Irwin	2019	21st	RDC-Samtenling	24.96kg/tree	July	150-1200	Released
18.8. Samtenling Amchukuli-4	Tommy Atkin	2019	21st	RDC-Samtenling	60.31kg/tree	July	150-1100	Released
19. MUSKMELON: <i>Cucumis melo</i>								
19.1. Honey Dew	Honey Dew	1990	3rd	RDC-Bajo	2.0-4.0	90-110 DAS	600-1500	Released
20. PASSION FRUIT: <i>Passiflora edulis</i>								
20.1. Local	Local	2004	10th	DSC	1.0-2.0	May-June	<1500	Notified
21. PEACH: <i>Prunus persica</i>								
21.1. Bajokham 1	Flordasum	2002	9th	RDC-Bajo	3.0-4.0	Mid May	1000-2000	Released

21.2. Nonomiwase	Nonomiwase	2002	9th	DSC	5.9-8.0	June-July	>1500	Notified
21.3. Bajokham 2	July Elberta	2004	10th	RDC-Bajo	2.9-3.7	July	1200-2500	Released
21.4. Bathpala Super	Bathpala Super	2004	10th	RDC-Jakar	4.0-6.0	July-August	2000-2600	Released
22. PECAN NUT: <i>Carya illinoensis</i>								
22.1. Bajo Thasa Taago-1	Western Schley	2019	21st	RDC-Bajo	8 Kg/tree	Oct-November	900-1700	Released
22.2. Bajo Thasa Taago-2	Whichita	2019	21st	RDC-Bajo	10 kg/tree	Oct-November	900-1700	Released
23. PEAR: <i>Pyrus communis</i>								
23.1. Hosui	Hosui	2002	9th	DSC	6.0-7.0	Mid August	1500-2200	Notified
23.2. Kosui	Kosui	2002	9th	DSC	5.0-6.0	July-Early August	1500-2000	Notified
23.3. Bajo Lhee 1	Flemish beauty	2004	10th	RDC-Bajo	2.0-3.0	August	1300-2500	Released
23.4. Zhey Lhee	Zhey Lhee	2004	10th	RDC-Jakar	4.8-5.5	Early October	<2000	Notified
23.5. Wengkhar Lhee 1	Chojuro	2010	13th	RDC-Wengkhar	10.00	August	1500 to 2200	Released
23.6. Wengkhar Lhee 2	Shinko	2012	15th	RDC-Wengkhar	59 kg/tree	August end	1500 to 2200	Released
23.7. Yusipang Lhee-1	Niitaka	2018	20th	RDC-Samtenling	39 kg/tree	August	1700 - 2600	Released
23.8. Yusipang Lhee-2	Hakuri	2018	20th	RDC-Samtenling	39.05 kg/tree	August	1700 - 2600	Released
23.9. William	William	2018	20th	NSC	35 kg/tree	August	1700 - 2500	Notified
24. PERSIMMON: <i>Diospyros kaki</i>								
24.1. Fuyu	Fuyu	2004	10th	DSC	3.0-4.0	Mid November	1000-1650	Notified
24.2. Jiro	Jiro	2004	10th	DSC	3.0-4.0	Early October	1000-1650	Notified
24.3. Wengkhar Anday 1	Wengkhar Anday 1	2007	12th	RDC-Wengkhar	2.0-3.0	Mid-September	1500-2300	Released
25. PLUM: <i>Prunus domestica</i>								
25.1. Santa Rosa	Santa Rosa	2002	9th	DSC	3.0-5.0	May-June	>1700	Notified
25.2. Oishiwase	Oishiwase	2002	9th	DSC	5.0-6.0	May-June	>1700	Notified
25.3. Jambay Lhaxhang Chuli	Jambay Lhaxhang Chuli	2004	10th	RDC-Jakar	4.0-5.0	July-August	2000-2600	Notified
25.4. Soldum	Soldum	2012	15th	RDC-Wengkhar	45 kg/tree	Last week of June	1600-2500	Released
25.5. Yusi Prune 1	Stanley	2020	22 nd	RDC-Yusipang	5.0-6.5.	Mid Sept-October	>1700	Released

26. POMEGRANATE: <i>Punica granatum</i>								
26.1. Bedana	Bedana	2004	10th	DSC	2.5-4.0	Late August	<1500	Notified
26.2. Bajo Seindu 1	Khandari	2010	13th	RDC-Bajo	26.7 kg/tree	April-August	400-1500	Released
27. PINEAPPLE: <i>Ananas comosus</i>								
27.1. Spineless	Spineless	2018	20th	RDC-Wengkhar	19 kg/tree	July-August	1500	Notified
27.2. Samtenling kongtsey 1		2020	22 nd	RDC-Yusipang	19.4	August	<1500	Released
27.3. Samtenling kongtsey 2		2020	22 nd	RDC-Yusipang	6.8	June-July	<1500	Released
28. STRAWBERRY: <i>Fragaria ananassa</i>								
28.1. Yusi Sagong 1	Chandler	2006	11th	RDC-Yusipang	0.7	May-June	1500-2500	Released
28.2. Pangtshalu Ngarm	Sweet Charlie	2014	17th	RDC-Yusipang	1.37	May	1800-2600	Released
28.3. Pangtshalu Maap	Camarosa	2014	17th	RDC-Yusipang	0.63	June	1800-2600	Released
29. WALNUT: <i>Juglans regia</i>								
29.1. Kagzi	Kagzi	2002	9th	DSC	0.5-1.5	Sept – October	1400-2800	Notified
29.2. Kanthel	Kanthel	2004	10th	RDC-Yusipang	1.0-1.5	September	1400-2800	Released
29.3. Yusipang 2	Yusipang 2	2004	10th	RDC-Yusipang	0.5-1.0	September	1400-2800	Released
30. WATERMELON: <i>Citrullus lanatus</i>								
30.1 Sugar Baby	Sugar Baby	2018	20th	NSC	15-20	75 DAS	<1500	Notified

Table 8. Released tea varieties in Bhutan (2020)

Variety	Variety/Breeding line (s)	Year of Release	Releasing Committee	Releasing Agency	Yield Potential (t/ac or kg/tree)	Maturity / Harvesting Time	Recommended Agro-ecology (MASL)	Remarks
2. Tea: <i>Camellia Sinensis</i>								
2.1. Sam Ja 1	Samcholing Indigenous	2020	22 nd	RDC-Samtenling	0.54	March-Oct	150-1800	Released
2.2. Sam Ja 2	Prince Namgay Wangchuck	2020	22 nd	RDC-Samtenling	0.58	March-Oct	150-1800	Released

Table 8. Released vegetables in Bhutan (1988-2020)

Variety	Variety/Breeding line (s)	Year of release	Releasing Committee	Releasing Agency	Yield Potential (t/ac)	Maturity (DAS)	Recommended Agro-ecology (MASL)	Remarks
1. ASPARAGUS: <i>Asparagus officinalis</i>								
1.1. Merry Washington	Merry Washington	2002	9th	DSC	1.1-1.5	3 years	1000-2500	Notified
1.2. UC-157	UC-157 (Hybrid)	2006	11th	DSC	1.0-2.0	2-3 yrs	1000-2600	Released
2. BEANS: <i>Phaseolus vulgaris</i>								
2.1. Borloto	Borloto	1990	3rd	RDC-Bajo	2.0-4.0	65-70	<1500	Released
2.2. Pusa parvati	Pusa parvati	1990	3rd	RDC-Bajo	2.5-3.5	50-60	<1500	Released
2.3. Top Crop	Top Crop	1990	3rd	RDC-Bajo	1.0-2.0	70-85	<1500	Released
2.4. Rajma	Rajma	1994	7th	RDC-Bajo	2.50	80-90	700-2000	Released
2.5. Green arrow	Green arrow	1999	8th	RDC-Bajo	2.00	60	700-2000	Released
2.6. Lingmethang Mung 1	KPS2	2002	9th	RDC-Wengkhar	0.30	120-130	800-1200	Released
2.7. Lingmethang Mung 2	Barimung	2002	9th	RDC-Wengkhar	0.30	120-130	800-1200	Released
2.8. White No. 1	White No 1	2004	10th	RDC-Bajo	1.5-2.5	70-80	700-1500	Notified
2.9. Selection 9	Selection 9	2004	10th	RDC-Bajo	1.5-3.0	70-80	<2200	Notified
2.10. Wengkhar Semchu 1	Grey pole	2019	21 st	RDC-Wengkhar	3.4	70-80	<2400	Released
2.11. Bajo Semchum 1-P	Prime Green	2020	22 nd	RDC-Bajo	7.3	50-55	<3000	Released
3. BEETROOT: <i>Beta vulgaris</i>								
3.1. DDR	DDR	2004	10th	DSC	4.0-5.0	70-80	<2500	Notified
4. BOTTLE GOURD: <i>Lagenaria siceraria</i>								
4.1. Mindapur round	Mindapur round	1999	8th	RDC-Bajo	6.0-7.0	85-95	<1500	Released
5. BRINJAL: <i>Solanum melongena</i>								
5.1. Paro Local	Paro Local	1990	3rd	NASEPP	1.0-2.0	90-100	<2600	Released

5.2. Big Round	Big Round	1990	3rd	NASEPP	2.0-4.0	75-90	600-1500	Released
5.3. Pusa Purple Long	Pusa Purple Long	1990	3rd	RDC-Bajo	2.0-3.0	90-110	600-1500	Released
6. BROCCOLI: <i>Brassica oleracea</i>								
6.1. Dessico	Dessico	1994	7th	RDC-Bajo	0.8-1.0	100-110	600-2600	Released
7. BULB ONION: <i>Allium cepa</i>								
7.1. Senshu Red	Senshu Red	1994	7th	NASEPP	7.00	120-170	<2600	Released
7.2. White Creole	White Creole	2002	9th	DSC	5.0-7.0	120-160	<2600	Released
7.3. Bombay Red	Bombay Red	2002	9th	DSC	4.0-6.0	110-160	<2200	Notified
7.4. Bajo Gop 1	Red Creole	2002	9th	RDC-Bajo	7.0-8.0	120-140	<2200	Released
7.5. Pune Red	Pune Red	2018	20th	NSC	4.0-6.0	110-120	<1800	Notified
8. BUNCHING ONION: <i>Allium fistulosum</i>								
8.1. No. 21	No. 21	2002	9th	DSC	1.0-3.0	80-90	<2600	Notified
8.2. No. 22	No. 22	2002	9th	DSC	1.0-3.0	80-90	<2600	Notified
9. CABBAGE: <i>Brassica oleracea (capitata)</i>								
9.1. Copenhagen Market	Copenhagen Market	1990	3rd	RDC-Bajo	9.0-10.0	75-85	<2600	Released
9.2. Golden Acre	Golden Acre	1990	3rd	RDC-Bajo	9.0-10.0	75-85	<2600	Released
9.3. Green Coronate	Green Coronate (Hybrid)	2006	11th	DSC	12.0-13.0	80-90	Across all AEZ	Released
9.4. Gianty	Gianty (Hybrid)	2006	11th	DSC	11.0-12.0	70-80	Across all AEZ	Released
9.5. T1-163	T1-163 (Hybrid)	2006	11th	DSC	10.0-11.0	65-75	Across all AEZ	Released
9.6. Bonday Cross	Bonday Cross (Hybrid)	2006	11th	DSC	10.0-11.0	90-110	Across all AEZ	Released
9.7. Lucky Ball	Lucky Ball	2007	12th	DSC	9.0-10.0	80-100	Across all AEZ	Released
9.8. Asha	Asha	2019	21st	RDC-Wengkhar	7.6	70-80	1800-2100	Notified
9.9. Bengal King	Bengal king	2019	21st	RDC-Wengkhar	11.4	70-80	1800-2100	Notified
10. CAPSICUM: <i>Capsicum annuum</i>								
10.1 California Wonder	California Wonder	1990	3rd	RDC-Bajo	4.0-5.0	75-80	700-2000	Released

11. CHILLI: <i>Capsicum annum</i>								
11.1. Sha Ema	Sha Ema	1990	3rd	DSC	15.0-20.0	90-100	600-2000	Released
11.2. Super Solo	Super solo	2004	10th	RDC-Wengkhar	19.00	90-100	700 to 2500	Released
11.3. Yangtse Ema	Yangtse Ema	2007	12th	RDC-Wengkhar	4.0-6.0	90-100	1000-2000	Released
11.4. Indian Chilli	IR-8	2018	20th	NSC		100-120	1000-1500	Notified
12. CARROT: <i>Daucus carota</i>								
12.1. Early Nantes	Early Nantes	1990	3rd	RDC-Bajo	4.0-6.0	80-90	600-2600	Released
12.2. Nisa	Nisa	2002	9th	DSC	4.0-6.0	90-100	<2000	Notified
12.3. Wengkhar Lhaphu Maap	Khuruda 5	2006	11th	RDC-Wengkhar	14.00	105	600 to 2500	Released
12.4. New Khuruda	New Khuruda	2006	11th	DSC	8.0-9.0	100-110	<2000	Released
12.5. All Seasons Cross	All Seasons Cross	2006	11th	DSC	8.9-10.0	110-120	<2200	Released
13. CAULIFLOWER: <i>Brassica oleracea</i>								
13.1. White Top	White Top	1990	3rd	RDC-Bajo	10.0-15.0	100	1000-2600	Released
13.2. White Summer	White Summer	1990	3rd	RDC-Bajo	10.0-12.0	90-100	1500-2000	Released
13.3. Wengkhar Metokopi 1	Wengkhar Early	2004	10th	RDC-Wengkhar	7.0-8.0	90	600-2500	Released
13.4. Wengkhar Metokopi 2	Wengkhar Late	2004	10th	RDC-Wengkhar	10.0-12.0	120	600-2500	Released
13.5. White Express 50	White Express 50	2019	21st	RDC-Wengkhar	3.3	90	1400-1800	Notified
13.6. Pragati 40	Pragati 40	2019	21st	RDC-Wengkhar	2.5	90	1400-1800	Notified
13.7. Suhasini	Suhasini (hybrid)	2020		RDC-Yusipang	6.0-8.0	80 DAT	<2600	Notified
13.8. Candid Charm	Candid Charm (hybrid)	2020		RDC-Yusipang	6.0-8.0	140-150	<2600	Notified
14. CELERY: <i>Apium graveolens</i>								
14.1. Cornel	Cornel	2002	9th	DSC	5.0-6.0	120-160	<2600	Notified
15. CHINESE CABBAGE: <i>Brassica rapa subsp. Pekinensis</i>								
15.1. Kyoto 1	Kyoto 1	1990	3rd	RDC-Bajo	12.0-16.0	60-85	1500-2200	Released
16. CUCUMBER: <i>Cucumis sativus</i>								
16.1. Shabi Genchu	Shabi Genchu	1990	3rd	NASEPP	1.2-2.0	70-80	<2400	Released

16.2. Bajo Genchu 1	Bajo Genchu 1	1999	3rd	RDC-Bajo	2.0-4.0	70-85	<2000	Released
16.3. Santon No 1	Santon No 1	2018	20th	NSC	2.0-4.0	70-80	<2500	Notified
17. CORIANDER: <i>Coriandrum sativum</i> L								
17.1. Local	Local	2018	20th	NSC	.04-0.6	80-90	AEZ	Notified
18. GARLIC: <i>Allium sativum</i>								
18.1. Local Selection	Local Selection	1990	3rd	NASEPP	4.0-6.0	230-250	<2000	Released
19. JAPANESE GREEN: <i>Brassica spp.</i>								
19.1. Taisai	Taisai	1990	3rd	NASEPP/DSC	3.0-4.0	40-50	<2600	Released
19.2. Mibuna	Mibuna	1990	3rd	NASEPP/DSC	3.0-4.0	50-60	<2600	Released
20. LADY FINGER: <i>Abelmoschus esculentus</i>								
20.1. Kranti	Kranti	2002	9th	DSC	3.0-5.0	70-80	600-1500	Notified
21. LETTUCE: <i>Lactuca sativa</i>								
21.1. Great Lake	Great Lake	1990	3rd	NASEPP	3.0-4.0	70-80	<2600	Released
21.2. Hogay Petshey Leedo	Biscia Rosa	2014	17th	RDC-Yusipang	11.84	90-100	Temperate	Released
21.3. Hogay Petshey Thigthra	Flashy Trout	2014	17th	RDC-Yusipang	14.8	90-100	Temperate	Released
21.4. Hogay Petshey Hyem	Green Oak Leaf	2014	17th	RDC-Yusipang	7.20	90-100	Temperate	Released
21.5. Hogay Petshey Oro	Blush Butter Oak	2014	17th	RDC-Yusipang	6.80	90-100	Temperate	Released
22. MUSTARD GREEN: <i>Brassica juncea</i>								
22.1. Him Beauty	Him Beauty	1990	3rd	NASEPP/DSC	2.5-4.0	50-60	1200-2600	Released
22.2. Takana Red	Takana Red	1990	3rd	NASEPP/DSC	2.0-3.0	50-60	1200-2600	Released
22.3. Taisai	Taisai	1990	3rd	NASEPP	2.0-3.0	60-70	1500-2600	Released
22.4. Neguna	Neguna	1990	3rd	NASEPP	2.0-3.5	60-70	1200-2600	Released
22.5. Wengkhar Petshey 1	Wengkhar Peytse 1	2004	10th	RDC Wengkhar	3.5-4.0	100-120	600-2600	Released
22.6. Wengkhar Petshey 2	Wengkhar Peytse 2	2004	10th	RDC Wengkhar	3.5-4.0	100-120	600-2600	Released

23. PARSLEY: <i>Petroselinum crispum</i>								
23.1. Paramount	Paramount	1990	3rd	NASEPP	2.5-3.5	130-160	<2200	Released
24. PEA: <i>Pisum sativum</i>								
24.1. Arkel	Arkel	2002	9th	DSC	1.0-2.0	65-75	All AEZ	Notified
24.2. Usui	Usui	2002	9th	DSC	2.0-3.0	90-100	>1800	Notified
24.3. Mr Big	Mr. Big	2018	20th	NSC	3.0-3.5	90-100	>1800	Notified
25. POTATO: <i>Solanum tuberosum</i>								
25.1. Desiree	CIP 800048	1988	1st	BNPP	15.0-18.0	90	1000-2000	Released
25.2. Khangma Kewa Kaap	CIP 378015.13	2002	9th	RDC-Wengkhar	16.0-20.0	100-105	600-2500	Released
25.3. Nasephey Kewa Kaap	CIP-393077.159	2014	17th	National Potato Program	39-45	160-180	Across all AEZ	Released
25.4. Yusi Maap	CIP 392797.22	2017	19th	RDC-Yusipang	11.6-17.2	120-140	Mid-High Altitude	Released
26. PUMPKIN: <i>Cucurbita maxima</i>								
26.1. Ramthang Brumsha	Ramthang Brumsha	1990	3rd	NASEPP	2.0-4.0	100-140	<1200	Released
26.2. Tetsu Kabuta	Tetsu Kabuta	1990	3rd	NASEPP	2.0-3.0	90-100	<1500	Released
26.3. Summer Squash	Summer Squash	1994	7th	NASEPP	1.0-2.0	90-100	<2400	Released
26.4. Wengkhar Kakur	Wengkhar Kakur	2007	12th	RDC-Wengkhar	1.0-2.0	90-100	<1700	Released
27. RADISH: <i>Raphanus sativus</i>								
27.1. Minowase	Minowase	1990	3rd	NASEPP	8.0-10.0	50-80	<2600	Released
27.2. Spring Tokinashi	Spring Tokinashi	1990	3rd	NASEPP	9.0-10.0	50-60	<2000	Released
27.3. Bajo Laphu 1	Hongkong White	2002	9th	RDC-Bajo	12.0-20.0	45	<1500	Released
27.4. 35 days	35 days	2018	20th	NSC	9.0-10.0	35	<2000	Notified
27.5. YR White Spring	YR White Spring (hybrid)	2020		RDC-Yusipang	7.0-10.0	50-65	<2600	Notified
28. SPINACH: <i>Spinacia oleracea</i>								
28.1. All Green	All Green	1990	3rd	RDC-Bajo	4.0-10.0	50 -60	<1500	Released
28.2. Leaf Beet	Leaf Beet	2002	9th	DSC	4.0-10.0	50-70	<1800	Notified

29. SUMMER SQUASH: <i>Cucurbita pepo</i>								
29.1. Zucchini	Zucchini Green	1994	7th	NASEPP	6.0-8.0	60-65	<1200	Released
30. TOMATO: <i>Solanum lycopersicum</i>								
30.1. Roma	Roma	1990	3rd	RDC-Bajo	4.0-6.0	90-150	<1500	Released
30.2. Nozomi	Nozomi	1990	3rd	RDC-Bajo	4.5-6.0	90-100	1000-2200	Released
30.3. Cherry Tomato	CHT160	1999	3rd	RDC-Bajo	8.0-12.0	60-70	1300-1800	Released
30.4. Bajo Lambenda 1	Rattan	2002	9th	RDC-Bajo	8-12.0	80-100	300-2600	Released
30.5. Cosmic	Cosmic (hybrid)	2020		RDC-Yusipang	25.0-35.0	140	2000-2700	Notified
30.6. Garv	Garv (hybrid)	2020		RDC-Santenling	30.0-35.0	75 DAT	<1500	Notified
31. TURNIP: <i>Brassica rapa</i>								
30.1. PTWG	Purple Top White Globe	1990	3rd	NASEPP	8.0-12.0	60-70	>1000	Released

Table 9. De-notified crop varieties in Bhutan

Sl. No.	Crop	Variety	Proposing Agency	Released Year	De-notified year
A Cereals					
1	Rice	1.1. Milyang 54	RDC-Bajo	1989	2002
		1.2. Barket	RDC-Bajo	1892	2002
		1.3. BW 293	RDC-Bajo	1990	2010
2	Mustard	2.1. T-9	RDC-Bajo	1989	2002
3	Wheat	3.1. Sonalika	RDC-Bajo	1970	2014
		3.2. Bajo Kaa 1	RDC-Bajo	1991	2015
		3.3. Bajo Kaa 2	RDC-Bajo	1994	2015
4	Maize	4.1. Khangma Ashom 1	RDC-Wengkhar	1999	2015
		4.2. Khangma Ashom 2	RDC-Wengkhar	1999	2015
B Vegetables					
1	Beans	1.1. Brothbone	DSC	1990	2002
		1.2. Kentucky Wonder	DSC	1990	2002
		1.3. Long John	RDC- Bajo	1994	2002
2	Bulb onion	2.1. Senshu Yellow	DSC	1990	2002
		2.2. Nasik Red	DSC	1994	2002
3	Cabbage	3.1. Baldura	RDC-Bajo	1990	2002
		3.2. Pride of India	RDC-Bajo	1990	2002
4	Carrot	4.1. Chantaney Improved	DSC	1990	2002
5	Cauliflower	5.1. Snow Ball 16	DSC	1994	2002
		5.2. Progress	DSC	1994	2002
		5.3. 19907	DSC	2002	2004
6	Celery	6.1. Short Lake	DSC	1990	2002
7	Chilli	7.1. Hot Wax	RDC-Bajo	1990	2002
8	Cucumber	8.1. Shanton No. 1	DSC	1990	2002

9	Lady finger	9.1. Blue Bell	RDC-Bajo	1994	2002
		9.2. Pusa Sawani	RDC-Bajo	1994	2002
10	Lettuce	10.1. Sunny	DSC	1994	2002
11	Pea	11.1. Snow Pea	RDC-Bajo	1990	2002
		11.2. JI 1050	RDC-Bajo	1990	2002
12	Potato	12.1. Kufri Jyoti	RDC-Yusipang	1988	2014
		12.2. Yusi Kaap	RDC-Yusipang	1988	2014
13	Pumpkin	13.1. Utsuki red	DSC	1990	2002
14	Radish	14.1. Mihaysiga	DSC	1990	2002
		14.2. Shogum	DSC	1990	2002
15	Tomato	15.1. Fusa 3	DSC	1990	2002
		15.2. Helfrush	DSC	1990	2002
16	Welsh onion	16.1. Kujo	DSC	1990	2002
C	Fruits				
1	Water melon	1.1. Asahi Yamato	DSC	1990	2002