

Original Research Article

Phenological and flowering features of four exotic apple cultivars on M9T337 rootstock under high density plantation in North Himalayan region of India

ABSTRACT

This study was conducted to define the phenological and of flowering characteristics of four apple cultivars grafted on M9T337 rootstock and cultivated in the Experimental Orchard of Division of Fruit Science, Sher-e-Kashmir University of Agricultural Science & Technology of Kashmir, Shalimar, Srinagar, Jammu & Kashmir during the year 2014. In the study it were recorded, days to bud break, silver tip stage, green tip stage, leafing out, pink bud, initial bloom, and final bloom, duration of flowering and days to petal fall of apple cultivars viz. Super Chief Sandidge, Gala Red Lum, Fuji Zhen Aztec and Golden Clone B, were recorded. The results reveal that various phenological stages viz. bud break, green tip, silver tip and leaf initiation showed significant differences for the different cultivars. During the study, cultivar Cv. Gala Red Lum took minimum number of days to for starting attain bud break (15.27 days after reference date) and, silver tip stage (20.20 DARD), while as 'Golden Clone B' was the last to attain these different phenological stages. Full bloom was earliest (52.29 DARD) in on 'Gala Red Lum' and was later (58.79 DARD) in on 'Golden Clone B'. The duration of flowering ranged from 12.28 days in on 'Super Chief Sandidge' to 13.69 days in on 'Golden Clone B'. Remarkable variations were thus observed in the phenological and flowering behaviour of the investigated varieties under temperate

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23 **conditions of Jammu and Kashmir.**

24 **Key words:** Apple varieties, phenological [data](#), flowering, high density, temperate climate

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26 INTRODUCTION:

27 Jammu and Kashmir States, as being endowed with natural advantages of topography
28 and climate with enormous diversity of agro-climatic conditions, has immense scope for
29 horticultural development. Horticulture industry in the State made rapid strides during the last
30 few decades. Compared to 1954-1955, the area under fruits in the State has increased by 16
31 times and the production has shoot up to 60 times. Among the temperate fruits, apple ranks
32 first, covering 43.30 per cent in area and 80.18 per cent for production. Productivity of apple has
33 shown an increase from 4.12 to 10.60 MT/ha from 1975 to 2017. Though it appears to be the
highestprincipal
34 among the apple producing States in the country, yet it is far below the level achieved by

35 horticulturally advanced countries where productivity is in between 50-60 MT/ha [1].

36 Almost entire apple plantation in the State is on seedling rootstocks. The excessive
37 vigorous seedling of this type of rootstock leads to larger trees, which and have long juvenility.
Also (There is more
38 competition between vegetative growth and fruit production within these king of trees and their
39 internal self-shading makes them more vulnerable to various diseases. By When using vigorous
40 rootstocks, only few trees can be accommodated per hectare, making the productivity less
41 profitable. With stagnation in productivity, looming threat of imported fruits and land prices
42 touching new peaks in the State, it becomes imperative to invest ongo for high-density
43 which changing rootstock from vigorous to size controlling (dwarfing) rootstocks is a
prerequisite.
44 Orchards with new cultivars and on dwarfing rootstocks are also few in the State. The
45 number of orchard with new cultivars and grafted on dwarf and semi-dwarf clonal rootstocks
should be

46 increased in order to increase yield and fruit quality, as these rootstocks are more effective.
Therefore, it is necessary to determine

47 suitable cultivars for the region. Otherwise apple shows gametophytic self and cross-

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Comment [FD6]: The main reasons of low profitability when using this king of rootstocks are the low precocity of bearing associated with low productivity and small fruit size.

Comment [FD7]: What do you mean for 'suitable' cultivares ? More productive, better fruit quality, better adapted to the climate. ?

Comment [FD8]: This issue was not an objective of this study. So, in my opinion this sentence should be discarded.

48 incompatibility, showing that at least two genetically distinct cultivars are necessary for stable
apple
49 production. SKUAST-K has recently introduced new apple cultivars from outside the country
50 which are raised were grafted on the dwarfing clonal rootstock M9T337, and are a suitable
combination for high density

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51 plantation. However their features on flowering phenological ~~and flowering features~~ under
temperate conditions of

52 Kashmir remain to be studied. Thus this study was conducted to fill this gap.

53 MATERIALS AND METHODS

54 The study was conducted in the Experimental ~~orchards~~ Orchards of Division of Fruit Science,
Sher-

55 e-Kashmir University of Agricultural Science & Technology of Kashmir, Srinagar, Jammu &

56 Kashmir, during the year 2014 (~~figure~~ Figure 1). The orchard ~~was established~~ is located at a mean of
an altitude of 1500 meters

57 above ~~mean~~ sea level. The climate is cold temperate. Rainfall is about 80cm, well distributed,

58 ~~and is~~ mostly in the form of snow during winter ~~with the~~ and main rainfall ~~is~~ during March-April.
The

59 ~~uniform~~ Uniform plants of four exotic cultivars of apple viz. Super Chief Sandidge, Gala Red
Lum,

60 Fuji Zhen Aztec and Golden Clone B ~~raised-grafted~~ on M9T337 rootstock ~~at a spacing of~~
3x1.5m

61 ~~that~~ were introduced by SKUAST-Kashmir in spring 2013 from ~~an the~~ Italian nursery, GRIBA,

62 ~~Italy. The~~ were selected trees for this study ~~were planted at a spacing of 3 m x 1.5 m in the~~
orchard. The experiment was laid in Randomized Complete Block

63 Design (RCBD) with five replications and two trees per treatment as plot size. For this study it
was recorded the following Various

64 phenological characteristics: (days to bud break, silver tip stage, green tip stage and leafing

65 ~~out) were~~ recorded visually by observing peculiar stages of each respective parameter (figure
Figure 2).

66 Flowering stages including initial bloom and final bloom in each variety was recorded when

67 10 and 80 per cent of the flowers had opened, respectively (figure Figure 3). The duration period
from the date of flowering initiation of

68 flowering to the date of start of petal fall was calculated as duration of flowering. The date of

69 ~~occurrence of~~ for petal fall was recorded when 80% of petals were fallen ~~occurred~~. The dates
thus recorded

70 were converted to days from with respect to days after reference date (DARD), 1st of March,

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7170 The data recorded during the course of investigation were subjected to statistical analysis

7271 ~~as per the~~ using the method of 'Analysis of Variance' [6]. The significance and non-significance
of

7372 treatment effects were judged with the help of software OPSTAT. The significant differences

7473 ~~on of~~ the means ~~was were~~ tested against the critical difference at 5% level.

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75 RESULTS AND DISCUSSION

76 ~~Various~~ Most of the phenological stages viz. bud break, green tip, silver tip and leaf initiation,

77 showed significant differences during the study (Table 1). The ~~Cv. cultivar~~ Gala Red Lum took
78 minimum number of days to attain bud break (15.27 DARD), silver tip stage (20.20 DARD),

79 green tip stage (23.57 DARD) and leaf initiation (29.48 DARD), while ~~as~~ 'Golden Clone B' was

80 the last to attain these different phenological stages i.e. bud break at 21.50 DARD, silver tip at 25.49

81 DARD, green tip at 28.36 DARD and leaf initiation at 36.66 DARD. The cv. Fuji Zhen Aztec
also showed longer DARD then cv. Gala Red Lum, ~~the results being are in accordance line~~

82 with the findings of (Baytekin, (2006)2), who stated that dates of bud break ~~in for~~ 'Fuji'/'M9' were
later than ~~for~~

83 'Gala'/'M9'.

84 Remarkable variations were observed in the flowering behaviour of the different

85 cultivars from the ~~date of~~ pink bud to complete petal fall (Table 2). Pink bud stage was first

86 noticed after 39.44 ~~days DARD of reference date for in cultivar~~, Gala Red Lum followed by cv.
Super Chief

87 Sandidge, that took 40.68 ~~days DARD. The last was 'Golden Clone B' with and last~~ (44.86
DARD ~~to get pink buds~~) in the cultivar Golden Clone B.

88 Likewise, ~~date of~~ initial bloom was ~~attained~~ first (44.41 DARD) ~~by on~~ cultivar Gala Red Lum,

89 while 'Golden Clone B' reached at this stage ~~very much~~ later (48.46 DARD). Full bloom stage
was

90 observed first (52.29 DARD) ~~on in cultivar~~ Gala Red Lum and ~~again much very~~ later (58.79
DARD) ~~mon~~

91 'Golden Clone B'. The differences in the phenological stages of different cultivars, ~~certainty~~, are
~~may be~~ due

92 to ~~their genetic differences or~~ the differential chilling requirements of these varieties. Further,

93 these cultivars may be different in their photo sensitivity and response to temperature

94 resulting in these variations. These results are in ~~accordance consequence~~ with the findings of Gasser
(7)

95 who has reported that beginning of blooming depends highly on the site of ~~cultivation~~

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Comment [FD16]: This feature is certainly related to the chilling requirement of the variety. The higher the chilling requirement the higher the DARD. Golden Clone B has more chilling requirement than Gala ...

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Comment [FD18]: In fact the main factor related to this character is the different length of bud winter dormancy (chilling requirement) of the different cultivars.

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96 Beginning of bloom can be observed with higherst accuracy which indicates the genetic
97 differences among varieties. Bodor and Toth (4) reported that high spring temperature causes
98 shorter blooming period and main bloom takes only few days for the whole cultivar
99 assortment. Soltesz, (10) investigated the stability of the blooming order of 86 varieties in the

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Comment [FD20]: This is only true for apple variety full satisfied on winter chilling.

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100 ease of 86 varieties for 20 years and pointed out that beginning of blooming never shows
101 the same trend even under similar circumstances.

102 The petal fall was observed/recorded first of all on in the cultivar Gala Red Lum (60.64 DARD)

103 and last in on 'Golden Clone B' (66.24 DARD). Usually these differential results may be due to the

104 different level of satisfaction of the buds on chilling requirements of temperature and average temperature during bloom period. These

105 results are in conformity with the findings of Facticeau *et al.* (5) who reported that beginning of
106 flowering, full bloom and end of flowering were different for the different cultivars under study. Such

107 divergent results might be due to the difference between the temperatures during early stage
108 of vegetative development. Flowering date and period of blooming varies according to cultivar aptitude as

109 well as ecological and cultural conditions [5].

110 Duration of flowering ranged from 12.28 days in for cultivar Super Chief Sandidge to

111 13.69 days in for 'Golden Clone B'. The results are in accordance with the findings of Blazek *et al.*

112 (3) who reported 17 days of flowering in different apple cultivars. Kumar (8) also recorded from

113 10 to 17 days difference in for different apple cultivars. Sharma *et al.* (9) reported that duration

114 of flowering in Himachal Pradesh ranged from 10 to 17 days in apple.

115 CONCLUSIONS

116 From the above study obtained results, it was concluded that the different exotic cultivars studied had
117 varied different flowering phenological

118 and flowering features which will be permit beneficial to establish for devising proper varietal combinations for

119 pollination to improve profitability of high density apple orchards.

119 REFERENCES

120 1. Anonymous, 2017. Statement showing area, production and productivity of fruits in

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Comment [FD21]: Yes, the beginning of apple blooming is always under two factors: a) the chilling requirement of the variety; b) the spring (initial) temperature. The first is usually variable along the years. For the same variety under the same spring temperature, the bloom will begins earlier after a cold winter then after a mild winter.

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Comment [FD22]: As Golden Clone B needs much more winter chilling then Gala Red Lum, it begins blooming later.

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Comment [FD23]: The initial of flowering is related to the different chilling requirement of the different cultivars (the shorter the chilling requirement, the earlier the initial flowering). But the length of blooming is strongly associated with genetic features, although the winter chilling satisfaction of buds also should influences.

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~~120~~121_____ J&K State. Department of Horticulture (J&K).

~~121~~122_____ 2. Baytekin, S. 2006. Performance of some apple cultivars in ecology of Turhal district

~~122~~123_____ of Tokat province. M.Sc. Thesis. Dept. of Horticulture. Fac. of Agri., Gaziosmanpasa

~~123~~124_____ Univ., Tokat, Turkey.

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- 124 3. Blazek, J., Paprstein, F. and Kucera, J. 1983. Flowering phenology of apple cultivars.
125 *Vocnarske* 9: 101-22.
- 126 4. Bodor, P. and Toth, M. 2007. Floral phenology and fructification features of scab
127 resistant apple varieties and hybrids. Lippay Janos-Ormos Imre-Vas Karoly
128 Tudomanyos Ulesszak (November 7-8) Budapest, Abstracts, pp. 144-45.
- 129 5. Facticeau, T., Rove, K. and Chestnut, N. 1986. Firmness of sweet cherry fruit following
130 growing in New York. *Proc. Amer. Soc. Hort. Sci.* 57: 169-78.
- 131 6. Fisher, M. 1950. Colour atlas of fruit cultivar, pp. 320.
- 132 7. Gasser, H. 1994. Seit 30 Jahren der warmste Marz. *Obstbau* 31(5): 155.
- 133 8. Kumar, R. 1996. Studies on hybridization in apple (*Malus x domestica* Borkh). Ph.D.
134 Thesis, Dr.Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan (HP),
135 India.
- 136 9. Sharma, G., Roshan, A. and Sharma, O.C. 2006. Floral biology and effect of
137 pollination in apple (*Malus x domestica*). *Indian Journal of Agricultural Sciences*
138 75(10): 667-69.
- 139 10. Soltesz, M. 2002. Alma. In: *Fajtatartitas a Gyumolesultetvenyekben*. [Eds. J., Nyeki,
140 M., Soltesz and Z., Szabo]. *Mezogazda Kiado, Budapest*, pp. 72-150.

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151 **Table 1.** Phenological stages of exotic apple cultivars under high density plantation for the 2014
season at the Experimental Orchards of Division of Fruit Science, Sher-e-Kashmir University of
Agricultural Science & Technology of Kashmir, Srinagar, Jammu & Kashmir - North Himalayan
region of India

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Variety	Days after reference date (DARD) (1 st March)			
	Days to bud break	Days to silver tip stage	Days to green tip stage	Days to leafing-out
Super Chief Sandidge	16.42 ±0.17	21.36 ±0.16	25.92 ±0.66	32.26 ±0.09
Gala Red Lum	15.27 ±0.21	20.20 ±0.10	23.57 ±0.05	29.48 ±0.15
Fuji Zhen Aztec	18.49 ±0.18	23.50 ±0.50	27.60 ±0.16	34.52 ±0.13
Golden Clone B	21.50 ±0.20	25.49 ±0.20	28.36 ±0.16	36.66 ±0.18
CD (p≤ 0.05)	0.59	0.45	0.57	0.43

153 DARD: Days after reference date (1st March).

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Table 2. Flowering behavior of exotic apple cultivars under high density plantation at the Experimental Orchards of Division of Fruit Science, Sher-e-Kashmir University of Agricultural Science & Technology of Kashmir, Srinagar, Jammu & Kashmir during the 2014 season - North Himalayan region of India.

Variety	Days after reference date (DARD) (1 st March)				Duration of flowering (days)
	Days to pink bud stage	Days to Initial bloom (10%) ^{1/}	Days to Full bloom (85-90%) ^{1/}	Days to petal fall (80%) ^{2/}	
Super Chief Sandidge	40.68 ±0.40	45.35 ±0.11	55.54±0.08	65.05±0.43	12.28±0.11
Gala Red Lum	39.44 ±0.13	44.41 ±0.14	52.29±0.06	60.64±0.19	13.51±0.18
Fuji Zhen Aztec	43.69 ±0.09	47.85 ±0.04	56.50±0.15	65.88±0.25	12.36±0.10
Golden Clone B	44.86 ±0.06	48.46 ±0.17	58.79±0.08	66.24±0.34	13.69±0.34
CD (p≤ 0.05)	0.70	0.40	0.32	0.84	0.64

^{1/} DARD: Days after reference date (1st March).

^{2/} Refers to the percentage of opened flowers. Refers to the percentage of fallen petals

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Figure 1: A view of the experimental orchard at SKUAST-Kashmir

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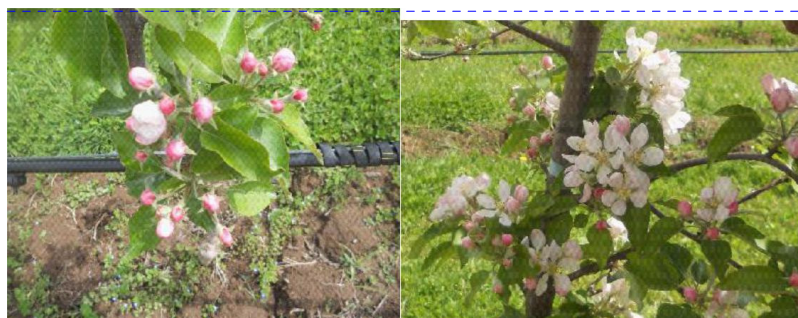


Figure 2: Different phenological stages of bud break on apple

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(a) Initial bloom

(b) Full bloom

Figure 3: Flowering stages of initial bloom and final bloom of apple

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189 ~~Figure 3: Flowering stages at initial bloom and final bloom were recorded~~

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This sentence is confused. What do you mean with 17 days ? The lapse from the shorter to the longer flowering period of the different cultivars ?

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For different apple varieties, is it ?

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By taking in a count the best coincidence of blooming among the four apple varieties studied, I will suggest to you the following conclusion: **For cross pollination the best combinations among the studied apple varieties are: Gala Red Lum x Super Chief Sandidge and Fuji Zhen Aztec x Golden Clone B.**

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