A Case Study on Climatic Variability Associated with Pruning tea, *Camellia sinensis* (L.) O. Kuntze in Uva Region

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ABSTRACT

Although, many climatic factors exert a significant influence on the growth of tea, generally only rainfall (quantum and distribution) has been considered in determining the optimum time to carry out cultural operations such as pruning in tea. Successful recovering of tea bushes after pruning is highly dependent on weather factors. However, the recommended time for pruning in the Uva region (September-October) is largely based on rainfall paying less attention to the other climatic factors. The present study was carried out to determine the adoption rate of this recommendation in estates, and to explore possibility of refining the current recommendation through analyses of several climate parameters.

A survey revealed that only 17.24% of the tea extent was pruned during September-October, and another 17.27% in March-April as recommended by the Tea Research Institute of Sri Lanka. Hence, two-third of the extent pruned outside the recommended period, showing a case of low rate of adoption of the recommendation.

Analyses of important climatic factors shows that the weather conditions in January-April are more conducive for pruning tea in the Uva region. However, sufficient field information on recovering after pruning is necessary to confirm the suitability of new season proposed for pruning.

This study amply demonstrates the importance of taking into account the effect of many climatic parameters such as rainfall, maximum and minimum temperature, sunshine hours, relative humidity and wind velocity in determining the optimum time for pruning tea. Therefore, analysis of long term climatic parameters may prove to be a valuable tool for scheduling cultural practices of tea.

Key words: Climatic factors, time of pruning

INTRODUCTION

Tea, *Camellia sinensis* (L.) O. Kuntze, is a perennial crop of prime importance to the economy of Sri Lanka. The technology for tea cultivation is at a high level of development and tea plantations are generally well organized and systematically managed.

Climatic factors exert a significant influence on the growth of tea. Climatic parameters such as solar radiation, rainfall, vapour pressure deficit and wind affect the growth of tea (Watson, 2008). Seasonal variation of climatic parameters significantly influences the yield and quality of tea (Devanathan, 1975; Car and Stephens, 1992; Wijeratne and Fordham, 1996). Climatic factors also have an important bearing on the incidence of pests and diseases of tea. Although, many climatic factors play a significant role in the growth of tea, generally only rainfall (quantum and distribution) has been considered in determining the optimum time to carry out cultural operations in tea.

Rainfall in Sri Lanka generally results from atmospheric disturbances in the intra tropical convergence zone (ITCZ) and the south-west and north-east monsoons. It exhibits a marked seasonality in spatial and temporal distribution (Suppiah, 1989). Accordingly, four rainy seasons have been identified *viz.* first inter-monsoon (FIM) from March to April; south-west monsoon (SWM) from May to September; second inter-monsoon (SIM) from October to November; and north-east monsoon (NEM) from December to February.

According to Peiris *et al.,* (2006), 60% of the annual rainfall in the Uva region is received from the SIM and NEM rainy seasons (October to February) with very little rainfall in the month of February. The FIM season, which contributes only about 15% of the annual rainfall, is followed by an extended dry season during the SWM period which brings less than 25% of the annual rainfall over the five month period from May to September.

Pruning of tea is a cultural operation that is highly dependent on weather for its success. Unfavorable weather conditions during the recovery phase will result in numerous problems such as dieback of new shoots, blister blight damage to young shoots, uneven and slow recovery, and sun scorch of frame branches leading to wood rot and frame debilitation, all of which will lead to yield losses. In extreme situations it can result in the death of bushes reducing the plant stand and productivity of the plantation.

The Tea Research Institute's recommendation for the Uva region is to prune high-yielding tea fields during September or October, which is an assured season of rain in this region. If the pruning program cannot be completed during this period, the remainder should be pruned during the south-west monsoon (Anon, 2001).

During informal discussions, however, it transpired that many plantation managers in Uva region do not adhere to these recommended periods. Based on their experience some consider that September-October is not the most suitable period for pruning in Uva region. The reasons for such deviations are not clear, but it may be due to unsuitable weather conditions, other than rainfall. Therefore, in the present study, a survey was conducted in Uva region to collect information on pruning history. Data on several climatic factors were also collected in order to study their influence, either individually or collectively, on recovery from pruning. This study was undertaken to determine the adoption rate of the recommendation on time of pruning, and to explore the possibility of refining this recommendation through an analysis of climate parameters.

METHODOLOGY

The survey on pruning covered 23 of the 64 tea estates in the Uva region. The sample was selected with the aid of the Badulla District Tea Master Plan representing all agro-ecological regions (AERs) in Uva. Single stage stratified random sampling was adopted as the sampling procedure. Site details of the selected estates are given in Table 1.

The information and data collected during the survey were as follows;

i) The time of pruning (calendar month), extent pruned (in hectares) and time taken to recover from pruning (in months) over the last ten years (1998-2007) were recorded. This period covered at least two pruning cycles. In eight estates, information on the extent pruned in a given month was not available. For these estates information on time of pruning was recorded in a binary format *i.e.* pruning was either done or not done in a particular month.

ii) The month-wise occurrence of blister blight leaf disease over the last five years (2003-2007), the control measures used (fungicides and frequency of application) and their costs and months that required frequent applications of fungicides were recorded. Other months were considered as being free of blister blight infestation.

iii) Monthly rainfall and yield data over a period of 20 years (1988-2007) were recorded. Various exercises were carried out to ascertain the quality of the data. All records were subjected to careful investigation for outliers by comparing with the data obtained from nearby agro-meteorological stations and all dubious records were discarded.

iv) Monthly data on maximum and minimum temperature, sunshine hours, wind velocity and relative humidity for the same twenty year period were also collected from meteorological and agro-met stations at Badulla,

Bandarawela and Passara. Observations that had values flagged as questionable or missing were eliminated from the data sets.

Table 1. Site details of the 23 estates selected for the survey

Name of the estate	AER	Elevation (ft)	Longitude	Latitude
Roeberry (Rb)	IU2	975-1249	80^0 45′	6^0 30′
Cocagala (Cg)	IU2	1280	80^0 45′	6^0 30′
Verallapathana (Vp)	IU2	914-1326	80^0 45′	6^0 30′
Batawatta (Bt)	IU2	1077-1538	80^0 45′	6^0 30′
Mahadowa (Md)	IU2	1200-1368	80^0 45′	6^0 30′
El-Teb (Et)	IU2	610-1200	80^0 45′	6^0 30′
Sania (Sn)	IU2	792-1676	80^0 40′	6^0 30′
Shawlands (Shl)	IU2	790-1173	80^0 45′	6^0 04′
Haputale (Htl)	IU3a	515-1418	80^0 35′	6^0 20′
Nayabedde (Nb)	IU3a	1374-1924	80^0 45′	6^0 22′
Pitaratmale (Ptrm)	IU3b	515-1173	80^0 35′	6^0 20′
Downside (Ds)	IU3c	917-1213	80^0 40′	6^0 20′
Hindagala (Hg)	IU3c	760-2130	80^0 40′	6^0 30′
Kahagalla (Kg)	IU3c	1219-1528	80^0 35′	6^0 20′
Kinellan (Kin)	IU3c	1057-1097	80^0 45′	6^0 30′
Queenstown (Qt)	IU3c	660-1080	80^0 40′	6^0 04′
Wewesse (Ww)	IU3c	930-1524	80^0 45′	6^0 30′
Spring valley (Sv)	IU3c	792-1679	80^0 45′	6^0 30′
Attampitiya (Ap)	IU3c	*	80^0 40′	6^0 20′
Welimada (Wm)	IU3e	714-1219	80^0 30′	6^0 24′
Telbedde (Tb)	IM1a	997-1402	80^0 45′	6^0 30′
Adawatta (Ada)	IM2b	795	80^0 45′	6^0 30′
Hopton (Ht)	IM2b	*	80^0 45′	6^0 04′

IU- Up country intermediate zone; IM- Mid country intermediate zone
Numbers and simple letters refer to different agro ecological sub regions

RESULTS

Time of pruning tea in the Uva region

The survey revealed that tea fields have been pruned in the sampled estates throughout the year, except in the months of June, July and September in IU3b. The most favoured months for pruning were January and July for IU2, January, October and November for IU3c, May and October for IU3b and January, April and May for IM2b (Table 2).

Table 2. Extent pruned in each month (averaged over the ten-year period 1998 to 2007), expressed as a percent, in different AERs of the Uva region

AER	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
IU2	21.5	5.4	10.7	3.7	2.5	3.2	28.2	11.4	7.7	3.6	0.9	1.4
IU3c	13.0	8.1	10.0	7.9	5.6	5.8	5.4	6.2	7.9	10.6	11.0	8.6
IU3b	9.1	13.5	5.0	14.7	20.8	12.1	9.5	4.0	13.0	19.9	12.5	0.5
IM2b	17.0	6.9	5.9	11.7	10.4	8.1	5.3	3.5	10.0	9.4	6.9	4.9
Average	15.5	8.2	7.9	9.4	9.5	4.6	9.9	6.2	6.8	10.5	7.6	4.0

Data on pruning extent in each month was not available for selected estates in AERs IU3a, IM1a and IU3e. Therefore, these three AERs were not included in the Table 2.

The proportion of tea pruned during the recommended periods (RP) *viz.* September-October and March-April and outside the recommended period (ORP), over the ten year study period expressed as a percentage, is presented estate-wise, in Figures 1 & 2. Figure 1 covers Shawlands (Shl), Mahadowa (Md), Batawatta (Bt), Veralapathana (Vp), Cocagala (Cg), Roeberry (Rb), Kahagalla (Kg), Wewesse (Ww), Blairlomond (Blmn), Queenstown (Qt), Pitaratmale (Ptrm), Hopton (Ht) and Adawatta (Ada) estates, where the computation was based on the hectareage pruned in each month. Figure 2 covers Telbedde (Tb), Kinellen (Kin), Hindagala (Hg), Haputale (Htl), Attampitiya (Ap), Nayabedde (Nb), Sania (Sn) and El-Teb (Et) estates, where the computation was based on whether pruning was done or not done in a particular month. Pruning data was not available from Downside estate.

In the estates covered in Figure 1, the extent pruned during the recommended period was remarkably small and ranged from 15.22% in Mahadova estate to 49.92% in Kahagalla estate, which means that 50.08% to 84.78% were pruned outside the recommended months. On average, only 31.49% of the tea was pruned during the recommended months while 68.51% was pruned during other months, over the last 10 years. Wilcoxon Signed Rank Test statistic showed that the two groups were significantly different at asymptotic significance 0.001.

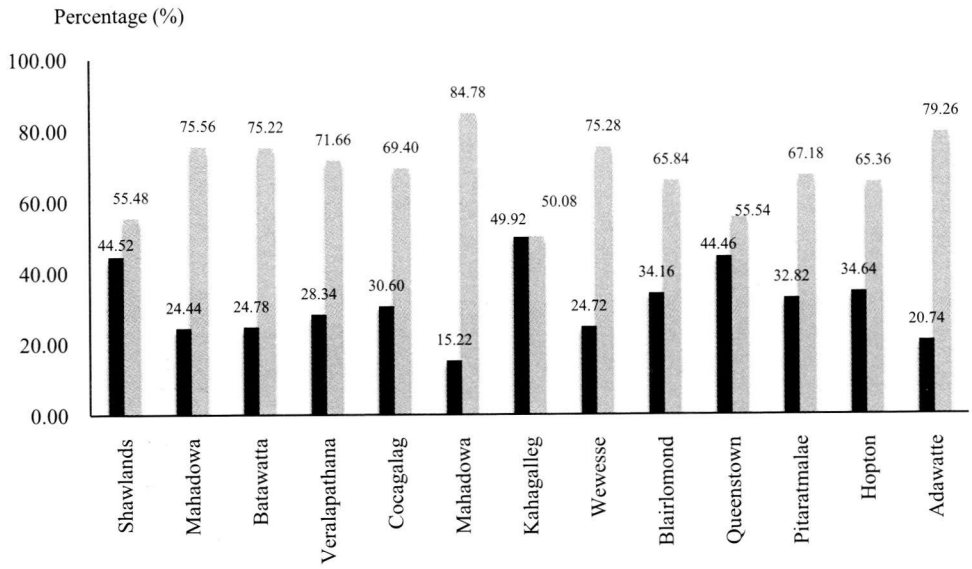

Figure 1. Proportion of tea pruned during the recommended period (RP) and outside the recommended period (ORP) (expressed as a percentage of the extent in hectares)

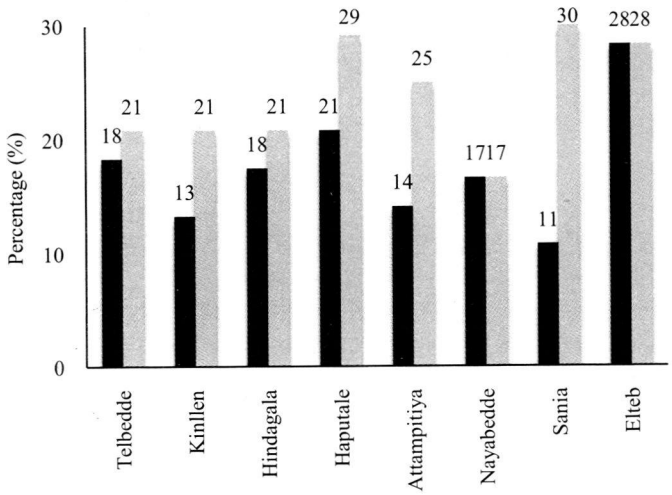

Figure 2. Proportion of tea pruned during the recommended period (RP) and outside the recommended period (ORP) (expressed as percentage of occurrence of pruning in each period)

In the estates covered in Figure 2, on average, 17.5% of the pruning was done in the recommended months, and 23.96% was done in other months outside the recommended period. These results are in accord with those of the estates covered in Figure 1.

The second best period recommended for pruning in the Uva is stated as the south-west monsoon (Anon, 2001). Presumably, this refers to the south-west monsoon planting season which commences with the FIM (March-April) which brings significant rainfall; hence March-April was taken as the second best period recommended for pruning. On average 17.27% of the extent pruned was carried out in March-April (Table 2). Therefore, only 31.49% of the pruning was carried out in the two periods recommended as the best and second best for pruning in Uva; 68.51% of the pruning took place outside the recommended months of September, October, March and April. It is also clear from Table 2 that the monthly distribution of pruning over the year varied in different agro ecological regions. However, it is interesting to note that January, which is not recommended for pruning, records the highest extent pruned per month in all AERs except IU3b. As much as 15.5% of the pruned extent was done in the single month of January, as against 31.49% in September, October, March and April, the four months recommended as being the best for pruning in Uva.

Recovery from pruning

Generally, it takes about 80 to 100 days (around 3 months) for pruned tea to recover and resume production. Yield records maintained by estates were used to determine the time taken for recovery from pruning (Table 3).

The data presented in Table 3 is essentially an approximation of biological recovery as estate practice in bringing the pruned tea back into production differs somewhat. However, it appears that generally recovery is slower in tea pruned in April, November and December.

Rainfall pattern and tea yields in the Uva region

Monthly rainfall and yield (made tea-MT) of selected estates in AERs IU2, IU3a, IU3b, IU3c, IU3e, IM1a and IM2 b, averaged over the twenty-year period (1988-2007), are presented in Figures 3, 4, 5 & 6. Both rainfall and yield follow a bimodal pattern with peaks in the first and second halves of the year. In the yield curve, the March-June peak in the first half of the year is more prominent than the peak in the second half of the year, whereas in the rainfall curve the peak in the second half of the year is more prominent (Figures 3, 4, 5 & 6) than the other.

Table 3.Time (months) taken to recover from pruning and resume production in different AERs

Time of pruning	IU2	IU3a	IU3b	IU3c	IU3e	IM2b	IM1a
January	3	4	3	3	3	3	3
February	3	4	3	3	NP	3	3
March	3	4	3	3	3	4	3
April	3	3	4	4	3	5	4
May	3	3	3	3	NP	NP	4
June	3	4	3	3	NP	3	3
July	3	3	3	3	NP	3	3
August	3	3	4	4	NP	3	3
September	3	3	4	3	NP	4	3
October	3	4	4	3	3	3	3
November	4	4	4	3	3	3	4
December	3	4	4	3	3	NP	4

NP- No pruning

Nearly in all the selected estates, the rainfall in the months of October, November and December, exceeds 300 mm. The 75% expectancy value of rainfall during these three months, in many estates, is higher than the reported mean rainfall value of the AER. In all estates, except Welimada estate, average rainfall in the months of January to April exceeds 100 mm per month, which is regarded as the minimum requirement for tea.

On average, 58% of the annual yield is harvested from January to June; 42% from July to December (Table 4). In all AERs the yield peaks during the March-June period, which is well known as the Uva rush crop season. As much as 45% of the annual yield is obtained during this 4 month period.

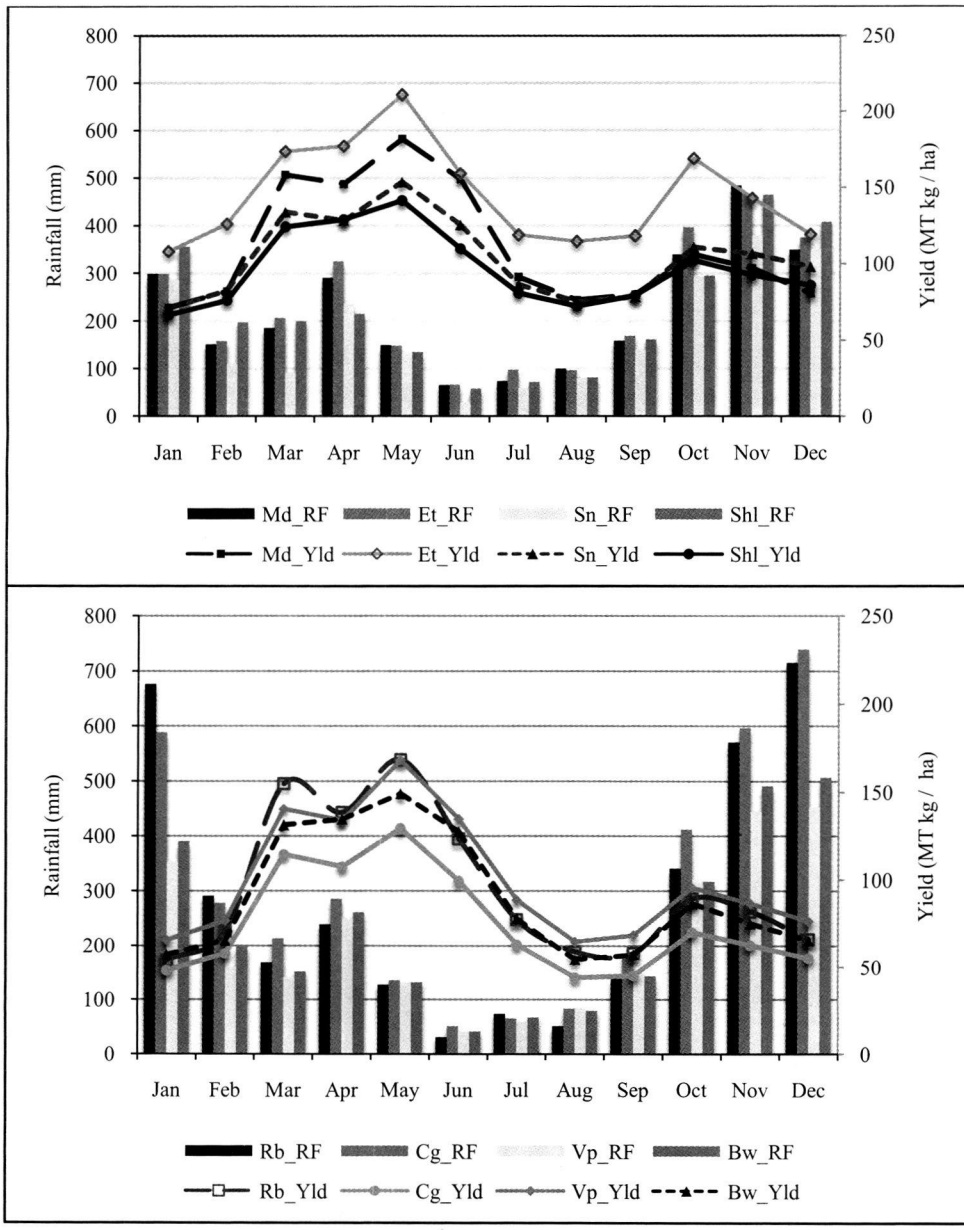

Figure 3. Average monthly rainfall (RF in mm) and yield (Yld- in MT kg/ ha) of selected estates in AER IU2

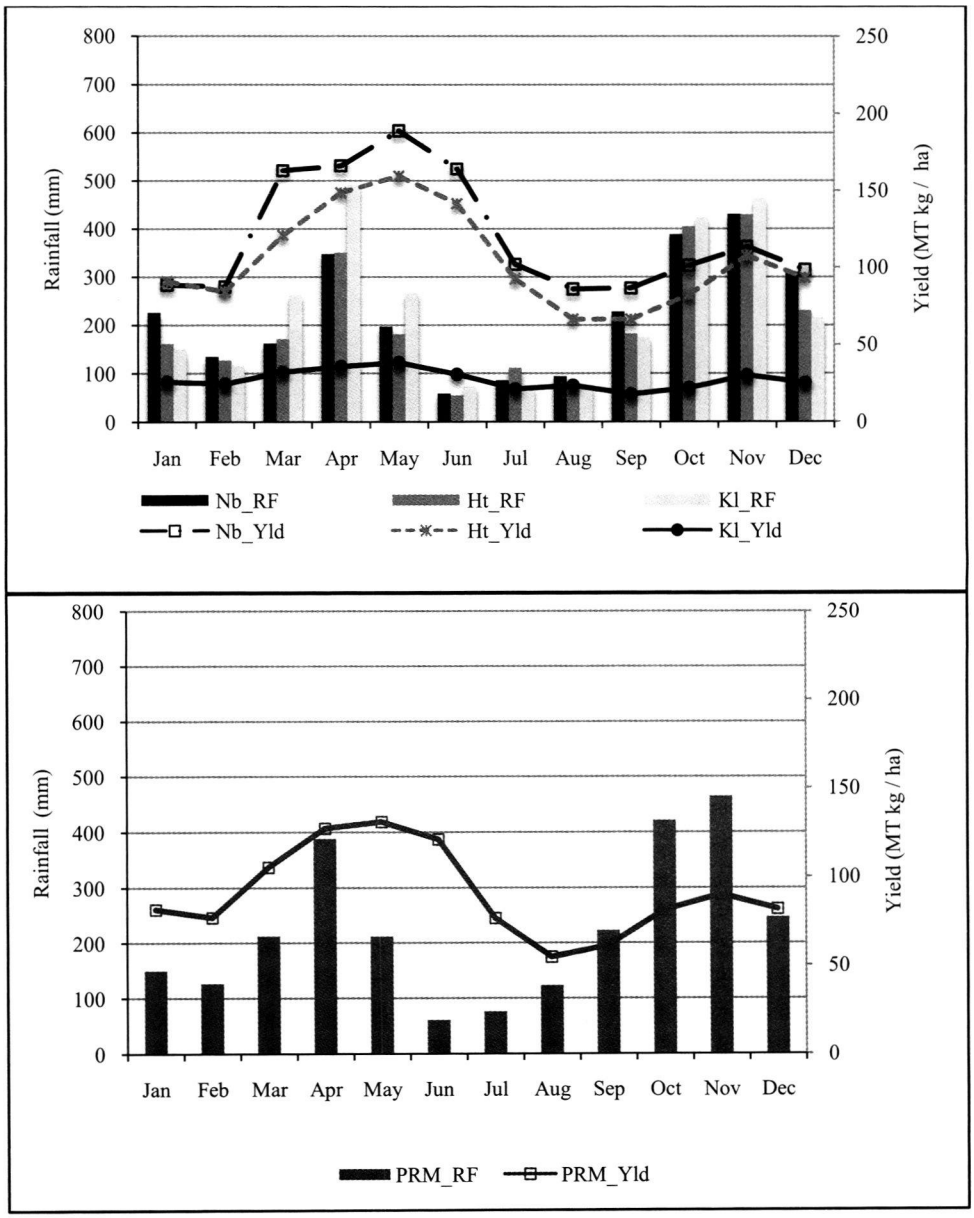

Figure 4. Average monthly rainfall (RF in mm) and yield (Yld- in MT kg/ ha) of selected estates in AERs IU3a and IU3b

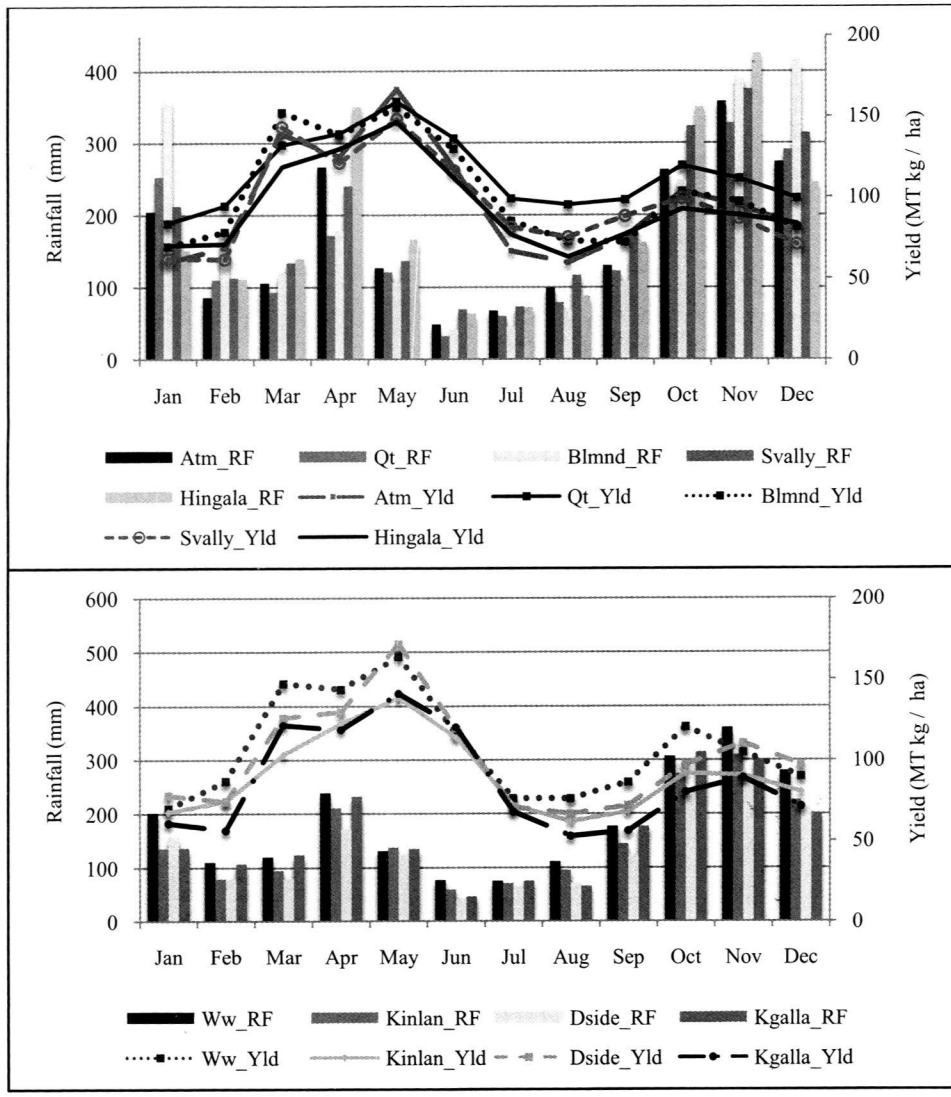

Figure 5. Average monthly rainfall (RF in mm) and yield (Yld- in MT kg/ ha) of selected estates in AER IU3c

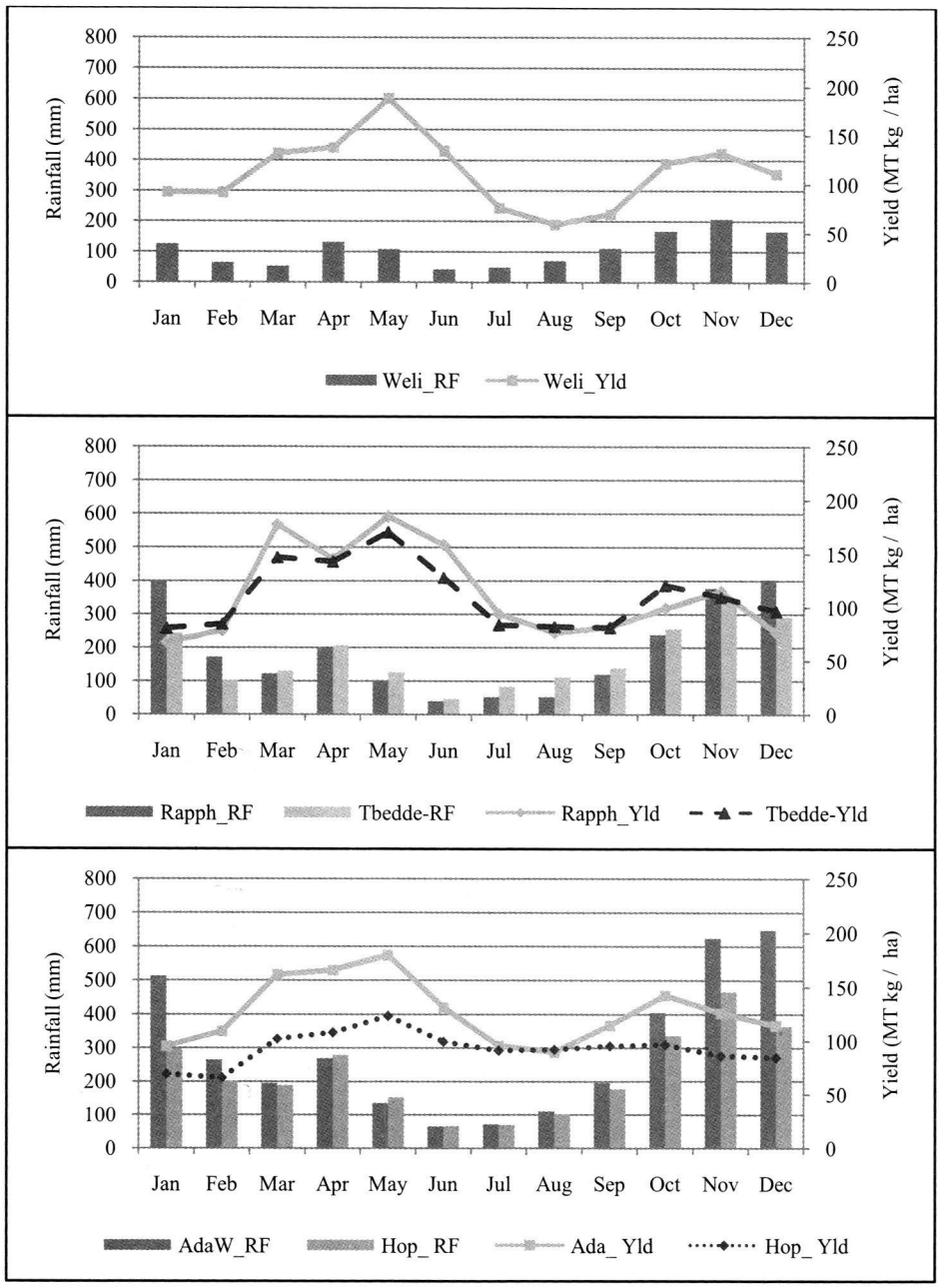

Figure 6. Average monthly rainfall (RF in mm) and yield (Yld- in MT kg/ ha) of selected estates in AER IU3e, IM1a and IM2b

Table 4. Percentage of annual yield harvested during different periods of selected estates in different agro ecological regions in Uva

Agro ecological region (AER)	Percentage annual yield harvested			
	Jan-Feb	Mar-Jun	Jul-Aug	Sep-Dec
IU2	12	47	13	29
IU3a	13	46	13	28
IU3b	15	45	12	29
IU3c	12	45	12	30
IU3e	14	44	10	32
IM1a	12	47	13	29
IM2b	13	41	14	33
Average	13	45	12	30

Occurrence of blister blight leaf disease in Uva region

The occurrence of blister blight leaf disease at economic injury level, during the 5-year period (2003-2007), in selected estates is presented in Table 5. An occurrence level of 100 for a given month denotes that all the fields of selected estates in the relevant AER were subject to severe infestations of blister blight during that month. Accordingly, tea fields are most vulnerable to blister blight leaf disease in November, December, January and February.

Table 5. Occurrence of blister blight leaf disease in selected estates over the five year period (2003-2007)

	IU2	IU3a	IU3b*	IU3c	IU3e*	IM2b	IM 1a*
Jan	89	90	60	87	0	100	60
Feb	69	90	40	83	0	90	40
Mar	40	30	40	20	0	10	0
Apr	0	10	20	7	0	0	0
May	0	10	60	0	0	0	0
Jun	0	0	40	0	0	0	0
Jul	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0
Sep	0	0	0	0	0	0	60
Oct	20	20	0	20	100	0	60
Nov	63	70	60	83	100	30	40
Dec	80	90	100	90	100	100	100

*Only one or two selected estates are located in the AER

(100 = All the fields of selected estates were subjected to severe infection of blister blight)

Monthly variation of selected climatic parameters

The monthly maximum and minimum temperatures, sunshine hours, wind velocity, rainfall and relative humidity in the Bandarawela, Badulla and Passara, averaged over 20 years (1988-2007), are presented in Figures 7, 8 and 9 respectively. The Uva region is covered by three Agro-met Stations located in Bandarawela, Badulla and Passara. The Bandarawela Agro-met Station's data are applicable to Kahagalla, Pitaratmale, Kinellan, Haputale, Nayabedde and Hindagala estates; Badulla data are applicable to Wewesse, Blairlomond, Queenstown, Telbedde, Attampitiya and Sania estates; and Passara data are applicable to Shawlands, Mahadowa, Batawatta, Verallapathana, Cocagala, Roeberry, Hopton, Adawatta and El-Teb estates.

The difference between maximum and minimum temperatures (diurnal temperature range) increased from January to May and decreased from September to December in all three regions. Over the February to May period the diurnal temperature range varied from 10.3-11.6, compared to 7.6-9.6 over the October to December period.

Sunshine hours decreased from September to December. This decreasing trend was statistically significant, at P=0.008 and 0.05, in the Passara and Bandarawela regions respectively.

Relative humidity increases during the SIM and NEM period in all 3 regions. Wind velocity shows an increasing trend from September to December at Passara but not at Bandarawela or Badulla.

DISCUSSION

Adoption rate of the recommendation on time of pruning

The optimum time recommended for pruning tea in the Uva, is September-October, at the commencement of the SIM and the next best period recommended is March-April. Averaged over all the AERs in the Uva region, only 17.24% of the tea was pruned during September-October, and another 17.27% in March-April. Hence, only one-third of the pruning was carried out in the two periods recommended above as two-thirds of the pruning took place outside the recommended months of September, October, March and April. It is evident with this data that the adoption of the recommendation on time of pruning is poor in the Uva region. The most favored month for pruning by plantation managers was January with 15.5% of the extent being pruned in this single month as against a total of 34.52% in the four recommended months. In fact, the survey revealed that pruning takes place throughout the year. This is indicative of the lack of knowledge on selecting the best time for pruning and calls for an analysis of the reasons for the poor adoption of the current recommendation.

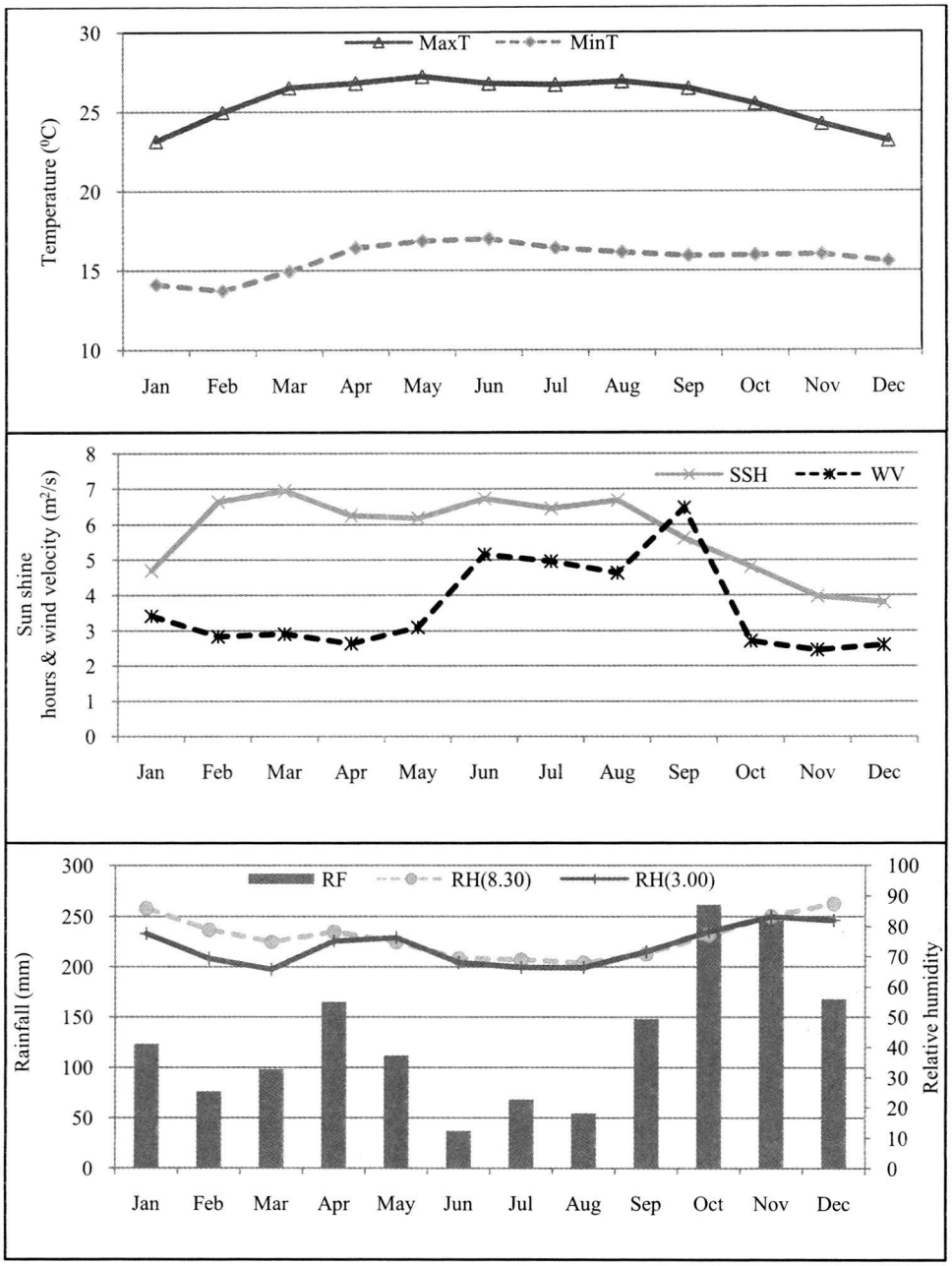

Figure 7. Average monthly maximum (Max T) and minimum temperatures (MinT), sunshine hours (SSH), wind velocity (WV), rainfall (RF) and relative humidity (RH) in the Bandarawela

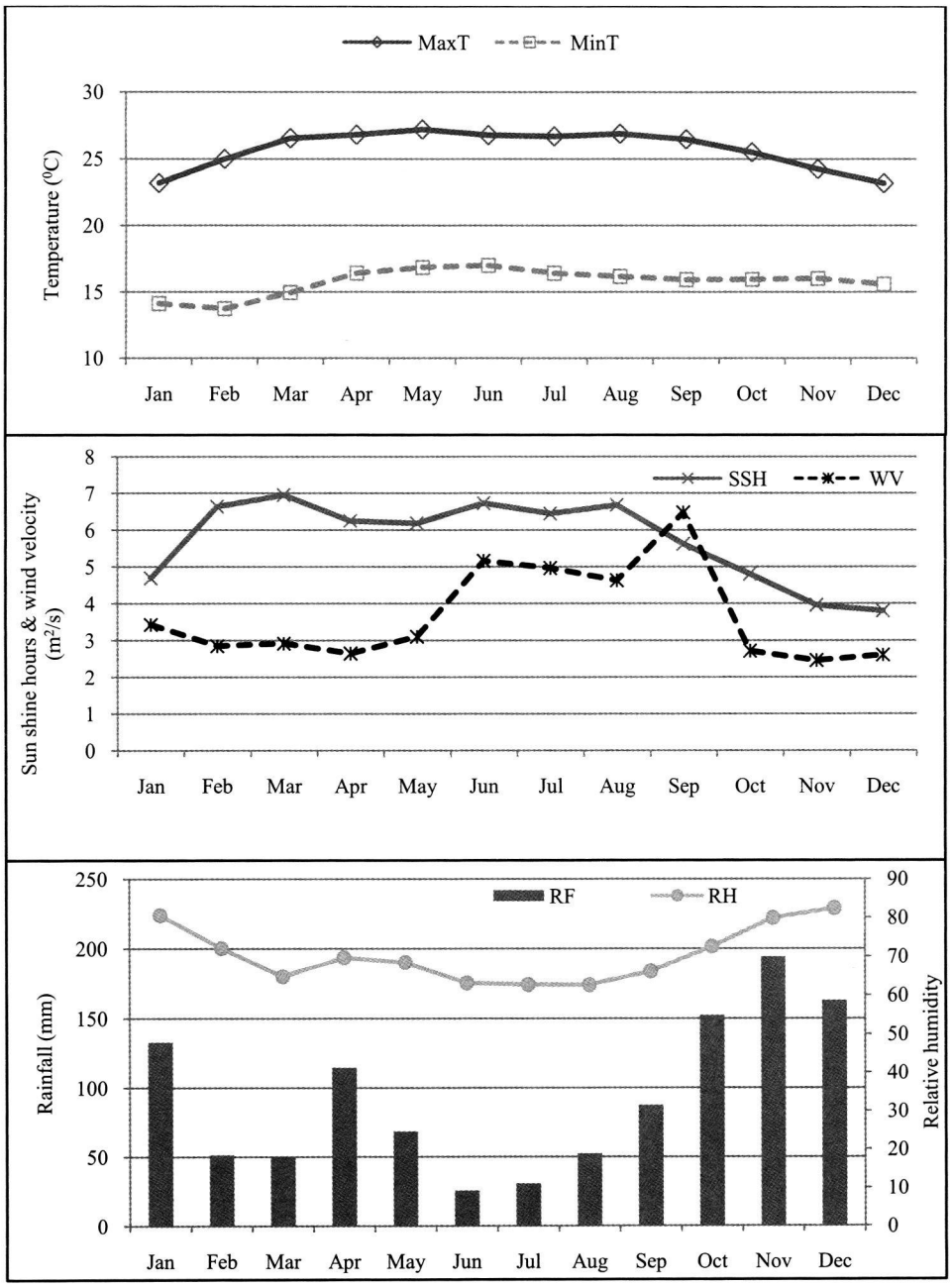

Figure 8. Average monthly maximum (MaxT) and minimum (MinT) temperatures, sunshine hours (SSH), wind velocity (WV), rainfall (RF) and relative humidity (RH) in the Badulla

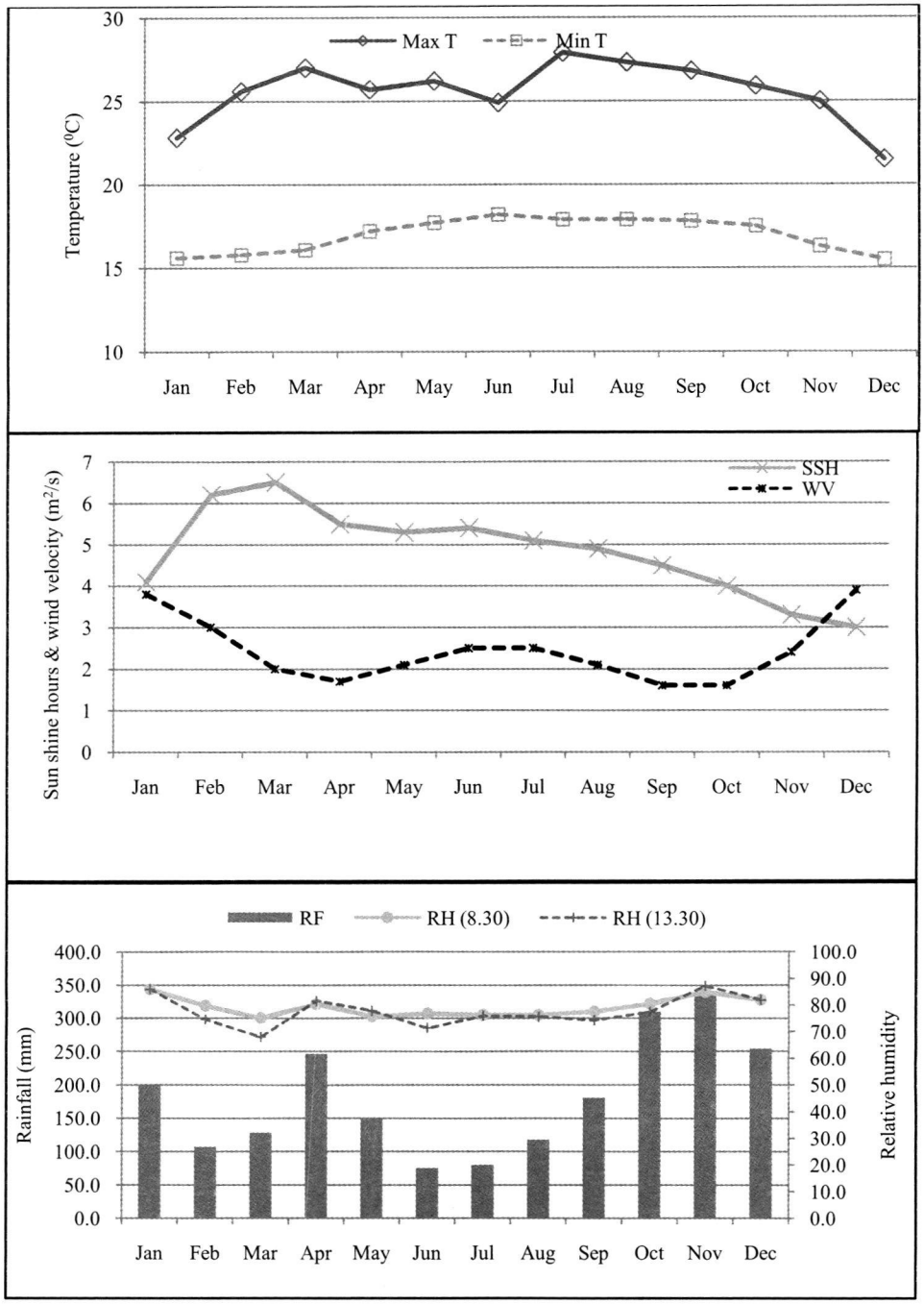

Figure 9. Average monthly maximum (MaxT) and minimum (MinT) temperatures, sunshine hours (SSH), wind velocity (WV), rainfall (RF) and relative humidity (RH) in the Passara region

Possible reasons for the low adoption rate

Tea bushes are pruned at regular intervals mainly to manage bush height and to restore vegetative vigor and stimulate vegetative shoot growth to maximize production. Pruning is an unavoidable interruption of production. Hence, to hasten recovery, and restore production as soon as possible, fields should be pruned when the climatic conditions are extremely favorable for vegetative growth. In this regard, rainfall is, no doubt, a key factor. The recommendation of September-October, described as an assured season of rain, as the best time to prune tea in Uva seems to have been determined solely on the basis of rainfall. However, growth is not dependent on just a single factor; it is an optimum combination of rainfall, sunshine hours and temperature that will maximize vegetative growth of tea (Devanathan, 1975).

An analysis of the climatic data, over the 20-year period from 1988-2007 (Figures 3 to 9), reveals that rainfall during September-December period is generally very high and is quite adequate to support unrestricted vegetative growth in the estates studied. The average monthly rainfall of these two months was over 300 mm in almost all estates in IU2, and over 200 mm in all estates in the other AERs, except for the month of September in IU3c estates. On the other hand, sunshine hours and diurnal temperature variation, recorded at the agro-met stations in Passara, Bandarawela and Badulla, show a decreasing trend over the September-December period. In Passara, with an annual average of 4.8 sunshine hours per day (SSH/d), the average for September was 4.5 SSH/d declining to 3.0 SSH/d in December. In Bandarawela, with an annual average of 6.0 SSH/d, the average for September was 5.5 SSH/d declining to 4.0 SSH/d in December. In Badulla, with an annual average of 4.8 SSH/d, the average for September was 4.5 SSH/d declining to 3.0 SSH/d in December. In the case of diurnal temperature variation; in Passara, the monthly average for September was 9 °C declining to 6 °C in December. In Bandarawela, the average for September was 10.6 °C declining to 7.6 °C in December. In Badulla, the monthly average for September was 7.1 °C declining to 3.4 °C in December. The above analysis shows that although rainfall is sufficient for successful recovery, the associated reduction in both sunshine hours and diurnal temperature can limit vegetative growth during the September-December period. Wind velocity and relative humidity are two other climatic factors that can impact on the recovery from pruning. High wind velocity and high humidity during the recovery period can damage tender shoots, the former directly and the latter indirectly by predisposing them to blister blight disease. Agro-met station records show that relative humidity, over the year, is highest in the months of November, December and January in Bandarawela (83.3%, 84.8% and 81.9% respectively), Passara (86.1%, 81.9% and 85.9% respectively) and Badulla areas (79.9%, 82.4% and 80.6% respectively) (Figures 7 to 9). The low sunshine hours and high humidity over the November-January period when the bushes are recovering will provide ideal conditions for blister blight infection of the new shoots. Wind velocity appears to be a problem only in

the Passara area where it increases steadily from 1.6 km per hr in September to 3.9 km per hr in December and January. From the above analysis it is evident that the climatic factors during September-October period is not very conducive for pruning in Uva region.

The second best period recommended for pruning is March-April. Rainfall over this period exceeds 100 mm per month, which is generally regarded as the minimum requirement for tea, except for a few cases. One estate in IU2 and 3 estates in IU3c received less than 100 mm in March. Diurnal temperatures in the March-June recovery period vary around 10 ^{0}C at Bandarawela and 8.5 ^{0}C in Passara and Badulla. These diurnal temperature variations are greater than those in the September-December period and also show an increasing trend. Sunshine hours per day during March-June is considerably higher than that in September-December. Mean SSH/d during the March-June recovery period in Bandarawela, Passara and Badulla being 6.5, 5.7 and 5.7, respectively. Average relative humidity during March-June at Bandarawela, Passara and Badulla was 72.9%, 75.8% and 66.5% respectively. When limiting factors are considered, March-April is a better pruning season than September-October period.

The survey revealed that the month most favored for pruning, by plantation managers, was January (Table 2). Some 15% of the total extent was pruned in January. An analysis of the salient climatic factors relating to the January-March period shows that rainfall was more than 100 mm, except on 4 occasions in February, over the last 20 years. The diurnal temperatures during this period show an increasing trend in all 3 Agro-met Stations: Bandarawela (from 9.0 °C to 11.6 °C), Passara (from 7.2 °C to 10.9 °C) and Badulla (from 5.8 °C to 7.4 °C). Increasing trends were also observed in SSH/d at all stations: Bandarawela (from 4.7 to 7.0), Passara (from 4.1 to 6.5) and Badulla (from 4.1 to 6.5). Also, the maximum temperature during January is below 25 ^{0}C and therefore, the risk of stem canker is minimal. Accordingly, January-March period is also having favorable climatic conditions for pruning. As noted earlier, November-February is the blister blight season in the Uva region. Pruning during September-October will therefore, jeopardize the recovery process if proper control measures are not adopted. To protect the new shoots from blister blight and avoid a serious setback to the growth of the tea bush it will be necessary to resort to chemical control measures. This is a costly operation with the recommended procedure being a combination of copper and systemic fungicides, at around 5-10 day intervals, over a period of about 3 months. The cost of the recommended chemical control measures have been estimated at approximately Rs. 7898.00 per hectare. This expenditure can be reduced considerably by pruning in January-April instead of September-October.

The foregoing analysis of important climatic parameters shows that in terms of sunshine hours and diurnal temperatures and also some climatic factors that

predispose young tea shoots to blister blight disease, the September-October period is not very suitable for pruning tea in the Uva region. On the other hand, the analysis reveals that climatic conditions during January-April period favor pruning in Uva. In fact, the survey indicated that 41% of the total extent pruned each year is being carried out during these four months (Table 2).

Data recorded at the three Agro-met Stations at Bandararwela, Badulla and Passara show that there is a considerable variation in the climatic conditions within the Uva region. This suggests that recommendations on the pruning season in the Uva region are best done on an agro-ecological region basis. However, weather data other than rainfall is not available on an agro-ecological region basis.

CONCLUSION

This study concludes that the climatic conditions experienced in January-April are more conducive for pruning tea in the Uva region. This is mainly due to prevalence of more favorable conditions for recovery especially in terms of sunshine hours and diurnal temperatures. It would also avoid climatic conditions during recovery that favor the onset of blister blight disease and will result in substantial savings on fungicide applications. Traditionally, rainfall has been the key climatic factor considered in determining the optimum time for pruning tea. This study demonstrates the importance of taking into account of the effect of all weather parameters (rainfall, maximum & minimum temperature, sunshine hours, relative humidity and wind velocity) in determining the optimum time for pruning of tea.

However, sufficient field information (degree of recovery, yield, pest and disease infestations under well managed field conditions) is necessary to confirm the suitability of new season proposed for pruning and effect any changes to the present recommendations of the Tea Research Institute of Sri Lanka.

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