

## BYRAM DROUGHT INDEX CALCULATION

In order to ensure that all centres calculate the Byram Drought Index the same way, the following sets down the standard procedure to follow.

A. Rainfall Reduction

- (i) Obtain the 24 hour rainfall up to 0800 hrs and multiply it by 4 to express it in points
- (ii) Subtract 20 pts. from this amount to give net rainfall. For rainfalls of less than 5mm (or 20 pts) the net rainfall is nil.
- (iii) Treat all 24 hour rainfalls as single events, so that 20 pts is taken from each 24 hour rainfall to give net rainfall.

NB. Successive falls are NOT accumulated.

- (iv) Subtract net rainfall (pts) from yesterday's drought index to give the rainfall corrected drought index.

Example If yeaterday's drought index was 150, and 8mm rainfall was recorded up to 0800 hrs, then the net rainfall is  $8 \times 4 - 20 = 32 - 20 = 12$ , and the drought index is reduced thus:  $150 - 12 = 138$ .

B. Drying Increase

- (i) Obtain the dry bulb temperature (degrees C) to-day, using either 3 p.m. observations or the maximum temperature.
- (ii) Enter the Fuel State Factor Table with the maximum temp. and Drought Index yesterday, or the rainfall corrected drought index as outlined above. The value readoff is the fuel state factor.
- (iii) Add the fuel state factor to the rainfall-corrected drought index to give to-day's Drought Index.

Example To-day's max. temp. =  $28^{\circ}\text{C}$ , and the rainfall corrected drought index = 138.  
From the table, the fuel state factor is 8.  
Thus, to-day's Drought Index is  $138 + 8 = 146$

R. Sneeuwjagt  
Fire Research Officer

November 1976

**FUEL STATE FACTOR TABLE**  
(Annual rainfall 25" or more)

| Maximum<br>Temp.<br>°C(2) | Drought Index Yesterday (or as reduced by precipitation (1) ) |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |     |
|---------------------------|---|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----|
|                           | 6<br>to<br>49   | 50<br>to<br>99 | 100<br>to<br>149 | 150<br>to<br>199 | 200<br>to<br>249 | 250<br>to<br>299 | 300<br>to<br>349 | 350<br>to<br>399 | 400<br>to<br>449 | 450<br>to<br>499 | 500<br>to<br>549 | 550<br>to<br>649 | 650<br>to<br>699 | 700<br>to<br>759 | 760<br>to<br>799 | 800 |
|                           | 42+   | 36             | 34               | 31               | 29               | 27               | 24               | 22               | 20               | 17               | 15               | 13               | 9                | 6                | 3                | 1   |
| 41                        | 32  | 29             | 27               | 25               | 23               | 21               | 19               | 17               | 15               | 13               | 11               | 8                | 5                | 3                | 1                | 0   |
| 40                        | 29  | 27             | 25               | 23               | 21               | 19               | 17               | 16               | 14               | 12               | 10               | 8                | 5                | 3                | 1                | 0   |
| 39                        | 26  | 24             | 23               | 21               | 19               | 18               | 16               | 14               | 12               | 11               | 9                | 7                | 4                | 2                | 1                | 0   |
| 38                        | 24  | 22             | 21               | 19               | 18               | 16               | 14               | 13               | 11               | 10               | 8                | 6                | 4                | 2                | 1                | 0   |
| 37                        | 22  | 20             | 19               | 18               | 16               | 15               | 13               | 12               | 10               | 9                | 8                | 6                | 3                | 2                | 1                | 0   |
| 36                        | 20  | 18             | 17               | 16               | 15               | 13               | 12               | 11               | 9                | 8                | 7                | 5                | 3                | 2                | 1                | 0   |
| 35                        | 18  | 17             | 16               | 14               | 13               | 12               | 11               | 10               | 9                | 8                | 6                | 5                | 3                | 2                | 1                | 0   |
| 34                        | 16  | 15             | 14               | 13               | 12               | 11               | 10               | 9                | 8                | 7                | 6                | 4                | 3                | 2                | 1                | 0   |
| 33                        | 15  | 14             | 13               | 12               | 11               | 10               | 9                | 8                | 7                | 6                | 5                | 4                | 2                | 1                | 1                | 0   |
| 32                        | 14  | 13             | 12               | 11               | 10               | 9                | 8                | 7                | 7                | 6                | 5                | 4                | 2                | 1                | 1                | 0   |
| 31                        | 12  | 11             | 11               | 10               | 9                | 8                | 7                | 7                | 6                | 5                | 4                | 3                | 2                | 1                | 1                | 0   |
| 30                        | 11  | 10             | 10               | 9                | 8                | 8                | 7                | 6                | 5                | 5                | 4                | 3                | 2                | 1                | 1                | 0   |
| 29                        | 10  | 9              | 9                | 8                | 7                | 7                | 6                | 5                | 5                | 4                | 3                | 3                | 2                | 1                | 0                | 0   |
| 28                        | 9   | 9              | 8                | 7                | 7                | 6                | 5                | 5                | 4                | 4                | 3                | 2                | 1                | 1                | 0                | 0   |
| 27                        | 9   | 8              | 7                | 7                | 6                | 6                | 5                | 5                | 4                | 4                | 3                | 2                | 1                | 1                | 0                | 0   |
| 26                        | 8   | 7              | 7                | 6                | 5                | 5                | 5                | 4                | 4                | 3                | 3                | 2                | 1                | 1                | 0                | 0   |
| 25                        | 7   | 7              | 6                | 6                | 5                | 5                | 4                | 4                | 3                | 3                | 2                | 2                | 1                | 1                | 0                | 0   |
| 24                        | 6   | 6              | 5                | 5                | 4                | 4                | 4                | 3                | 3                | 3                | 2                | 2                | 1                | 1                | 0                | 0   |
| 23                        | 5   | 5              | 5                | 4                | 4                | 3                | 3                | 3                | 2                | 2                | 2                | 1                | 1                | 1                | 0                | 0   |
| 22                        | 5   | 5              | 4                | 4                | 4                | 3                | 3                | 3                | 2                | 2                | 2                | 1                | 1                | 1                | 0                | 0   |
| 21                        | 4   | 4              | 4                | 3                | 3                | 3                | 3                | 2                | 2                | 2                | 1                | 1                | 1                | 1                | 0                | 0   |
| 20                        | 4   | 4              | 4                | 3                | 3                | 3                | 2                | 2                | 2                | 1                | 1                | 1                | 1                | 1                | 0                | 0   |
| 19                        | 3   | 3              | 3                | 3                | 2                | 2                | 2                | 2                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0   |
| 18                        | 3   | 3              | 3                | 2                | 2                | 2                | 2                | 1                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0   |
| 17                        | 3   | 3              | 3                | 2                | 2                | 2                | 2                | 1                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0   |
| 16                        | 2   | 2              | 2                | 2                | 2                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0                | 0   |
| 15                        | 2   | 2              | 2                | 2                | 2                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0                | 0   |
| 14                        | 2   | 2              | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0                | 0   |
| 13                        | 1   | 1              | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0                | 0                | 0   |
| 12                        | 1   | 1              | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0                | 0                | 0   |
| 11                        | 1   | 1              | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0                | 0                | 0   |
| 10                        | 1   | 1              | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 0                | 0                | 0                | 0                | 0   |

- 1) Drought Index number expresses moisture deficiency in hundredths of an inch. It is reduced one point for each one-hundredth inch of rain in excess of 0.20". Thus a 24-hour precipitation of 0.52" will reduce the fuel-state index 32 points.
- 2) Dry-bulb temperature (degrees C) to-day, using either 3 p.m. observations or the maximum temperature. Treat all 24-hour rainfall as single events, e.g. 0.20" is taken from each 24-hour rainfall to give net rainfall. Successive falls are not accumulated.