# Dry and Wet Spell Sequences for Crop Planning at Aurangabad District on Talukawise Basis- A Markov Chain Approach

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**ABSTRACT:** *In regions of erratic and scanty rainfall, it is important to know probability of dry and wet spell on weekly basis during growing season of crops. The probability of wet spell if coincides with the sensitive phenological stages, it may be detrimental to crop, on the other hand the dry period at ripening stage of the crop is somewhat beneficial. The variation in rainfall from agricultural management is much more important when considered on weekly basis. The analysis showed that the more chance of occurrence of dry spell at MW 22 followed by MW 41 in all talukas of Aurangabad district so care has to be taken that fertilizer application, hoeing and weeding should be avoided. Probability analysis of occurrence of dry and wet spell provides the relevant information for different intercultural operations and can be useful for farm planning. The data studied in the project revealed that, the probability of occurrence of 2 weeks dry spell was highest in MW 41 while the probability of occurrence of 4 weeks dry spell was highest in MW 42. So crops like maize can be sown dry which will be germinate just after the rains and can save the time of land preparation.*

***Key words:*** *crop planning, dry spell, Markov chain approach, wet spell.*

## INTRODUCTION

The agricultural production in India is mainly dependent on the vagaries of monsoon and would remain so in near future also. Indian monsoon is highly uncertain in behavior. Basically rainfall varies from east to west while temperature varies from South to North. Thus, highly variable climate prevails in the country because of Himalayan ranges in North, Vindhyachal at the middle and Sahyadri in the West Coast. About 70 per cent of the total cultivable area of the country is rainfed. Hence, monsoon is an important season from Indian agricultural point of view. Prices of food grains, pulses, oilseeds etc. are also dependent on precipitation. The uncertainty of rainfall as well as its uneven distribution during the crop growth period affects the agricultural production adversely. In regions of erratic and scanty rainfall, it is important to know probability of dry and wet spell on weekly basis during growing season of crops. The probability of wet spell if coincides with the sensitive phonological stages, it may be detrimental to crop, on the other hand the dry period at ripening stage of the crop is somewhat beneficial. The variation in rainfall from agricultural management is much more important when considered on weekly basis. Marathwada region of Maharashtra state comprises of eight districts, lying geographically between $17^0$ 35′ to $20^0$ 40′ N latitude and $74^0$ 40′ to $78^0$ 16′ E longitude.

The climate of Marathwada experiences wide inter district and intra district variability. The monsoon commences from June and terminates at September end. Around 88 per cent of annual rainfall is concentrated in these months. Aurangabad district of Marathwada region of Maharashtra state comprising of nine (9) tahsils and 1368 villages. Total geographical area of the district is 10,10,700 ha. (10,107 sq.km). The tahsils located in Aurangabad district are Aurangabad, Khultabad, Gangapur, Kannad, Sillod, Soygaon, Paithan, Phulambri and Vaijapur. Geographically the districts lies between $19^0$ to $20^0$ N Latitude and $74^0$ to $76^0$ E longitudes in the Deccan plateau Zone. The Godavari is the main river flowing west to east. So also Purna, Shivana, Khelna, Kham, Dhudhana, Giraja etc. are the sub rivers flowing in the district. The districts falls within the two agro-

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climatic Zones, six talukas or their major parts come under the Central Maharashtra Plateau Zone, comprising of Aurangabad, Khultabad, Kannad, Sillod and Soygaon talukas. Three talukas viz., Paithan, Gangapur and Vaijapur belongs to Western Maharashtra dry or Scarcity Zone. The crops are taken in three seasons in a year viz., *kharif, rabi* and *summer*. The Cotton (13%), Cereals (35%), Pulses (9%), Oil seeds (5%) and Sugarcane (2%). Dry land fruit crops are also grown in some isolated pockets of the district. The south west monsoon advances in serge's and rain occurrence in one after the other shower. This activity continues during rainy season. However sometimes there is break in monsoon activity and vagaries of monsoon have been experienced as dry spell.

A break in the occurrence of rainfall during crop growing period which affects the crop growth and ultimately the yield is called as a dry spell. It may be of any duration ranging from 2 days to more than 20 days and even in some events it is 30 days. During this period the crop survives till soil is sufficiently wet to meet the evaporative demand of atmosphere. However, extended dry period adversely affects the crop growth and the plant starts showing wilting symptoms. The probability analysis of occurrence of dry and wet spell is essentially required for successful crop planning, development of suitable agro techniques, recommendation of suitable crop varieties, design of water harvesting structures and other soil conservation structures. Hence, the present investigation was carried out to evaluate the dry and wet spell sequences for crop planning for Aurangabad district.

## MATERIAL AND METHODS

The weekly rainfall probabilities has been found suitable to describe the long term frequency behavior of dry and wet spell of a particular region and can be used in the crop planning. The daily data collected for each taluka were summed up on meteorological weekly monthly, seasonal and annual basis. For calculation of meteorological weekly basis, the year was partitioned as per meteorological calendar, starting from 1st January of each year and ending on 31st December of the same year. The historical daily data of rainfall at each taluka of Aurangabad district were collected from Collectorate, Aurangabad, Department of Agricultural Meteorology, College of Agriculture, Parbhani. National Agriculture Research Project (NARP), Paithan Road, Aurangabad, and Water and Land Management Institute (WALMI) Aurangabad. However daily rainfall data for Aurangabad, Khultabad, Gangapur, Kannad, Sillod, Soygaon, Paithan, Vaijapur were available for last 30 years which were used for further analysis and the result to that affect are presented and discussed in this paper. A week receiving 20mm or more of rainfall is considered as wet and 20 mm less then dry week.

## Probability Analysis

Formulae for initial and conditional probabilities:
### I.   Initial rainfall probability (%) W

$W_x$  =  Initial rainfall probability of getting >20 mm rainfall x in week

Number of years during which > 20 mm rainfall in x week

$$W_x = \frac{\text{Number of years during which} > 20 \text{ mm rainfall in x week}}{\text{Total number of years}} \times 100$$

### II.   Conditional rainfall probabilities (%) (W/W):

Conditional rainfall probability (%) of getting 20 mm rainfall during next week and also there was rainfall >20 mm during this week (x).

$$W_x = \frac{\begin{array}{l}\text{Number of years during which next week received} \\ \text{>20 mm rainfall when this week also received} \\ \text{> 20 mm rainfall}\end{array}}{\begin{array}{l}\text{Number of years during which this week (Wx)} \\ \text{received >20 mm rainfall}\end{array}}$$

### III. Conditional rainfall probabilities (%) (W/D)

Conditional rainfall probability (W/D) of getting 20 mm rainfall during next week and this week was dry i.e. the rainfall was <20 mm.

$$W_x = \frac{\begin{array}{l}\text{Number of years during which next week received} \\ \text{>20 mm rainfall when this week (x) received} \\ \text{< 20 mm rainfall}\end{array}}{\begin{array}{l}\text{Number of years during which this week was dry} \\ \text{(<20 mm rainfall)}\end{array}}$$

## RESULTS AND DISCUSSION

On the basis of variability in annual total rainfall, each talukas (from normal) were categorized as deficit, moderate deficit, normal, moderate surplus and surplus year and the frequencies of the year grouped under each category are presented in (Table 1). The

**Table 1**
**Talukawise frequencies distribution of annual total rainfall in Aurangabad district.**

(Data base: 1979-2008)

| Categeory | Talukas A.bad | K.bad | G.pur | Kannad | Sillod | Soygaon | Paithan | Vaijapur |
|---|---|---|---|---|---|---|---|---|
| Deficit | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Moderate deficit | 1 | 3 | 11 | 4 | 4 | 5 | 3 | 6 |
| Normal | 23 | 23 | 24 | 21 | 22 | 20 | 20 | 17 |
| Moderate Surplus | 2 | 4 | 2 | 2 | 3 | 5 | 6 | 7 |
| Surplus | 2 | 0 | 1 | 3 | 0 | 0 | 1 | 0 |
| Total Years | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

data indicated that out of 30 year (normal year) ranged from 17-24 showing the inter taluka variation. The frequency of deficit year is higher in Aurangabad taluka as compared to other talukas. Out of 30 years surplus years ranged between 0-3 while deficit years range in 0-2.

The probability of dry spell and wet spell at each taluka was calculated for 05, 10 and 15 mm rainfall per week during rainy season. The data revealed that the probability of dry spell (Table-1a and 1b) for 05mm, 10mm and 15mm rainfall was decreases from MW 23. Highest probability of dry spell is in MW 22 followed by MW 41 in all taluka.

The data presented in Table 1a and 1b revealed that probability of occurrence of 2 weeks dry spell was highest in MW 41 in all talukas while probability of wet spell is highest in MW 29 in Aurangabad, Khultabad and Sillod talukas, MW 38 for Gangapur, Paithan and Vaijapur, MW 31 for Kannad and Soygaon.

The probability of occurrence of 3 weeks dry spell was highest in MW 41 in all talukas. while probability of wet spell is highest in MW 37 in Gangapur, Paithan and Vaijapur talukas, MW 30 for Aurangabad, Khultabad and Soygaon talukas, MW 27 for Kannad and for Sillod MW 28.

The probability of occurrence of 4 weeks dry spell was highest in MW 41 in all talukas while probability of wet spell is highest in MW 29 in Aurangabad, Khultabad, Sillod and Soygaon talukas, MW 36 for Gangapur and Vaijapur talukas, MW 26 & 37 for Kannad & Paithan respectively. This indicates that with increase in number of weeks the probability of wet spell was decreases.

The highest probability of occurrence of wet spell (Table 3) in Aurangabad at probability limits 5, 10, 15 mm was in MW 30, 22, 32 respectively. In Khultabad it is in MW 32, 30, 30. In Gangapur it is in MW 24, 39, 39. In Kannad it is in MW 32 for all limits. In Sillod it is at MW 32, 31, 31. For Soygaon it is at MW 33 for all limits. For Paithan it is in MW 24, 39, 39 while in

Vaijapur it is at MW 24, 38, 38. so care has to be taken that fertilizer application, hoeing and weeding should be avoided at 44 and 45 MW for conserving the soil moisture. Various workers (Victor *et al* 1979; Khichar *et al.,* 1991) also used the Markov chain model for computing the probability of rainfall for their respective regions.

Superimposing the crop calendar to the dry and wet spell sequences reflects the important crop management information. During the 4th MW the wheat crop is in the jointing stage which falls in the end of Jan. This period expected to be dry. So the irrigation should be applied for the purpose of preventing the crop from frost damage. The same work is carried out by Singh *et al.,* (2004) at Bathinda, Punjab and concluded that the probability of wet and dry spell coincide with sensitive phenological and reproductive stages of crop, which is detrimental for crop growth.

## CONCLUSION

The probability analysis of dry and wet spell is very useful tool for planning and management of crops in region of scanty rainfall. It provides an Insight of crop water status when crop phonological calendar superimposed over sequence of dry and wet spells. Insect Pest incidence can also be predicted by the sequence of wet and dry spell during the growing season.

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**Table 1a**
**Probability of occurrence of rainfall (mm) at each taluka of Aurangabad district during rainy season at the probability limit at 05, 10, 15 mm rainfall.(Dry spell)**

**(Data base 1979-2008)**

| WkNo. | Aurangabad | | | Khultabad | | | Gangapur | | | Paithan | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| 22 | .7667 | .8667 | .9000 | .7333 | .8000 | .8667 | .8000 | .8667 | .9000 | .8333 | .8667 | .8667 |
| 23 | .3667 | .5000 | .5333 | .3333 | .3667 | .4000 | .4000 | .6000 | .6333 | .4000 | .4667 | .5000 |
| 24 | .1000 | .1333 | .3000 | .1333 | .3333 | .4000 | .1333 | .2333 | .3333 | .1333 | .3333 | .4000 |
| 25 | .3333 | .4000 | .5000 | .2667 | .3333 | .3667 | .3333 | .4333 | .6000 | .5000 | .6000 | .6667 |
| 26 | .2333 | .2667 | .4000 | .2000 | .2333 | .3667 | .4000 | .4667 | .5333 | .4000 | .5000 | .6000 |
| 27 | .2333 | .3333 | .4000 | .2333 | .2667 | .4000 | .3000 | .4667 | .5333 | .2333 | .3333 | .4667 |
| 28 | .2000 | .3667 | .4333 | .0333 | .2667 | .3667 | .3333 | .4333 | .6000 | .3667 | .5333 | .6333 |
| 29 | .1333 | .2333 | .3000 | .0333 | .2333 | .3000 | .2333 | .4000 | .5333 | .3000 | .4333 | .4667 |
| 30 | .0333 | .1667 | .2333 | .1000 | .1333 | .1667 | .2333 | .3333 | .4000 | .2667 | .3667 | .4000 |
| 31 | .2667 | .2667 | .4000 | .1333 | .2333 | .3667 | .4333 | .5000 | .5667 | .2667 | .5000 | .6000 |
| 32 | .0667 | .1333 | .2000 | .0000 | .1667 | .2667 | .1667 | .3667 | .5000 | .3000 | .4333 | .4667 |
| 33 | .2667 | .3333 | .4333 | .2000 | .3000 | .4333 | .4000 | .6000 | .7000 | .3667 | .5000 | .6333 |
| 34 | .3000 | .3333 | .4667 | .2667 | .3667 | .4000 | .3000 | .3667 | .4000 | .3333 | .4333 | .5333 |
| 35 | .3000 | .4000 | .4333 | .2000 | .3667 | .4333 | .4000 | .5000 | .5333 | .4000 | .5333 | .6333 |
| 36 | .2667 | .3667 | .4333 | .1667 | .2667 | .3667 | .3000 | .4333 | .4667 | .3333 | .4667 | .4667 |
| 37 | .3333 | .4000 | .4333 | .2333 | .3000 | .4667 | .4000 | .4000 | .4000 | .3333 | .3667 | .4333 |
| 38 | .3000 | .3000 | .3667 | .2000 | .2000 | .2333 | .3667 | .3667 | .3667 | .3333 | .3667 | .3667 |
| 39 | .2667 | .2667 | .3000 | .2333 | .3000 | .4000 | .1667 | .1667 | .2333 | .2667 | .3333 | .3333 |
| 40 | .5000 | .5667 | .6000 | .5667 | .6667 | .7333 | .4333 | .5333 | .6000 | .5000 | .5667 | .5667 |
| 41 | .7333 | .7667 | .7667 | .6000 | .7000 | .8000 | .7000 | .7667 | .8000 | .7000 | .7667 | .8000 |

**Table 1b**
**Probability of occurrence of rainfall (mm) at each taluka of Aurangabad district during rainy season at the probability limit at 05, 10, 15 mm rainfall.(Dry spell)**

**(Data base 1979-2008)**

| WkNo. | Kannad | | | Sillod | | | Soygaon | | | Vaijapur | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| 22 | .8667 | .8667 | .8667 | .8333 | .8667 | .9000 | .8667 | .9000 | .9333 | .8333 | .8667 | .9333 |
| 23 | .3667 | .5667 | .6333 | .4333 | .6333 | .7000 | .6000 | .6667 | .6667 | .5333 | .6000 | .6000 |
| 24 | .2000 | .4000 | .4667 | .1333 | .3000 | .3667 | .2000 | .2667 | .3000 | .2000 | .3333 | .4333 |
| 25 | .4000 | .4333 | .5667 | .4000 | .5333 | .5333 | .3667 | .4333 | .5333 | .4000 | .5000 | .5333 |
| 26 | .3000 | .4000 | .4667 | .1667 | .3000 | .4000 | .1667 | .3333 | .3667 | .4333 | .5667 | .5667 |
| 27 | .1667 | .2333 | .3333 | .3000 | .4000 | .5000 | .2667 | .3333 | .3667 | .3667 | .5333 | .5667 |
| 28 | .1667 | .3333 | .4333 | .2000 | .3000 | .3667 | .2333 | .2667 | .4000 | .4667 | .4667 | .5333 |
| 29 | .2333 | .3333 | .4000 | .1333 | .2667 | .3000 | .0667 | .1667 | .2667 | .2333 | .3667 | .5333 |
| 30 | .2000 | .3333 | .4333 | .1333 | .1667 | .2333 | .0333 | .1000 | .2000 | .2000 | .4000 | .4333 |
| 31 | .2000 | .3333 | .4333 | .2333 | .3333 | .4333 | .1667 | .1667 | .2000 | .3333 | .4000 | .5000 |
| 32 | .1000 | .2333 | .3000 | .1333 | .2333 | .3667 | .0333 | .1000 | .1333 | .2333 | .4000 | .5667 |
| 33 | .2333 | .4333 | .5667 | .2000 | .4333 | .4333 | .1333 | .3333 | .3667 | .5000 | .6000 | .7333 |
| 34 | .2333 | .3667 | .5000 | .3000 | .3000 | .4000 | .2000 | .2667 | .3000 | .4667 | .5333 | .6667 |
| 35 | .3000 | .4333 | .5333 | .3000 | .4333 | .5000 | .3333 | .4000 | .5333 | .5333 | .6000 | .6667 |
| 36 | .3333 | .3667 | .4333 | .3000 | .4000 | .4667 | .2333 | .3667 | .4333 | .4667 | .5667 | .6000 |
| 37 | .3667 | .4667 | .5667 | .4667 | .5667 | .6333 | .3333 | .5000 | .5333 | .3333 | .4000 | .4333 |
| 38 | .2667 | .3000 | .3333 | .3333 | .4333 | .4667 | .2667 | .3000 | .3333 | .3000 | .3000 | .3000 |
| 39 | .3667 | .4000 | .4333 | .4000 | .5000 | .6000 | .3667 | .4333 | .5000 | .3000 | .3667 | .4333 |
| 40 | .4333 | .5333 | .6000 | .5667 | .6333 | .7000 | .5667 | .6000 | .63333 | .4667 | .5667 | .6333 |
| 41 | .7000 | .7667 | .8000 | .5667 | .6667 | .7667 | .6000 | .7667 | .7667 | .7000 | .7333 | .7667 |

**Table 2a**
**Probability of occurrence of rainfall (mm) at each taluka of Aurangabad district during rainy season at the probability limit at 05, 10, 15 mm rainfall. (Wet spell).**

(Data base 1979-2008)

| WkNo. | Aurangabad | | | Khultabad | | | Gangapur | | | Paithan | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| 22 | .2333 | 1.333 | .100 | .2667 | .2000 | .1333 | .2000 | .1333 | .1000 | .1667 | .1333 | .1333 |
| 23 | .6333 | .5000 | .4667 | .6667 | .6333 | .6000 | .6000 | .4000 | .3667 | .6000 | .5333 | .5000 |
| 24 | .9000 | .8667 | .7000 | .8667 | .6667 | .6000 | .8667 | .7667 | .6667 | .8667 | .6667 | .6000 |
| 25 | .6667 | .6000 | .5000 | .7333 | .6667 | .6333 | .667 | .5667 | .4000 | .5000 | .4000 | .3333 |
| 26 | .7667 | .7333 | .6000 | .8000 | .7667 | .6333 | .6000 | .5333 | .4667 | .6000 | .5000 | .40000 |
| 27 | .7667 | .6667 | .6000 | .7667 | .7333 | .6000 | .7000 | .5333 | .4667 | .7667 | .6667 | .53333 |
| 28 | .8000 | .6333 | .5667 | .9667 | .7333 | .6333 | .6667 | .5667 | .4000 | .6333 | .4667 | .3667 |
| 29 | .8667 | .7667 | .7000 | .9667 | .7667 | .7000 | .7667 | .6000 | .4667 | .7000 | .5667 | .5333 |
| 30 | .9667 | .8333 | .7667 | .9000 | .8667 | .8333 | .7667 | .6667 | .6000 | .7333 | .6333 | .6000 |
| 31 | .7333 | .7333 | .6000 | .8667 | .7667 | .6333 | .5667 | .5000 | .4333 | .7333 | .5000 | .4000 |
| 32 | .9333 | .8667 | .8000 | 1.0000 | .8333 | .7333 | .8333 | .6333 | .5000 | .7000 | .5667 | .5333 |
| 33 | .7333 | .6667 | .5667 | .8000 | .7000 | .5667 | .6000 | .4000 | .3000 | .6333 | .5000 | .3667 |
| 34 | .7000 | .6667 | .5333 | .7333 | .6333 | .6000 | .7000 | .6333 | .6000 | .6667 | .5667 | .4667 |
| 35 | .7000 | .6000 | .5667 | .8000 | .6333 | .5667 | .6000 | .5000 | .4667 | .6000 | .4667 | .3667 |
| 36 | .7333 | .6333 | .5667 | .8333 | .7333 | .6333 | .7000 | .5667 | .5333 | .6667 | .5333 | .5333 |
| 37 | .6667 | .6000 | .5667 | .7667 | .7000 | .5333 | .6000 | .6000 | .6000 | .6667 | .6333 | .5667 |
| 38 | .7000 | .7000 | .6333 | .8000 | .8000 | .7667 | .6333 | .6333 | .6333 | .6667 | .6333 | .6333 |
| 39 | .7333 | .7333 | .7000 | .7667 | .7000 | .6000 | .8333 | .8333 | .7667 | .7333 | .6667 | .6667 |
| 40 | .5000 | .4333 | .4000 | .4333 | .3333 | .2667 | .5667 | .4667 | .4000 | .5000 | .4333 | .4333 |
| 41 | .2667 | .2333 | .2333 | .4000 | .3000 | .2000 | .3000 | .2333 | .2000 | .3000 | .2333 | .2000 |

**Table 2b**
**Probability of occurrence of rainfall (mm) at each taluka of Aurangabad district during rainy season at the probability limit at 05, 10, 15 mm rainfall.(Wet Spell)**

(Data base 1979-2008)

| WkNo. | Kannad | | | Sillod | | | Soygaon | | | Vaijapur | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 |
| 22 | .1333 | .1333 | .1333 | .1667 | .1333 | .1000 | .1333 | .1000 | .0667 | .1667 | .1333 | .0667 |
| 23 | .6333 | .4333 | .3667 | .5667 | .3667 | .3000 | .4000 | .3333 | .3333 | .4667 | .4000 | .4000 |
| 24 | .8000 | .6000 | .5333 | .8667 | .7000 | .6333 | .8000 | .7333 | .7000 | .8000 | .6667 | .5667 |
| 25 | .6000 | .5667 | .4333 | .6000 | .4667 | .4667 | .6333 | .5667 | .4667 | .6000 | .5000 | .4667 |
| 26 | .7000 | .6000 | .5333 | .8333 | .7000 | .6000 | .8333 | .6667 | .6333 | .5667 | .4333 | .4333 |
| 27 | .8333 | .7667 | .6667 | .7000 | .6000 | .5000 | .7333 | .6667 | .6333 | .6333 | .4667 | .4333 |
| 28 | .8333 | .6667 | .5667 | .8000 | .7000 | .6333 | .7667 | .7333 | .6000 | .5333 | .5333 | .4667 |
| 29 | .7667 | .6667 | .6000 | .8667 | .7333 | .7000 | .9333 | .8333 | .7333 | .7667 | .6333 | .4667 |
| 30 | .8000 | .6667 | .5667 | .8667 | .8333 | .7667 | .9667 | .9000 | .8000 | .8000 | .6000 | .5667 |
| 31 | .8000 | .6667 | .5667 | .7667 | .6667 | .5667 | .8333 | .8333 | .8000 | .6667 | .6000 | .5000 |
| 32 | .9000 | .7667 | .7000 | .8667 | .7667 | .6333 | .9667 | .9000 | .8667 | .7667 | .6000 | .4333 |
| 33 | .7667 | .5667 | .4333 | .8000 | .5667 | .5667 | .8667 | .6667 | .6333 | .5000 | .4000 | .2667 |
| 34 | .7667 | .6333 | .5000 | .7000 | .7000 | .6000 | .8000 | .7333 | .7000 | .5333 | .4667 | .3333 |
| 35 | .7000 | .5667 | .4667 | .7000 | .5667 | .5000 | .6667 | .6000 | .4667 | .4667 | .4000 | .3333 |
| 36 | .6667 | .6333 | .5667 | .7000 | .6000 | .5333 | .7667 | .6333 | .5667 | .5333 | .4333 | .4000 |
| 37 | .6333 | .5333 | .4333 | .5333 | .4333 | .3667 | .6667 | .5000 | .4667 | .6667 | .6000 | .5667 |
| 38 | .7333 | .7000 | .6667 | .6667 | .5667 | .5333 | .7333 | .7000 | .6667 | .7000 | .7000 | .7000 |
| 39 | .6333 | .6000 | .5667 | .6000 | .5000 | .4000 | .6333 | .5667 | .5000 | .7000 | .6333 | .5667 |
| 40 | .5667 | .4667 | .4000 | .4333 | .3667 | .3000 | .4333 | .4000 | .3667 | .5333 | .4333 | .3667 |
| 41 | .3000 | .2333 | .2000 | .4333 | .3333 | .2333 | .4000 | .2333 | .2333 | .3000 | .2667 | .2333 |