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A model of an annual training programme for a sprinter

Tudor Bompa

The author details a training model aimed at maximizing a sprinter's peak performance in major championship meetings. Using 1991 and the build-up to the III World Championships in Athletics as an example, he describes the 'cyclic' approach to competition selection, both for the single and double periodized year, and illustrates a proposed training schedule for the interim time between races in a cycle. Finally, he discusses the periodization of the key motor elements and sprint parameters, stressing the paramount importance of properly observed rest intervals.

Dr Tudor Bompa has been a consultant to Canada's top sprinters for more than 10 years. He has published several books on training, periodization and coaching; two of his articles have appeared in previous issues of NSA. He now teaches Physical Education at York University in Toronto, Canada.

1 Introduction

Higher levels of athletic performance are largely the result of increased sophistication in training methodology, particularly of more effective planning.

In an attempt to plan an athlete's programme for the following year, the coach creates a training model to be followed as closely as possible. The purpose of this model is to propose effective training activities, methods and techniques, as well as to select appropriate competitions in order to maximize an athlete's peak performance in a major championship. The model presented below uses a sprinter as a subject, describing the step-by-step methodology of producing the model.

2 The structure of the model

A model of an annual plan cannot be produced until the competitions appropriate to the individual athlete have been selected. Most of the competitions which comprise the IAAF's list of annual fixtures are attractive, but the coach has to select the ones that are best suited to the athlete's aims.

The method utilized for the selection of competitions is known as the 'cyclic' approach. Every second weekend the athlete competes in an important international meet. Such an approach is advantageous because the coach can make slight changes or refinements in the training programme

according to the feedback he receives from past races. This will promote ideal preparation for major competitions.

Figure 1.1 illustrates how the cyclic approach might have been employed for both indoor and outdoor competitions, including domestic meets, for an athlete preparing for the III World Championships in Athletics in Tokyo, 1991. Adjustments might have been required in order to accommodate selection requirements, such as participation in national championships.

The indoor races which might have been selected prior to the World Indoor Championships in Seville, Spain are as follows: 19 January, Oregon; 1 February, New York; 15 February, Los Angeles. For the outdoor season the following competitions would possibly have been chosen: 30 May, Seville; 9 June, Moscow; 23 June, Berlin; and 7 July, Oslo. A longer regeneration period might have been scheduled between the last competition in the cycle and the World Indoor Championships or the III World Championships for a single and double periodized year respectively. It is assumed that enough feedback would have been collected during and subsequent to the 'cycled' competitions, and that the remaining time would have been dedicated to training and refining all the necessary technical and physical elements prior to the main competition season of the year.

Figure 1.2 illustrates a possible training schedule for the interim time between two races in the cycle. The suggested load is expressed as a percentage of the maximum. It is obvious that both during and after races, which often have separate heats and finals, an athlete will become fatigued. Although he may undergo regeneration techniques such as massage, sauna and psychological relaxation, this is not sufficient to remove the fatigue completely from the system before high intensity training is resumed. Therefore, during the first two days of training (Tuesday and Wednesday) the proposed programme is very light in order to facili-

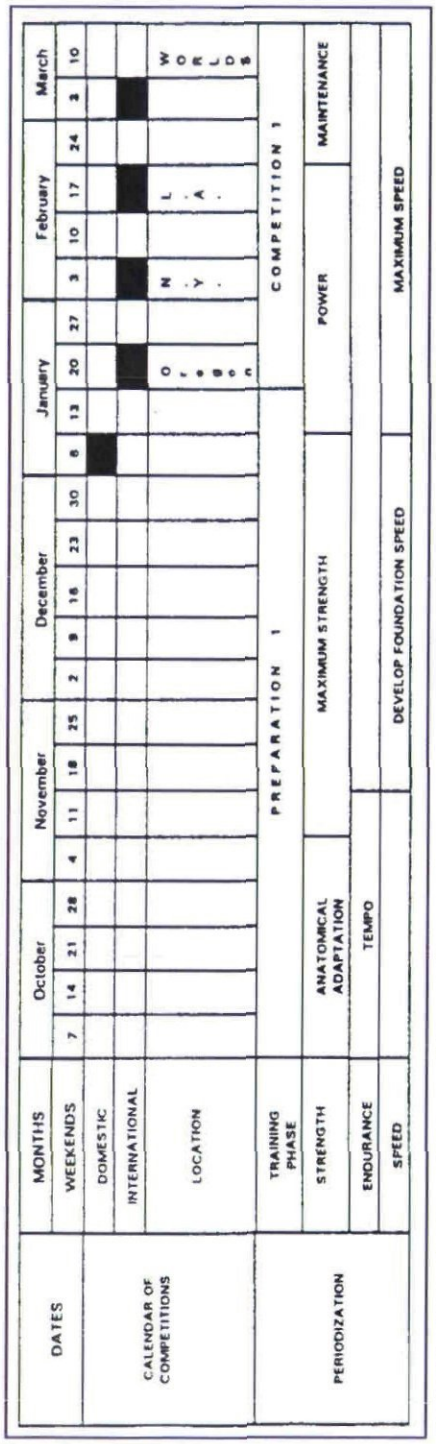

Figure 1.1: The cyclic approach to competition selection

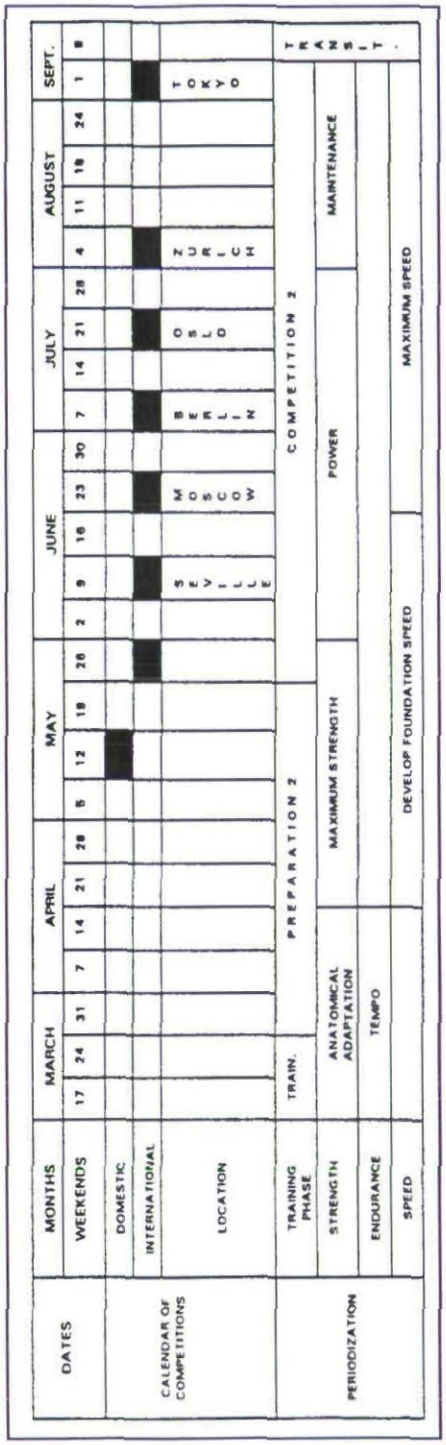

Figure 1.2: A proposed training schedule for the interim time between two races in the cycle

tate the recovery of the athlete prior to the introduction of heavier loads in the second part of the week. The duration of a training session, the velocity and the number of repetitions would be reduced, whilst the rest interval between work would be increased. Under these circumstances the athlete would be able to maintain his training load but also to allow his nervous system to rid itself of fatigue and biochemical wastes.

Training activities of higher intensity would be maintained in the latter part of the first microcycle and the early part of the second microcycle, with the highest peaks of intensity occurring on the Friday (first microcycle) and Wednesday (second microcycle). For the last 2-3 days prior to the race the coach would again reduce the training load in order to maximize the physiological and psychological benefits of overcompensation.

3 Periodization

Figure 2 (on the following page) makes specific suggestions as to how the model might have been divided into training phases. It illustrates especially how the main motor elements, such as strength, speed and endurance, might have been strucutured or periodized so that the athlete would be exposed to a training progression ultimately resulting in the highest possible level of performance at the World Championships.

The structure of the model represents a typical 'bi-cycle' or double periodized year, the first peak leading up to the World Indoor Championships in Seville.

The periodization of the key sprint parameters might have been modelled around the above structure. The periodization of strength might have started with an 'anatomical adaptation' phase, the scope of which would have aimed to involve most muscle groups and to prepare the ligaments, tendons and joints to support the stress of maximum muscular strength. During the adaptation phase, 9-12 exercises are pro-

posed, with 2-3 sets of 8-12 repetitions. The load should be 40-60 % of maximum, and the rest interval 2-3 min. During training the athlete should feel comfortable, and not be subjected to any pressure immediately to exceed past standards. This phase could last for 4-6 weeks, slightly longer for younger athletes.

The duration of the 'maximum strength' phase would have been six weeks, with the objective of increasing this type of strength work to the highest level possible. Exercises would have been selected in such a way that only the 'prime movers' (muscles directly involved in the running action) were activated. Therefore, a session of 5-6 exercises, 4-8 sets of 7-12 repetitions might have been scheduled here, with the load progressively increased from 70-100 %.

During the 'power' phase the maximum strength gained would have been converted into explosive, fast reactions. Exercises with a medicine ball, plyometrics, bounding exercises and weight training would predominate. For this type of training 5 exercises, 2-3 sets of 8-15 repetitions, might have been suggested, using a load of 50-80 % of maximum. The rest interval between sets would have been between 3 and 4 min.

Prior to the main competitions a 'maintenance' programme might have been introduced, power sessions predominating and performed once or twice a week following technical/speed work. The same approach might have been suggested for the second cycle leading up to the World Championships.

The 'periodization of endurance' would have been relatively simple, being organized prior to speed training and consisting of tempo work (repetitions of 400-600m). The objective would be to build an 'energy pool' which lasts for the entire cycle.

The 'periodization of speed' might have been organized into two phases. The first would develop the foundation of speed using specific exercises and speed work which aims at building the speed base. Maximum speed work would then have been possible in the second phase. Throughout these two phases speed training would have been developed progressively, starting with shorter distances (20-30m). When 'form' could be

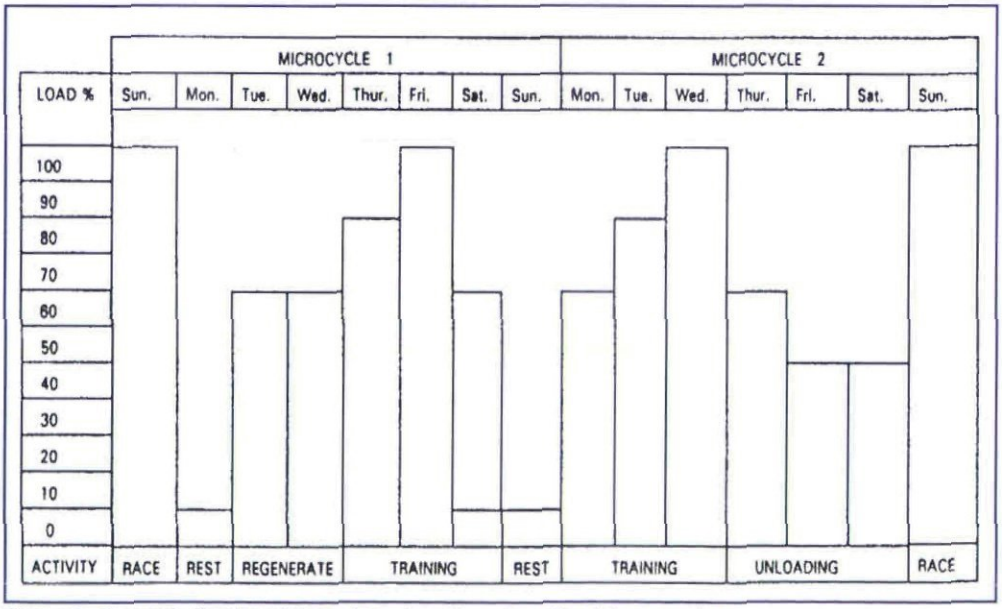

 Figure 2: The periodization of the main motor elements and sprint parameters

maintained at maximum velocity, the distance would have been progressively increased until the competitive distance was reached. At times over-distance work might have been used in training to develop speed endurance.

4 Conclusion

The process of producing a high quality sprinter is not simple or quick. Both athlete and coach require a high degree of patience.

Although periodization of training is of a relatively high complexity, its gradual and sequential implementation represents the best methodical guarantee of optimum performances during the latter part of a competitive phase.

The coach must learn which training methods are most suitable for each phase, as well as develop a high variety of exercises for each segment of strength periodization. Adherence to the suggested rest interval is essential. One should not disregard the fact that maximum strength, power and maximum speed training involve not only certain energy systems, but above all tax the neuromuscular system. The contribution of the nervous system is of paramount importance. Since fatigue is the outcome of training, and since fatigue impairs the activity of the central nervous system - which is vital to speed training - long rest intervals (of 5 min. and more) are crucial. These must take place not only between repetitions in speed training, but also after each set in strength training sessions. The rest interval must be properly observed if one expects good results in sprinting. Short cuts are not acceptable: they will often result in shortcomings.

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