

Wait, wait, wait ... rotate !

Being asked about the right time the caster should rotate the fly rod I don't have to think long. My answer will be that the rotation should be strongly delayed. This holds true for longer fly casts, but I personally prefer a later rotation even for medium fly casts. I'm convinced that on the one hand a later rotation is a good medicine to avoid a lot of casting faults and on the other hand it benefits an efficient, power minimized fly cast.

To understand this context a closer look on the effects is useful. Looking on some fly casting videos of me and other casters it can be observed that the deflection of the fly rod tends to be bigger and deeper the later the fly rod is rotated. This deflection causes basically a significant

- a) shortening of the lever arm (projection of the fly rod),
- b) storing of some energy (potential 'spring' energy) as well as
- c) redistribution of some energy into the tip of the fly rod (the angular momentum in association with the modification of the moment of inertia).

All enumerated effects interrelate in a complex way, but here I would like to focus on the relation between the lever arm (a) and the two further properties (b and c).

For the fly rod on the one end of the lever arm the tip is located, on the other end there is the grip. The lever arm property of the fly rod is vital for generating tip speed especially as it is rotated. The longer the lever arm is, the higher the tip speed could be. Tip speed is a kinetic energy which can be transferred from the grip. The more energy should be put into the tip, the more energy at the grip is needed. This is an advantage of the fly rod as for a stiff lever arm the ratio of the output and input energy (synonymous with efficiency) remains always unchanged as it works similar a 'plunger rod'.

For shorter lever arms the tip speed, tip energy respectively will decrease as well as the introduced energy at the grip. But in terms of the fly rod the shortening of the lever arm is accompanied by the deflection, which means that the two further properties (b and c) are correlated ! As shown in my ["Experimental investigations on the fly rod deflection"](#) (rev. 2.0, 11/2014) on the one hand the shortened lever arm might cause a reduced tip speed (see section F3), but coincidentally on the other hand the effort the caster has to apply decreases significantly and the tip gains additional speed upon rotation of the fly rod by efficient redistribution of energy.

Up to a limit, which is basically determined by the softness of the fly rod, the disadvantage of the initially decreasing tip speed will be significant smaller than the advantage both the storing and the redistribution of energy are providing ! So what the caster could gain is a much higher **efficiency** (ratio of the output and input energy) by 'loosing' a bit **effectiveness** (output energy, the tip speed is all what counts).

Caster who generate a smaller deflection are getting a longer lever arm. That might be useful especially in situations where effectiveness could be the key for success, e.g. tournament distance casting. They often prefer to rotate earlier or 'through the casting stroke'. So in terms to their aim those casters 'rotate at the right time' too.

For the common fishing situations my aim is to cast as efficient as possible. Hence to me 'Wait, wait, wait ... rotate' is a good phrasing to clarify the right time the rotation should take place.

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